APPENDIX 1

Playlist status for userID 6474126:
newRatingsCount: 0
moodID: 0
djID: 6474126
songsRemaining: 50
mediaType: 212
generating because forceRefresh is on
regenerating playlist with parameters: userID=6474126, bandwidth=28.8k, moodID=0, djID=6474126<PRE>
start of createPlaylist

0.0 lap time, 0.0 total
---

starting gathering threads at

0.0 lap time, 0.0 total

GetLastPlayed loaded 618 dates
getSubscriptions done

0.063 lap time, 0.063 total

All threads started

0.0 lap time, 0.063 total
---

getPopular done

0.047 lap time, 0.11 total
---

getRandom done (picked 5000 songs)

1.281 lap time, 1.391 total
---

genres for mood 0:64, 44, 46, 48, 50, 45, 47, 49, 51, 63, 67, 1, 0, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 68, 69, 73, 74, 75, 76, 77, 78, 79, 80,
gatherMedia done

0.0 lap time, 1.391 total
---

scores calculated

0.156 lap time, 1.547 total
---

recently played albums and artists marked

0.0 lap time, 1.547 total

Of 6749 songs, these are the reasons for exclusion: 546 were already excluded, 349 were not encoded, 34 were played in the last 3 hours, 0 had explicit lyrics, 0 were not in mediaType 212, 1292 were not in their genres, 482 had an implicit rating of 0.
There are 4046 songs available for play
ordering...

0.0 lap time, 1.547 total
---

finished sorting vectors at

0.11 lap time, 1.657 total

Available: explicit songs: 388.0, implicit songs: 2334.0, unrated songs: 1324.0
Ratio: 20
Picking: explicit songs: 17, implicit songs: 23, unrated songs: 10, method = Unrated Ratio
start of pickSongs

0.0 lap time, 1.657 total
---

end of pickSongs

0.0 lap time, 1.657 total
---

picked news

0.0 lap time, 1.657 total
---

picked ads

0.015 lap time, 1.672 total
---

picked tips

0.0 lap time, 1.672 total
---

playlist has 50 songs
shuffling playlist...
end of createPlaylist

0.0 lap time, 1.672 total
---

starting to save playlist

0.016 lap time, 1.688 total
---

done saving playlist

0.031 lap time, 1.719 total

</PRE>
<PRE>

Playlist 0 for userID 6474126 (djID 6474126) in mood 0 with mediaType 212, pickCounts: explicit to pick: 17, implicit to pick: 23, unrated to pick: 10 has 50 songs:

37409 146690 1022473 1364151 Emitt Rhodes Listen, Listen: The Best Of Emitt Rhodes You're A Very Lovely Woman - The Merry-Go- Round)
37718 43307 1016600 385563 Madonna Erotica Erotica
45680 43305 1016600 385517 Madonna The Immaculate Collection Cherish
40237 98477 1025497 900407 Squeeze The Piccadilly Collection * Loving You Tonight
21825 132410 1027798 1212736 U2 The Best Of 1980-1990 [Limited] New Year's Day
37268 137097 1028125 1259519 Various Artists Made On Earth Untitled - Total Eclipse
8405 41860 1015576 372519 The Lightning Seeds Sense Sense
31547 91874 1015450 839523 Jackie Leven Forbidden Songs Of The Dying West Birds Leave Shadows
42209 100072 1028125 1407544 Various Artists Assemblage Vol. 1 Taksu - Lights in a Fat City
39401 105661 1005547 956525 Paula Cole This Fire * Tiger
52454 85650 1024526 778897 Carly Simon Clouds In My Coffee 1965-1995 [Box] Stuff That Dreams Are Made Of, The
53486 51128 1021142 458446 Pink Floyd Ummagumma Narrow Way Part 1, The - David Gilmour
17982 58282 1025027 526886 Social Distortion Prison Bound Backstreet Girl
22578 14393 1000398 123761 Bryan Adams So Far So Good Summer Of '69
6947 130669 1009757 1193855 Fun Lovin' Criminals 100% Columbian * Big Night Out
39632 113337 1028125 1011924 Various Artists Pure Moods Crockett's Theme - Jan Hammer
30674 93944 1028256 857682 The Verve Pipe Villains * Cattle
28189 61860 1026856 559756 They Might Be Giants They Might Be Giants Toddler Hiway
16788 23890 1005543 212417 Jude Cole Start The Car Right There Now
37247 137097 1028125 1259512 Various Artists Made On Earth Portnawack - Typhoon
28606 64190 1030389 578647 Vanilla Fudge Rock & Roll Windmills Of Your Mind, The - (original mix)
6299 118154 1005865 1062093 Cornershop When I Was Born For The 7th Time * Brimful Of Asha
29369 74082 1025801 673069 Sting Fields Of Gold: The Best Of Sting 1984-1994 They Dance Alone (Cueca Solo)
23334 148558 1026856 1386237 They Might Be Giants Miscellaneous T Kiss Me, Son Of God - (alternate version)
53363 50728 1021142 454344 Pink Floyd A Saucerful Of Secrets Let There Be More Light
50557 50901 1020983 455893 Tom Petty Into The Great Wide Open All Or Nothin'
42791 142342 1025039 1327416 Soft Cell Non-Stop Ecstatic Dancing Insecure Me
30719 95006 1021869 867248 R.E.M. New Adventures In Hi-Fi Wake-Up Bomb, The - (live)
42923 148836 1015285 1388605 Ben Lee Breathing Tornados * Cigarettes Will Kill You
39860 123837 1018539 1122003 Morcheeba Big Calm Friction
30644 93944 1028256 857672 The Verve Pipe Villains * Drive You Mild
31529 91874 1015450 839517 Jackie Leven Forbidden Songs Of The Dying West Working Alone/A Blessing
39320 92012 1028514 841099 Loudon Wainwright III Grown Man Human Cannonball
22344 143220 1000012 1331978 10,000 Maniacs The Earth Pressed Flat * [4/20] Hidden In My Heart
26698 47344 1018869 423656 Peter Murphy Should The World Fail To Fall Apart God Sends
21660 130952 1021402 1196259 Portishead PNYC * Strangers
26686 47344 1018869 423652 Peter Murphy Should The World Fail To Fall Apart Light Pours Out Of Me, The
39137 87489 1023065 798733 David Lee Roth The Best Lil' Ain't Enough, A
7646 145523 1030217 1352144 Buddy Holly 20th Century Masters:... [4/20] Maybe Baby
44144 25421 1006149 227025 Crosby, Stills & Nash CSN [Box] Southern Cross
21999 135883 1038686 1242702 The Hope Blister Smile's OK... Is Jesus Your Pal
39644 113337 1028125 1011928 Various Artists Pure Moods Theme From "Twin Peaks - Fire Walk With Me" - Angelo Badalamenti
50515 50895 1020983 455822 Tom Petty Full Moon Fever Face In The Crowd, A
40510 117098 1018623 1049778 Morrissey Maladjusted He Cried
31805 87741 1013181 801582 Jars Of Clay Jars Of Clay Like A Child
29384 74082 1025801 673074 Sting Fields Of Gold: The Best Of Sting 1984-1994 We'll Be Together - (previously unreleased version)
25621 36886 1012859 328927 INXS X Disappear
28039 60022 1025830 544499 The Stone Roses Second Coming Love Spreads
26269 41495 1015374 369132 Lemonheads Come On Feel The Lemonheads Into Your Arms
52466 85650 1024526 778868 Carly Simon Clouds In My Coffee 1965-1995 [Box] Better Not Tell Her

2 songs are by the artist Jackie Leven (1015450)
1 songs are by the artist Bryan Adams (1000398)

1 songs are by the artist Paula Cole (1005547)
1 songs are by the artist Soft Cell (1025039)
1 songs are by the artist Portishead (1021402)
2 songs are by the artist They Might Be Giants (1026856)
1 songs are by the artist Crosby, Stills & Nash (1006149)
1 songs are by the artist Vanilla Fudge (1030389)
1 songs are by the artist Jude Cole (1005543)
2 songs are by the artist Carly Simon (1024526)
2 songs are by the artist Peter Murphy (1018869)
1 songs are by the artist Social Distortion (1025027)
2 songs are by the artist The Verve Pipe (1028256)
2 songs are by the artist Tom Petty (1020983)
1 songs are by the artist The Stone Roses (1025830)
1 songs are by the artist Fun Lovin' Criminals (1009757)
1 songs are by the artist Morcheeba (1018539)
1 songs are by the artist R.E.M. (1021869)
1 songs are by the artist Jars Of Clay (1013181)
1 songs are by the artist Emitt Rhodes (1022473)
5 songs are by the artist Various Artists (1028125)
2 songs are by the artist Sting (1025801)
1 songs are by the artist Squeeze (1025497)
1 songs are by the artist Morrissey (1018623)
1 songs are by the artist David Lee Roth (1023065)
2 songs are by the artist Madonna (1016600)
1 songs are by the artist Ben Lee (1015285)
2 songs are by the artist Pink Floyd (1021142)
1 songs are by the artist INXS (1012859)
1 songs are by the artist Loudon Wainwright III (1028514)
1 songs are by the artist U2 (1027798)
1 songs are by the artist Lemonheads (1015374)
1 songs are by the artist The Lightning Seeds (1015576)
1 songs are by the artist Buddy Holly (1030217)
1 songs are by the artist 10,000 Maniacs (1000012)
1 songs are by the artist Cornershop (1005865)
1 songs are by the artist The Hope Blister (1038686)

1 songs are from the album The Best Of 1980-1990 [Limited] (132410)
1 songs are from the album Into The Great Wide Open (50901)
1 songs are from the album Full Moon Fever (50895)
1 songs are from the album Miscellaneous T (148558)
1 songs are from the album Come On Feel The Lemonheads (41495)
1 songs are from the album When I Was Born For The 7th Time * (118154)
1 songs are from the album 20th Century Masters:... [4/20] (145523)
1 songs are from the album Assemblage Vol. 1 (100072)
1 songs are from the album Erotica (43307)
1 songs are from the album The Immaculate Collection (43305)
2 songs are from the album Should The World Fail To Fall Apart (47344)
1 songs are from the album 100% Columbian * (130669)
1 songs are from the album Jars Of Clay (87741)
1 songs are from the album CSN [Box] (25421)
1 songs are from the album New Adventures In Hi-Fi (95006)
2 songs are from the album Forbidden Songs Of The Dying West (91874)
1 songs are from the album Breathing Tornados * (148836)
1 songs are from the album PNYC * (130952)
1 songs are from the album Rock & Roll (64190)
1 songs are from the album Start The Car (23890)
1 songs are from the album So Far So Good (14393)
2 songs are from the album Fields Of Gold: The Best Of Sting 1984-1994 (74082)
1 songs are from the album They Might Be Giants (61860)
1 songs are from the album Sense (41860)
2 songs are from the album Made On Earth (137097)

1 songs are from the album Maladjusted (117098)
1 songs are from the album Smile's OK... (135883)
1 songs are from the album Listen, Listen: The Best Of Emitt Rhodes (146690)
1 songs are from the album Non-Stop Ecstatic Dancing (142342)
1 songs are from the album Second Coming (60022)
1 songs are from the album A Saucerful Of Secrets (50728)
1 songs are from the album The Best (87489)
1 songs are from the album Ummagumma (51128)
1 songs are from the album X (36886)
2 songs are from the album Pure Moods (113337)
1 songs are from the album This Fire * (105661)
2 songs are from the album Villains * (93944)
1 songs are from the album Big Calm (123837)
1 songs are from the album Prison Bound (58282)
1 songs are from the album The Earth Pressed Flat * [4/20] (143220)
2 songs are from the album Clouds In My Coffee 1965-1995 [Box] (85650)
1 songs are from the album The Piccadilly Collection * (98477)
1 songs are from the album Grown Man (92012)

21 songs (42.0%) are from the random query
6 songs (12.0%) are from the pop query
6 songs (12.0%) are from the djs query
17 songs (34.0%) are from the rated query

3 songs (6.0%) originated from djAlb
11 songs (22.0%) originated from random
3 songs (6.0%) originated from djs
6 songs (12.0%) originated from s avg
3 songs (6.0%) originated from artist
7 songs (14.000000000000002%) originated from album
17 songs (34.0%) originated from rated

Percentile 0% - 20%: 40 (80%)
Percentile 20% - 40%: 2 (4%)
Percentile 40% - 60%: 2 (4%)
Percentile 60% - 80%: 4 (8%)
Percentile 80% - 100%: 2 (4%)

<P>
Item Ratings

Artist "The Cure" (1006316) user=0(Not Set) djs=50/1=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Artist "Liz Phair" (1020993) user=30 djs=70/1=70 songAverage=0/0=(Not calculated) songAvgScore=0.0
Artist "Freaky Chakra" (1009573) user=0(Not Set) djs=0/0=(Not calculated) songAverage=0/1=0 songAvgScore=39.0
Artist "Duncan Sheik" (1024246) user=0(Not Set) djs=0/0=(Not calculated) songAverage=80/1=80 songAvgScore=59.0
Artist "Tom Petty" (1020983) user=73 djs=20/1=20 songAverage=554/8=(Not calculated) songAvgScore=0.0
Album "Great Divide" (94571) user=0(Not Set) djs=70/1=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Album "Devil Without A Cause *" (127191) user=20 djs=0/0=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0

«entries omitted».

Artist "Iron City Houserockers" (1012883) user=0(Not Set) djs=0/0=(Not calculated) songAverage=0/2=0 songAvgScore=26.0
Album "Superunknown" (58747) user=0(Not Set) djs=70/1=70 songAverage=0/0=(Not calculated) songAvgScore=0.0

Artist "To Rococo Rot" (1032453) user=0 djs=0/0=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Album "(Not available)" (132141) user=0(Not Set) djs=80/1=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Album "Buckcherry" (143554) user=0(Not Set) djs=50/1=50 songAverage=0/0=(Not calculated) songAvgScore=0.0
Artist "Jamie Blake" (1030814) user=0(Not Set) djs=60/1=60 songAverage=0/0=(Not calculated) songAvgScore=0.0
Album "(Not available)" (45683) user=90 djs=0/0=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Album "(Not available)" (45676) user=90 djs=0/0=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Artist "INXS" (1012859) user=0(Not Set) djs=70/1=70 songAverage=69/2=35 songAvgScore=43.5
Artist "Kenny Wayne Shepherd" (1024272) user=0(Not Set) djs=0/0=(Not calculated) songAverage=0/1=(Not calculated) songAvgScore=0.0
Album "The Ghost Of Tom Joad" (89708) user=0(Not Set) djs=0/1=0 songAverage=0/0=(Not calculated) songAvgScore=0.0
Artist "(Not available)" (1001434) user=0(Not Set) djs=10/1=(Not calculated) songAverage=0/0=(Not calculated) songAvgScore=0.0
Explicitly Rated Songs

#	songID	query	origin	status	ord	score	lastP.	bds	impl.	rating(t)	djs	netP.
		comm	albumID	artisID	artist	title	album					
1	372519	rated	rated	P	5	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	46/0	41860	1015576	The Lightning Seeds			Sense	Sense	(14, 77,)	
2	385517	rated	rated	P	9	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	49/0	43305	1016600	Madonna		Cherish	The Immaculate Collection			
		(14, 28, 77,)										
3	673074	rated	rated	P	14	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	51/0	74082	1025801	Sting	We'll Be Together - (previously unreleased version)					
		Fields Of Gold: The Best Of Sting 1984-1994						(14, 77,)				
4	673069	rated	rated	P	18	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	44/0	74082	1025801	Sting	They Dance Alone (Cueca Solo)			Fields Of Gold:		
	The Best Of Sting 1984-1994				(14, 77,)							
5	123761	rated	rated	P	22	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	48/0	14393	1000398	Bryan Adams		Summer Of '69	So Far So Good	(13,		
	14, 23, 77,)											
6	1388605	rated	rated	P	19	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	55/0	148836	1015285	Ben Lee	Cigarettes Will Kill You		Breathing Tornados *			
		(14, 77,)										
7	1062093	rated	rated	P	29	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	57/0	118154	1005865	Cornershop		Brimful Of Asha	When I Was Born For			
	The 7th Time *	(14, 77,)										
8	867248	rated	rated	P	16	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	40/0	95006	1021869	R.E.M.	Wake-Up Bomb, The - (live)			New		
	Adventures In Hi-Fi			(14, 77,)								
9	227025	rated	rated	P	42	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	48/0	25421	1006149	Crosby, Stills & Nash		Southern Cross	CSN [Box]			
		(13, 14, 16, 24, 77,)										
10	857682	rated	rated	P	44	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	50/0	93944	1028256	The Verve Pipe	Cattle	Villains *		(14, 78,)		
11	1081855	rated	rated	N	-1	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	38/0	119843	1024639	Sixpence None The Richer			We Have Forgotten			
	Sixpence None The Richer *			(14, 77,)								
12	454986	rated	rated	N	-1	79	100/30	0/0	49	70/49	(1)	52/0
		52/0	46/0	50795	1020940	Pet Shop Boys	Heart	Discography - The Complete				
	Singles...			(14, 77,)								

13 455822 rated rated P 31 79 100/30 0/0 49 70/49 (1) 52/0
52/0 42/0 50895 1020983 Tom Petty Face In The Crowd, A Full Moon Fever (14, 77,)

14 664522 rated rated N -1 79 100/30 0/0 49 70/49 (1) 52/0
52/0 47/0 73173 1016600 Madonna Secret Bedtime Stories (7, 14, 24, 76, 77,)

15 990161 rated rated N -1 79 100/30 0/0 49 70/49 (1) 52/0
52/0 44/0 110565 1027386 Train Days Train (14, 77,)

16 544499 rated rated P 12 79 100/30 0/0 49 70/49 (1) 52/0
52/0 47/0 60022 1025830 The Stone Roses Love Spreads Second Coming (14, 77,)

17 857683 rated rated N -1 79 100/30 0/0 49 70/49 (1) 52/0
52/0 49/0 93944 1028256 The Verve Pipe Veneer Villains * (14, 78,)

18 990158 rated rated N -1 79 100/30 0/0 49 70/49 (1) 52/0
52/0 50/0 110565 1027386 Train Blind Train (14, 77,)

19 1119487 rated rated N -1 79 100/30 0/0 49 70/49 (1) 52/0
52/0 55/0 123589 1028125 Various Artists Block Rockin' Beats - The Chemical Brothers Digital Empire: Electronica's Best (14, 77,)

20 458446 rated rated P 33 79 100/30 0/0 49 70/49 (1) 52/0
52/0 37/0 51128 1021142 Pink Floyd Narrow Way Part 1, The - David Gilmour Ummagumma (14, 77,)

«entries omitted».

360 830167 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 49/0 90869 1016358 Lush Ladykillers Lovelife * (14, 77,)

#	songID	query comm	origin albumID	status artisID	ord artist	score title	lastP. album	bds	impl.	rating(t)	djs	netP.

361 345744 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 49/0 38706 1013691 Journey Faithfully Time Cubed [Box] (14, 77,)

362 1012355 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 45/0 113423 1023631 Savage Garden To The Moon & Back Savage Garden (14, 77,)

363 673063 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 47/0 74082 1025801 Sting When We Dance - (previously unreleased) Fields Of Gold: The Best Of Sting 1984-1994 (14, 77,)

364 1383771 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 46/0 148392 1021623 The Prodigy Smack My Bitch Up Fat Of The Land * (14, 77,)

365 499807 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 51/0 55333 1023239 Rush Tom Sawyer Chronicles (14, 77,)

366 1078501 rated rated N -1 42 0/0 0/0 42 60/42 (1) 52/0
52/0 35/0 119582 1015272 Led Zeppelin Thank You - (stereo) BBC Sessions * (14, 77,)

367 1327003 rated rated N -1 41 0/0 0/0 41 59/41 (1) 52/0
52/0 43/0 142307 1039472 Tommy Henriksen Dreaming In Colors Tommy Henriksen (14, 77,)

368 1212748 rated rated N -1 40 0/0 0/0 40 57/40 (1) 52/0
52/0 63/0 132410 1027798 U2 All I Want Is You The Best Of 1980-1990 [Limited] (14, 77,)

369 345875 rated random N -1 37 100/30 0/0 7 10/07 (1) 52/0
52/0 36/0 38717 1013699 Joy Of Cooking Three Day Loser American Originals (14, 77,)

370 1233646 rated random N -1 37 100/30 0/0 7 10/07 (1) 52/0
52/0 40/0 134584 1037731 Britney Spears Crazy, (You Drive Me) Baby One More Time... [ECD] (14, 77,)

371	573363	rated	random	N	-1	37	100/30	0/0	7	10/07 (1)	52/0
		52/0	40/0	63494	1027743	Twisted Sister		We're Not Gonna Take It		Big Hits And	
	Nasty Cuts-Best Of Twisted Sister (15, 16,)										
372	339153	rated	random	N	-1	37	100/30	0/0	7	10/07 (1)	52/0
		52/0	41/0	37973	1013350	Jethro Tull		Jeffrey Goes To Leicester Square			Stand
	Up	(14, 77,)									
373	1233649	rated	random	N	-1	37	100/30	0/0	7	10/07 (1)	52/0
		52/0	40/0	134584	1037731	Britney Spears		Born To Make You Happy		Baby One More	
	Time... [ECD]	(14, 77,)									
374	1411604	rated	random	N	-1	37	100/30	0/0	7	10/07 (1)	52/0
		52/0	43/0	50365	1020680	The Pastels		Baby Honey		Suck On The	
	Pastels...1983-1985		(14, 77,)								
375	870674	rated	random	N	-1	37	100/30	0/0	7	10/07 (1)	52/0
		52/0	43/0	95367	1021928	Rage Against The Machine				Year Of Tha Boomerang	
	Evil Empire *		(14, 77,)								
376	1233647	rated	random	N	-1	36	100/30	0/0	6	09/06 (1)	52/0
		52/0	23/0	134584	1037731	Britney Spears		Sometimes		Baby One More Time...	
	[ECD]	(14, 77,)									
377	990162	rated	rated	N	-1	35	0/0	0/0	35	50/35 (1)	52/0
		52/0	39/0	110565	1027386	Train	Rat	Train	(14, 77,)		
378	578086	rated	rated	N	-1	35	0/0	0/0	35	50/35 (1)	52/0
		52/0	49/0	64109	1028073	Van Halen		Top Of The World		For Unlawful	
	Carnal Knowledge		(14, 77,)								
379	948179	rated	rated	N	-1	35	0/0	0/0	35	50/35 (1)	52/0
		52/0	50/0	104678	1015374	Lemonheads		6ix	Car Button Cloth	(14, 77,)	
380	870670	rated	rated	N	-1	35	0/0	0/0	35	50/35 (1)	52/0
		52/0	42/0	95367	1021928	Rage Against The Machine			Down Rodeo		Evil
	Empire *		(14, 77,)								
381	1327649	rated	rated	N	-1	35	0/0	0/0	35	50/35 (1)	52/0
		52/0	55/0	142358	1003125	Blur	1992	13 [Limited Edition] *		(14, 77,)	
382	1164473	rated	random	N	-1	33	100/30	0/0	3	04/03 (1)	52/0
		52/0	40/0	127996	1017147	John Martyn		Glory Box		The Church With One	
	Bell *	(11,)									
383	1004142	rated	rated	N	-1	31	0/0	0/0	31	44/31 (1)	52/0
		52/0	50/0	112437	1020156	Original Soundtrack		Da Funk - Daft Punk			The
	Saint	(6,)									
384	1005941	rated	rated	N	-1	28	0/0	0/0	28	40/28 (1)	52/0
		52/0	29/0	112611	1011710	Heart	Stranded	These Dreams - Heart's Greatest Hits *			
	(14, 77,)										
385	531917	rated	rated	N	-1	28	0/0	0/0	28	40/28 (1)	52/0
		52/0	48/0	58747	1025213	Soundgarden		Fell On Black Days		Superunknown	
	(14, 77,)										
386	224547	rated	rated	N	-1	25	0/0	0/0	25	36/25 (1)	52/0
		52/0	45/0	25172	1006025	Crash Test Dummies		Untitled	God Shuffled His Feet		
	(14, 77,)										
387	991308	rated	random	N	-1	21	0/0	0/0	21	30/21 (1)	52/0
		52/0	41/0	110722	1009352	Foo Fighters		New Way Home	The Colour & The Shape		
	*	(14, 78,)									
388	531918	rated	random	N	-1	14	0/0	0/0	14	20/14 (1)	52/0
		52/0	44/0	58747	1025213	Soundgarden		Mailman		Superunknown	(14,
	77,)										

Implicitly Rated Songs

#	songID	query	origin	status	ord	score	lastP.	bds	impl.	rating(t)	djs	netP.
		comm	albumID	artisID	artist	title	album					
1	559756	random	album	P	6	65	100/20	0/0	45	95/43 (2)		10/1
		52/0	40/2	61860	1026856	They Might Be Giants		Toddler Hiway		They Might Be		
	Giants	(14, 77,)										

2 857672 random djAlb P 2 63 100/20 0/0 43 81/36 (2) 90/5
52/0 36/2 93944 1028256 The Verve Pipe Drive You Mild Villains * (14, 78,)
3 1212736 djs album P 10 61 100/20 0/0 41 80/36 (2) 50/3
52/0 53/3 132410 1027798 U2 New Year's Day The Best Of 1980-1990 [Limited] (14, 77,)
4 1212744 random album R -1 61 100/20 0/0 41 80/36 (2) 40/2
52/0 61/3 132410 1027798 U2 Sweetest Thing - (The Single mix) The Best Of 1980-1990 [Limited] (14, 77,)
5 778854 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 46/2 85650 1024526 Carly Simon Do The Walls Come Down Clouds In My Coffee 1965-1995 [Box] (14, 77,)
6 778868 random album P 8 61 100/20 0/0 41 80/36 (2) 52/3
52/0 46/2 85650 1024526 Carly Simon Better Not Tell Her Clouds In My Coffee 1965-1995 [Box] (14, 77,)
7 1089955 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 45/2 120604 1017716 John Mellencamp I Need A Lover The Best That I Could Do... (14, 77,)
8 1089962 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 45/2 120604 1017716 John Mellencamp Authority Song The Best That I Could Do... (14, 77,)
9 385512 random album R -1 61 100/20 0/0 41 80/36 (2) 50/3
52/0 47/2 43305 1016600 Madonna Papa Don't Preach The Immaculate Collection (14, 28, 77,)
10 778844 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 42/2 85650 1024526 Carly Simon Play With Me Clouds In My Coffee 1965-1995 [Box] (14, 77,)
11 778877 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 42/2 85650 1024526 Carly Simon Angel From Montgomery - (prev. unreleased) Clouds In My Coffee 1965-1995 [Box] (14, 77,)
12 778855 random album R -1 61 100/20 0/0 41 80/36 (2) 52/3
52/0 40/2 85650 1024526 Carly Simon Danny Boy Clouds In My Coffee 1965-1995 [Box] (14, 77,)
13 1212734 random album R -1 61 100/20 0/0 41 80/36 (2) 50/3
52/0 41/2 132410 1027798 U2 Trash, Trampoline And The Party Girl The Best Of 1980-1990 [Limited] (14, 77,)
14 778848 random album R -1 60 100/20 0/0 40 80/36 (2) 52/3
52/0 37/2 85650 1024526 Carly Simon Julie Through The Glass Clouds In My Coffee 1965-1995 [Box] (14, 77,)
15 385563 djs artist P 38 60 100/20 0/0 40 80/32 (3) 60/6
52/0 49/2 43307 1016600 Madonna Erotica Erotica (14, 77,)
16 778847 random album R -1 60 100/20 0/0 40 80/36 (2) 52/3
52/0 37/2 85650 1024526 Carly Simon Boys In The Trees Clouds In My Coffee 1965-1995 [Box] (14, 77,)
17 778894 random album R -1 60 100/20 0/0 40 80/36 (2) 52/3
52/0 37/2 85650 1024526 Carly Simon Nobody Does It Better Clouds In My Coffee 1965-1995 [Box] (14, 77,)
18 778890 random album R -1 60 100/20 0/0 40 80/36 (2) 52/3
52/0 37/2 85650 1024526 Carly Simon Why Clouds In My Coffee 1965-1995 [Box] (14, 77,)
19 778856 random album R -1 60 100/20 0/0 40 80/36 (2) 52/3
52/0 37/2 85650 1024526 Carly Simon Dink's Blues Clouds In My Coffee 1965-1995 [Box] (14, 77,)
20 1212752 djs album R -1 60 100/20 0/0 40 80/36 (2) 40/2
52/0 48/2 132410 1027798 U2 Love Comes Tumbling The Best Of 1980-1990 [Limited] (14, 77,)

«entries omitted».

2314	1411055	random	random	N	-1	23	100/20	0/0	3	00/00 (4)	0/0	
		52/0	50/3	111845	1026459	Tall Dwarfs		Crocodile		Stumpy *	(14, 77,)	
2315	434293	pop	djArt	N	-1	22	0/0	0/0	22	39/14 (4)	40/6	
		52/0	52/3	48566	1019512	Nine Inch Nails		Ruiner	The Downward Spiral		(14, 77,)	
2316	615943	pop	djArt	N	-1	22	0/0	0/0	22	39/14 (4)	40/6	
		52/0	52/3	68246	1022782	Tom Robinson		Winter Of '79, The		Power In The Darkness	(14, 77,)	
2317	1411059	djs	random	N	-1	22	100/20	0/0	2	00/00 (4)	0/0	
		52/0	42/2	111845	1026459	Tall Dwarfs		Jesus the Beast		Stumpy *	(14, 77,)	
2318	1411054	djs	random	N	-1	22	100/20	0/0	2	00/00 (4)	0/0	
		52/0	40/2	111845	1026459	Tall Dwarfs		The Severed Head of Julio		Stumpy *	(14, 77,)	
2319	1411069	random	random	N	-1	22	100/20	0/0	2	00/00 (4)	0/0	
		52/0	40/2	111845	1026459	Tall Dwarfs		Dessicated		Stumpy *	(14, 77,)	
2320	1411070	djs	random	N	-1	22	100/20	0/0	2	00/00 (4)	0/0	
		52/0	40/2	111845	1026459	Tall Dwarfs		Two Minds		Stumpy *	(14, 77,)	

#	songID	query comm	origin albumID	status artisID	ord artist	score title	lastP. album	bds	impl.	rating(t)	djs	netP.
2321	931183	djs	s avg	N	-1	19	0/0	0/0	19	39/14 (4)		25/4
		52/0	37/2	102305	1012081	Robyn Hitchcock		Yip Song, The		Greatest Hits		(14, 77,)
2322	560002	random	random	N	-1	19	0/0	0/0	19	26/09 (4)		52/8
		52/0	47/2	61888	1026872	Thin Lizzy		Killer On The Loose		Life Live		(14, 16, 77,)
2323	1125549	random	artist	N	-1	19	0/0	0/0	19	40/16 (3)		10/1
		52/0	40/2	124176	1023542	Santana	Bella	Best Of Santana (Legacy) *				(14, 77,)
2324	328929	random	s avg	N	-1	19	0/0	0/0	19	43/15 (4)		10/2
		52/0	41/2	36886	1012859	INXS	Faith In Each Other			X	(14, 77,)	
2325	1073535	djs	s avg	N	-1	18	0/0	0/0	18	46/16 (4)		0/0
		52/0	46/2	119192	1021186	The Pixies		Gouge Away		Death To The Pixies		(14, 77,)
2326	1064098	random	djs	N	-1	18	0/0	0/0	18	26/09 (4)		40/6
		52/0	52/3	118335	1030720	Apollo Four Forty		Ain't Talkin' 'Bout Dub				Electro Glide In Blue (14, 43,)
2327	651483	random	s avg	N	-1	18	0/0	0/0	18	39/14 (4)		10/2
		52/0	47/2	72015	1014381	Carole King		Where You Lead		A Natural Woman: The Ode... [Box]		(14, 77,)
2328	829989	random	s avg	N	-1	17	0/0	0/0	17	39/14 (4)		10/2
		52/0	46/2	90854	1013280	Jefferson Airplane		Crazy Miranda		Bark		(14, 77,)
2329	553197	djs	s avg	N	-1	17	0/0	0/0	17	39/14 (4)		10/2
		52/0	44/2	61087	1026455	Talk Talk		Renee	It's My Life		(14, 77,)	
2330	651476	djs	s avg	N	-1	17	0/0	0/0	17	39/14 (4)		10/2
		52/0	41/2	72015	1014381	Carole King		I Feel The Earth Move		A Natural Woman: The Ode... [Box]		(14, 77,)
2331	504343	djs	s avg	N	-1	15	0/0	0/0	15	39/14 (4)		0/0
		52/0	34/2	55865	1023614	Joe Satriani		Summer Song		The Extremist		(14, 77,)
2332	355176	random	random	N	-1	9	0/0	0/0	9	15/05 (4)		10/2
		52/0	47/2	39927	1014426	The Kinks		Most Exclusive Residence For Sale - (mono)				Face To Face (14, 77,)
2333	1233652	djs	djs	N	-1	8	0/0	0/0	8	09/04 (2)		40/2
		52/0	41/2	134584	1037731	Britney Spears		I Will Still Love You - (with Don Philip)				Baby One More Time... [ECD] (14, 77,)

2334	958836	random	random	N	-1	7	0/0	0/0	7	09/03 (4)		10/2
		52/0	37/2	105851	1029091	The Who		I Don't Even Know Myself				Live
	At The Isle Of Wight Festival 1970 *				(14, 77,)							

Unrated Songs

#	songID	query comm	origin albumID	status artisID	ord artist	score title	lastP. album	bds	impl.	rating(t) djs	netP.
1	1011924	random	djAlb	P	7	54	100/25	0/0	29	52/00 (0)	73/24
		52/0	46/5	113337	1028125	Various Artists		Crockett's Theme - Jan Hammer			Pure
	Moods (10,)										
2	1011928	random	djAlb	P	11	53	100/25	0/0	28	52/00 (0)	73/24
		52/0	41/4	113337	1028125	Various Artists		Theme From "Twin Peaks - Fire Walk			
	With Me" - Angelo Badalamenti				Pure Moods		(10,)				
3	423652	pop	random	P	17	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	47344	1018869	Peter Murphy		Light Pours Out Of Me, The			Should
	The World Fail To Fall Apart				(14, 77,)						
4	423656	pop	random	P	34	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	47344	1018869	Peter Murphy		God Sends		Should The World Fail	
	To Fall Apart		(14, 77,)								
5	1193855	pop	random	P	37	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		Big Night Out		100%	
	Columbian *		(14, 77,)								
6	423649	random	random	R	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	47344	1018869	Peter Murphy		Final Solution		Should The World Fail	
	To Fall Apart		(14, 77,)								
7	1259512	random	random	P	45	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	137097	1028125	Various Artists		Portnawack - Typhoon		Made On Earth	
	(14, 77,)										
8	1259519	random	random	P	32	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	137097	1028125	Various Artists		Untitled - Total Eclipse		Made On Earth	
	(14, 77,)										
9	423657	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	47344	1018869	Peter Murphy		Blue Heart		Should The World Fail	
	To Fall Apart		(14, 77,)								
10	958997	random	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	105874	1028125	Various Artists		Freelon - Spacetime Continuum			Werks
	Like a Twelve Inch		(14, 77,)								
11	1193846	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		View Belongs To Everyone, The			
	100% Columbian *				(14, 77,)						
12	1193848	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		Back On The Block			100%
	Columbian *		(14, 77,)								
13	1193844	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		Up On The Hill		100%	
	Columbian *		(14, 77,)								
14	1193845	random	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		Love Unlimited		100%	
	Columbian *		(14, 77,)								
15	923902	random	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	101415	1028125	Various Artists		Grass Roots - Tricky/Roberto Malary Jr.			
	Tricky Presents Grassroots [EP]				(14, 77,)						
16	1193854	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		All My Time Is Gone			100%
	Columbian *		(14, 77,)								
17	1193849	pop	random	N	-1	47	100/25	0/0	22	52/00 (0)	52/17
		52/0	52/5	130669	1009757	Fun Lovin' Criminals		10th Street		100%	
	Columbian *		(14, 77,)								

18 1193852 pop random N -1 47 100/25 0/0 22 52/00 (0) 52/17
52/0 52/5 130669 1009757 Fun Lovin' Criminals We Are All Very Worried About You 100% Columbian * (14, 77,)

19 806170 random random N -1 47 100/25 0/0 22 52/00 (0) 52/17
52/0 52/5 88136 1028125 Various Artists Man's World, (It's Not) A - Strata 3 The Trip Hop Test Part 2 (14, 77,)

20 806163 random random N -1 47 100/25 0/0 22 52/00 (0) 52/17
52/0 52/5 88136 1028125 Various Artists Anafey - Hip Optimist The Trip Hop Test Part 2 (14, 77,)

«entries omitted».

1304 228812 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 25620 1030126 The Crystals I Wonder The Best Of The Crystals (23,)

1305 228814 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 25620 1030126 The Crystals Girls Can Tell The Best Of The Crystals (23,)

1306 228798 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 25620 1030126 The Crystals Oh, Yeah, Maybe, Baby The Best Of The Crystals (23,)

1307 228810 random random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 25620 1030126 The Crystals Heartbreaker The Best Of The Crystals (23,)

1308 740607 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 81532 1008091 EBN Get Down Ver. 2.2 Telecommunication Breakdown [ECD] (14, 77,)

1309 876063 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 95946 1012421 Howie B. Shag Music For Babies (14, 77,)

1310 914734 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 100059 1020939 Pet Fatherland Pet (14, 77,)

1311 882981 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 96691 1028125 Various Artists Million Town - Strange Cargo (The Kruder & Dorfmeister Session) A Journey Into Ambient Groove 3 (14, 77,)

1312 1320082 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 141627 1039729 Papa Vegas Something Wrong Hello Vertigo [4/27] (14, 77,)

1313 1242704 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 135883 1038686 The Hope Blister Hanky Panky Nohow Smile's OK... (14, 77,)

1314 942415 random random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 103598 1024664 Skeleton Key World's Most Famous Undertaker, The Skeleton Key [EP] (14, 77,)

1315 1119500 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 123589 1028125 Various Artists Take California - Propellerheads Digital Empire: Electronica's Best (14, 77,)

1316 528565 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 58464 1025129 Sons Of Champlin Get High Capitol Gold: The Best Of The Sons Of Champlin (14, 77,)

1317 528568 pop random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 58464 1025129 Sons Of Champlin It's Time Capitol Gold: The Best Of The Sons Of Champlin (14, 77,)

1318 942223 random random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 103571 1024799 Sloan G Turns To D One Chord To Another (14, 77,)

1319 942219 random random N -1 22 0/0 0/0 22 52/00 (0) 52/17
52/0 52/5 103571 1024799 Sloan Good In Everyone, The One Chord To Another (14, 77,)

1320	1017638	random	random	N	-1	22	0/0	0/0	22	52/00 (0)	52/17
		52/0	48/5	114082	1004159	David Byrne		Wicked Little Doll		Feelings *	
		(14, 77,)									

#	songID	query comm	origin albumID	status artistID	ord artist	score title	lastP. album	bds	impl.	rating(t)	djs	netP.
1321	809747	random	random	N	-1	22	0/0	0/0	22	52/00 (0)		52/17
		52/0	46/5	88473	1015875	Loop Guru		Jungle A	Duniya	(14, 77,)		
1322	455363	random	random	N	-1	21	0/0	0/0	21	52/00 (0)		52/17
		52/0	40/4	50841	1030292	Peter & Gordon		I Feel Like Going Out		The Best Of		
	Peter & Gordon (Rhino)			(23,)								
1323	814350	random	djArt	N	-1	18	0/0	0/0	18	52/00 (0)		40/13
		52/0	45/5	88938	1021734	Pulp		Death II	Separations	(14, 77,)		
1324	232378	djs	random	N	-1	12	0/0	0/0	12	52/00 (0)		20/7
		52/0	49/5	26074	1006547	The Damned		Smash It Up (Parts 1 & 2)		The Best Of		
	The Damned (Another...)			(14, 78,)								

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APPENDIX 2

SOURCE CODE

Internet Radio and Broadcast Method
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ALBUMARTISTDATA 4
ALBUMINFO 5
ARTISTINFO 7
AVERAGERATING 8
BANDWIDTH 9
BDSRANK 11
CACHEDRATING 12
CLIP 13
CLIPCOLLECTION 17
CLIPSCHEDULE 18
CONSTANTS 21
DBCONNECTION 23
DBEXCEPTION 26
DBPREPAREDSTATEMENT 27
DBRESULTSET 28
DJ 32
DJLIST 33
FREQUENCYCOUNTER 35
GENERATORPARAMETERS 38
GENREINDEX 40
GENRELIST 42
GETADS 44
GETBDSSTATIONS 46
GETGENRES 47
GETITEMRATINGSFROMDB 48
GETLASTPLAYED 49
GETNEWS 50

GETPLAYLIST 52
GETPLAYLISTSERVERS 54
GETPLAYLISTSERVERSINTERFACE 55
GETPOPULAR 56
GETRATINGS 57
GETRATINGSCACHEUSERS 61
GETRATINGSCACHEUSERSINTERFACE 63
GETRECENTLYPLAYED 64
GETSONGINFOSERVLET 66
GETSONGRATINGSFROMDB 72
INTHASH 73
ITEM 74
ITEMSPROFILE 76
MEDIA 78
MEDIAFORMAT 79
MEDIAGATEWAYSERVLET 80
MEDIALIST 85
PICKCOUNT 87
PICKLIST 89
PICKSTATUS 90
PLAYDATAHASH 91
PLAYDATES 92
PLAYLIST 100
PLAYLIST2 107
PLAYLISTCREATORTEST 108
PLAYLISTENTRY 109
PLAYLISTGENERATOR 110
PLAYLISTGENERATORSERVLET 122
PLAYLISTMAKER 127
PLAYLISTPARAMETERS 128
PLAYLISTSTATUS 129
POPULARSONGS 132
POPULATION 133
RATING 141

RATINGSCACHE 142
RATINGSPROFILE 148
RATINGWIDGETSERVLET 149
RECLIST 155
SAVECLIPS 158
SAVEPLAYLIST 160
SIMPLECLIP 162
SIMPLECLIPLIST 163
SIMPLEPLAYLIST 164
SONG 167
SONGDATA 169
SONGGROUP 176
SONGINFO 177
SONGINFOCACHE 180
SONGINFOCACHEUPDATER 187
SONGLIST 188
SONGRATING 191
STATION 192
STATIONLIST 193
UTIL 194
WEIGHTMATRIX 196

AlbumArtistData

```
package com.launch.PlaylistGenerator;
public class AlbumArtistData
{
	Item album = null;
	Item artist = null;

	boolean alreadyTriedAlbum = false;
	boolean alreadyTriedArtist = false;

	public void reset()
	{
		album = null;
		artist = null;
		alreadyTriedAlbum = false;
		alreadyTriedArtist = false;
	}

	public Item getAlbum(ItemsProfile items, SongData data)
	{
		if (alreadyTriedAlbum)
			return album;

		alreadyTriedAlbum = true;

		album = items.get(data.getAlbumID());

		return album;
	}
	public Item getArtist(ItemsProfile items, SongData data)
	{
		if (alreadyTriedArtist)
			return artist;

		alreadyTriedArtist = true;

		artist = items.get(data.getArtistID());

		return artist;
	}
}
```

AlbumInfo

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class AlbumInfo
{
	int ID;
	String title;
	ArtistInfo artist;

	Vector genres;
	public AlbumInfo(int ID)
	{
		this.ID = ID;
	}

	public String toString()
	{
		return "[albumID=" + ID + ", title=" + title
			+ ", genres=" + genresString() + ", artist=" + artist.toString() + "]";
	}

	public String genresString()
	{
		if (genres == null)
			return "(NONE)";

		String result = "";

		for (int i = 0; i < genres.size(); i++)
		{
			result = result.concat(genres.elementAt(i) + ", ");
		}
		return "(" + result + ")";
	}

	public int getArtistID() throws Exception
	{
		if (artist == null)
			throw new Exception("artist is not set for album " + ID + " (" + title + ") ");

		return artist.ID;
	}

	public boolean inGenres(short genreID)
	{
		if (genres == null)
			return false;

		return genres.contains(new Short(genreID));

	}

	public boolean inGenres(GenreList userGenres)
	{

		if (userGenres.allGenres == true)
			return true;

		if (genres == null)
```

```
60                      return false;

                // do it the other way, check each of the genres the song is
                // in and if it's in the user's genres

65              for (int i = 0; i < genres.size(); i++)
                {
                        Short genreID = (Short) genres.elementAt(i);

                        if (userGenres.exists(genreID))
70                              return true;
                }

                return false;
        }
75
        public void addGenre(short genreID)
        {

                if (genres == null)
80                      genres = new Vector(1,1);

                // be careful not to add duplicates
                Short genre = new Short(genreID);

85              if (!genres.contains(genre))
                        genres.addElement(new Short(genreID));

        }

90
}
```

ArtistInfo

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
public class ArtistInfo
{
        int ID;
        String title;
        Hashtable songs;

        public ArtistInfo(int ID)
        {
                this.ID = ID;
                songs = new Hashtable();

        }

        public String toString()
        {
                return "[artistID=" + ID + ", title=" + title + "]";
        }
        public final static boolean isVariousArtists(int itemID)
        {
                return (itemID == Constants.ARTIST_VARIOUS_ARTISTS
                        || itemID  == Constants.ARTIST_ORIGINAL_SOUNDTRACK
                        || itemID  == Constants.ARTIST_SOUNDTRACK);
        }

}
```

AverageRating

```
package com.launch.PlaylistGenerator;
public class AverageRating extends Rating
{
	private short count = 0;
	private int sum;
	private boolean calculated = false;
	public AverageRating()
	{
		super();
	}
	public AverageRating(short defaultRating)
	{
		super(defaultRating);
	}
	public void add(int value)
	{
		sum += value;
		count++;
		calculated = false;
	}
	public short get()
	{
		calculate();
		return super.get();
	}
	public short count()
	{
		return count;
	}
	private void calculate()
	{
		if (!calculated)
		{
			if (count > 0)
			{
				set(Util.average(count, sum));
				set = true;
			}
			calculated = true;
		}
	}
	public String toString()
	{
		String ratingStr = "(Not calculated)";
		if (set) ratingStr = "" + rating;
		return sum + "/" + count + "=" + ratingStr;
	}
}
```

Bandwidth

```
package com.launch.PlaylistGenerator;
public class Bandwidth
{
    public final static short SPEED_28  = 28;
    public final static short SPEED_56  = 56;
    public final static short SPEED_100 = 100;
    public final static short SPEED_128 = 128;
    public final static short SPEED_300 = 300;
    public final static short SPEED_500 = 500;

    private boolean beenset = false;
    private short value = SPEED_28;

    public Bandwidth()
    {

    }

    public Bandwidth(short speed)
    {
        value = speed;
        beenset = true;
    }

    public Bandwidth(String speed)
    {
        if (speed == null)
        {
            beenset = false;
        }
        else
        {
            if (speed.equals("28"))
                set(SPEED_28);
            else if (speed.equals("56"))
                set(SPEED_56);
            else if (speed.equals("100"))
                set(SPEED_100);
            else if (speed.equals("128"))
                set(SPEED_128);
            else if (speed.equals("300"))
                set(SPEED_300);
            else if (speed.equals("500"))
                set(SPEED_500);
            else
            {
                beenset = false;
            }
        }
    }

    public String toString()
    {

        if (value == SPEED_28)
            return "28.8k";
        else if (value == SPEED_56)
            return "56k";
```

```
60                      else if (value == SPEED_100)
                                return "100k";
                        else if (value == SPEED_128)
                                return "128k";
                        else if (value == SPEED_300)
65                              return "300k";
                        else if (value == SPEED_500)
                                return "56k";
                        return "UNKNOWN (" + value + ")";
                }
70
                public short get()
                {
                        return value;
                }
75
                public void set(short speed)
                {
                        if (speed == SPEED_28
                                || speed == SPEED_56
80                              || speed == SPEED_100
                                || speed == SPEED_128
                                || speed == SPEED_300
                                || speed == SPEED_500)
                        {
85                              value = speed;
                                beenset = true;
                        }
                        else
                                beenset = false;
90              }


                public boolean load(DBConnection conn, int userID)
                {
95                      try
                        {
                                DBResultSet rs = conn.executeSQL("exec sp_a150UserPreference_GetValue_xsxx " +
        userID);
                                if (!rs.getBOF() && !rs.getEOF())
100                             {
                                        set(rs.getShort("iDefaultBandwidth"));
                                }
                        }
                        catch (DBException oops)
105                     {
                                Util.debug("DB Exception in Bandwidth::load: " + oops.getMessage());
                        }

                        return isSet();
110
                }

                public boolean isSet()
                {
115                     return beenset;
                }
        }
```

BDSRank

```
package com.launch.PlaylistGenerator;
public class BDSRank
{
    short stationID;
    byte rank;

    public BDSRank(short stationID, byte rank)
    {
        this.stationID = stationID;
        this.rank = rank;
    }

    public String toString()
    {
        return stationID + ":" + rank;
    }

}
```

CachedRating

```
package com.launch.PlaylistGenerator;
import java.io.*;
import java.util.Date;
/**
 * This class is used to model a single rating in the cache.
 **/
public final class CachedRating implements Serializable
{
        public int userID;
        public int itemID;
        public byte rating;
        public byte type;
        private Date created = new Date();

    //---------------------------------------------------------
        public CachedRating(int userID, int itemID, byte rating, byte type)
        {
                this.userID = userID;
                this.itemID = itemID;
                this.rating = rating;
                this.type   = type;
        }
        public final String toString()
        {
                return("user:" + userID + ", itemID:" + itemID + ", rating:" + rating + ", type:" +
typeString(type) + ", date:" + created.toString() + Util.newLine);
        }

        public final static String typeString(byte type)
        {
                if (type == Constants.ITEM_TYPE_SONG)
                        return "song";
                else if (type == Constants.ITEM_TYPE_ALBUM)
                        return "album";
                else if (type == Constants.ITEM_TYPE_ARTIST)
                        return "artist";
                return "unknown";
        }

        public String hashKey()
        {
                return itemID + ":" + type;
        }
}
```

Clip

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class Clip
{
	public final static byte TYPE_NONE = 0;
	public final static byte TYPE_NEWS = 1;
	public final static byte TYPE_AD   = 2;
	public final static byte TYPE_INTERSTITIAL = 3;
	public final static byte TYPE_TIP = 4;
	public final static byte TYPE_SONG = 5;
	public final static byte TYPE_BROADCAST = 6;

	public int ID;
	public byte type;
	public int mediaID;
	public Date lastPlayed;
	public String name, directory, server, filepath;
	public MediaList media;
	byte origin;

	private boolean set = false;
	public Clip(byte type)
	{
		this.type = type;
		media = new MediaList();
	}
	public Clip(int ID, byte type)
	{
		this(type);
		this.ID = ID;
	}

	public Clip(int ID, byte type, int mediaID, String name, Date lastPlayed)
	{
		this(ID, type);
		this.ID     = ID;
		this.mediaID   = mediaID;
		this.name      = name;
		this.lastPlayed = lastPlayed;
	}

	public byte type() { return type; }

	public boolean isSet() { return set; }

	private void setDirectory(String newDir)
	{
		if (!newDir.equals(" "))
		{
			directory = newDir;
		}
	}
	public void logPlay(DBConnection conn, int userID)
	{
		String sql = "";

		if (type == TYPE_SONG)
			sql = "exec sp_IcLogPlaySong_isud "     + userID + ", " + mediaID + ", " + ID + ", " +
```

```
60      origin;
                else if (type == TYPE_AD)
                        sql = "exec sp_lcLogPlayAd_isud "       + userID + ", " + mediaID + ", " + ID;
                else if (type == TYPE_NEWS)
                        sql = "exec sp_lcLogPlayNews_isud "     + userID + ", " + mediaID + ", " + ID;
65              else if (type == TYPE_TIP)
                        sql = "exec sp_lcLogPlayTip_isud "      + userID + ", " + mediaID + ", " + ID;
        //      else if (type == TYPE_BROADCAST)
        //              sql = "exec sp_lcLogPlayBroadcast_isux " + userID + ", " + mediaType;

70              try
                {
                        conn.executeUpdate(sql, true);
                }
                catch (DBException e)
75              {
                        System.err.println("DBException in Clip:logPlay:" + e.toString());
                }

        }
80
        public boolean getPath(DBConnection conn, ClipSchedule schedule)
        {
                if (type == TYPE_NONE)
                        return false;
85
                SimpleClipList list = null;

                if (type == TYPE_SONG)
                        list = schedule.playlist.songs;
90              else if (type == TYPE_AD)
                        list = schedule.playlist.ads;
                else if (type == TYPE_TIP)
                        list = schedule.playlist.tips;
                else if (type == TYPE_NEWS)
95                      list = schedule.playlist.news;

                if (list == null)
                        return false;

100             SimpleClip yip = list.pop();

                if (yip == null)
                        return false;

105             mediaID = yip.mediaID;
                ID  = yip.ID;
                origin  = yip.origin;


110             try
                {
                        DBResultSet rs = conn.executeSQL("exec sp_lcGetMediaPath_xsxx " + mediaID);

                        if (!rs.getBOF() && !rs.getEOF())
115                     {
                                setDirectory(rs.getString("directory"));
                                server   = rs.getString("server");
                                filepath = rs.getString("filepath");

120                             set = true;
```

```
                        }
                }
                catch (DBException e)
                {
125                     System.err.println("DBException in Clip::getPath: " + e.toString());
                }

                return set;
        }
130     /*
        public boolean pop(DBConnection conn, int userID, int context)
        {
                set = false;
                try
135             {
                        DBResultSet rs;
                        String the_command;

                        int contextNum = 0;
140                     if (context > 1) contextNum = 1;

                        if (type==TYPE_BROADCAST)
                        {
                                the_command="exec " + BROADCAST_SP + " " + userID + ", " + type + ", "
145 + context;
                        }
                        else
                        {
                                String stored_proc = null;
150                             if    (type == TYPE_AD  ) stored_proc = ADS_SP;
                                else if (type == TYPE_TIP ) stored_proc = TIPS_SP;
                                else if (type == TYPE_NEWS) stored_proc = NEWS_SP;
                                else                        stored_proc = SONG_SP;
                                the_command= "exec " + stored_proc + " " + userID + ", " + contextNum;
155                     }
                        rs = conn.executeSQL(the_command);
                        if (!rs.getBOF() && !rs.getEOF())
                        {
                                setDirectory(rs.getString("directory"));
160                             server   = rs.getString("server");
                                filepath = rs.getString("filepath");

                                set = true;
                        }
165             }
                catch (DBException e)
                {
                        System.err.println("DBException in Clip::pop: " + e.toString());
                }
170
                return isSet();
        }
        */

175     public String path()
        {

                return server
                        + directory
180                     + "/"
                        + filepath;
```

```
	}

	public String toString()
	{
		return "Clip type (" + typeName() + "), id = " + mediaID
			+ ", lastPlayed = " + lastPlayed
			+ ", media = " + media.toString()
			+ ", path = " + path();

	}

	public PlaylistEntry toPlaylistEntry(short mediaType)
	{

		PlaylistEntry entry = new PlaylistEntry();
		entry.mediaID = media.getID(mediaType);
		entry.title   = name;

		entry.filepath = media.getFilepath(mediaType);

		return entry;
	}

	public SimpleClip toSimpleClip(short mediaType)
	{
		return new SimpleClip(ID, media.getID(mediaType));
	}

	public String typeName()
	{
		switch(type)
		{
		case TYPE_AD:
			return "Ad";
		case TYPE_BROADCAST:
			return "Broadcast";
		case TYPE_INTERSTITIAL:
			return "Interstitial";
		case TYPE_NEWS:
			return "News";
		case TYPE_TIP:
			return "Tip";
		case TYPE_SONG:
			return "Song";
		}

		return "?";
	}

	public String URL()
	{

		return server
			+ directory
			+ "/"
			+ filepath;
	}

}
```

ClipCollection

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
public class ClipCollection extends Hashtable
{
        public Clip put(int clipID, Clip aClip)
        {
                return (Clip) put(new Integer(clipID), aClip);
        }

        public Clip get (int clipID)
        {
                return (Clip) get(new Integer(clipID));
        }
}
```

ClipSchedule

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import javax.servlet.ServletOutputStream;
public class ClipSchedule
{
	private Date dbDate;

	private int userID, lastBroadcast, currentBroadcast;

	private boolean set = false;
	public SimplePlaylist playlist;

	public ClipSchedule (int userID)
	{
		this.userID = userID;
	}

	public void init(DBConnection conn)
	{

		set = false;
		try
		{
			DBResultSet rs = conn.executeSQL("exec sp_lcGetClipSchedule_xsxx " + userID);
			if (!rs.getBOF() && !rs.getEOF())
			{
				dbDate        = rs.getTimestamp("dbDate");
				lastBroadcast  = rs.getInt("lastBroadcastID");
				currentBroadcast = rs.getInt("broadcastID");
				playlist      = SimplePlaylist.fromBytes(rs.getBytes("playlist"));

			}
			else
			{
				dbDate = new Date();
			}

			// the first time a playlist is created for a user, the dates will be null

			if (playlist != null)
			{
				if (playlist.lastAd   == null) playlist.lastAd   = dbDate;
				if (playlist.lastNews == null) playlist.lastNews = dbDate;
				if (playlist.lastTip  == null) playlist.lastTip  = dbDate;
				set = true;
			}
		}
		catch (DBException e)
		{
			System.err.println("DBException in ClipSchedule::init:" + e.toString());
		}
	}

	private long dateDiff(Date diffMe)
	{

		if (diffMe == null)
			diffMe = new Date(0);
```

```
60
                return (long) ((dbDate.getTime() - diffMe.getTime()) / (1000.0 * 60));
        }

        public byte nextClipType(boolean debug, ServletOutputStream out)
65      {

                long adDiff, newsDiff, tipDiff;

                while (true)
70              {
                        adDiff  = dateDiff(playlist.lastAd);
                        newsDiff = dateDiff(playlist.lastNews);
                        tipDiff  = dateDiff(playlist.lastTip);

75                      if (debug)
                        {
                                Util.out(out, "dbDate is " + dbDate.toString());

                                Util.out(out, "lastAdDate is " + playlist.lastAd);
80                              Util.out(out, "next ad in " + (Constants.AD_THRESHOLD - adDiff) + "
minutes");

                                Util.out(out, "lastNewsDate is " +  playlist.lastNews);
                                Util.out(out, "next news clip in " + (Constants.NEWS_THRESHOLD -
85  newsDiff) + " minutes");

                                Util.out(out, "lastTipDate is " +  playlist.lastTip);
                                Util.out(out, "next tip in  " + (Constants.TIP_THRESHOLD - tipDiff) + "
minutes");
90                      }

                        if (playlist == null)
                        {
                                System.err.println(new Date().toString() + " nextClipType: userID " + userID
95  + " has no/invalid playlist");
                                return Clip.TYPE_NONE;
                        }

                        if (currentBroadcast > lastBroadcast)
100                     {
                                if (debug) Util.out(out, "getting broadcast");
                                lastBroadcast = currentBroadcast;
                                return Clip.TYPE_BROADCAST;
                        }
105                     else if (adDiff >= Constants.AD_THRESHOLD)
                        {
                                if (debug) Util.out(out, "playing AD");
                                playlist.lastAd = dbDate;

110                             if (playlist.ads.isEmpty())
                                        System.err.println(new Date().toString() + " userID " + userID + " is
out of ads");
                                else
                                        return Clip.TYPE_AD;
115                     }
                        else if (newsDiff >= Constants.NEWS_THRESHOLD)
                        {
                                if (debug) Util.out(out, "playing NEWS");
                                playlist.lastNews = dbDate;
120
```

```
                                        if (playlist.news.isEmpty())
                                                System.err.println(new Date().toString() + " userID " + userID + " is
    out of news");
                                        else
125                                             return Clip.TYPE_NEWS;
                                }
                                else if (tipDiff >= Constants.TIP_THRESHOLD)
                                {

130                                     if (debug) Util.out(out, "playing TIP");
                                        playlist.lastTip = dbDate;

                                        if (playlist.tips.isEmpty())
                                                System.err.println(new Date().toString() + " userID " + userID + " is
135 out of tips");
                                        else
                                                return Clip.TYPE_TIP;
                                }
                                else
140                             {
                                        if (debug) Util.out(out, "playing SONG");

                                        if (playlist.songs.isEmpty())
                                        {
145                                             System.err.println(new Date().toString() + " userID " + userID + " is
    out of songs");
                                                return Clip.TYPE_NONE;
                                        }
                                        else
150                                             return Clip.TYPE_SONG;
                                }

                        }
                        //return Clip.TYPE_NONE;
155             }
    }
```

Constants

```
package com.launch.PlaylistGenerator;
public interface Constants
{
    // live
    /*
    public final static String DB_SOURCE              = "LAUNCHcast";
    public final static String DB_USERNAME            = "dbClient";
    public final static String DB_PASSWORD            = "83kareem23";
    public final static String DB_DBNAME              = "dbLaunchProd";
    public final static String DB_SERVER              = "209.67.158.19"; // DB3
    public final static short  DB_PORT                = 1433;
    public final static String STREAM_URL = "http://lcplaylist.launch.com/servlet/gateway";
    public final static String STREAM_SERVER = "http://lcstream.launch.com";
    */
    // development
    public final static String DB_SOURCE              = "LAUNCHcast";
    public final static String DB_USERNAME            = "dbClient";
    public final static String DB_PASSWORD            = "29Idiocy99";
    public final static String DB_DBNAME              = "dbLaunchProd";
    public final static String DB_SERVER              = "zeus";
    public final static short  DB_PORT                = 1433;
    public final static String STREAM_URL = "http://devweb7.launch.com/servlet/gateway";
    public final static String STREAM_SERVER = "http://devweb7.launch.com/F";
    public final static int RIAA_MAX_SONGS_FROM_ALBUM     = 2;
    public final static int RIAA_MAX_SONGS_BY_ARTIST      = 3;
    public final static int BDS_SCORE_MAX_POINTS          = 41;
    public final static int BDS_SCORE_POINTBAR            = 20;
    public final static int DEFAULT_LASTPLAYED_SCORE                = 100;
    public final static int DEFAULT_MEDIATYPE                       = 211;  // 16 Mono
    public final static int DEFAULT_UNRATED_RATIO         = 50;
    public final static int DEFAULT_PICK_FACTOR           = 7;
    public final static int DEFAULT_BDS_SCORE                       = 0;
    public final static int MAX_PERCENT_RATED_SONGS_TO_PICK = 20;
    public final static int NEW_USER_UNRATED_RATIO        = 90;
    public final static int MIN_RATINGS_TO_HONOR_RATIO    = 100;
    public final static int MIN_SIZE_FOR_NO_UNRATED       = 200;
    public final static int MAX_ORDINAL                                     = 1000;
    // for calculating implicit based on other song ratings
    public final static int MAX_SONGS_BY_ARTIST                     = 4;
    // random picking
    public final static int RANDOM_SONGS_COUNT            = 5000;
    // this is a percent of the total number of songs in the database
    public final static int MIN_SONGS_IN_GENRES_TO_GET_RANDOM = 5;
    public final static int MIN_RATING_FOR_RATED_SOURCE             = 35;
    // songs with average rating above this are considered popular
    // also change this at the top of LAUNCHCast/player/getsonginfo
    public final static int POPULAR_THRESHOLD                       = 58;
    public final static int DEFAULT_RATING                          = 52; // global average
for all songs
    public final static int DEFAULT_DJS_SCORE                       = DEFAULT_RATING;
    public final static int DEFAULT_NETP_SCORE                      = DEFAULT_RATING;
    public final static byte DEFAULT_COMMRATING                     = DEFAULT_RATING;
    public final static int MAX_RATINGS_TO_GET                      = 500;
    public final static int MAX_DJ_RATINGS_TO_GET           = 500;
    public final static int ARTIST_VARIOUS_ARTISTS        = 1028125;
    public final static int ARTIST_ORIGINAL_SOUNDTRACK              = 1020156;
    public final static int ARTIST_SOUNDTRACK                       = 1036715;
    public final static int DEFAULT_PLAYLIST_SIZE         = 50;
```

```
60          public final static int MAX_NEWS_ITEMS                                  = 0;
            public final static int MAX_ADS                                                 = 20;
            public final static int MAX_TIPS_ITEMS                                  = 0;
            public final static int REFRESH_AT_SONGS_LEFT                   = 8;
            public final static int REFRESH_AT_NEW_RATINGS_COUNT    = 15;
65          public final static int AD_THRESHOLD                    = 30;
        public final static int NEWS_THRESHOLD                  = 99999999;
        public final static int TIP_THRESHOLD                   = 99999999;
            public final static byte ITEM_TYPE_SONG                 = 1;
            public final static byte ITEM_TYPE_ALBUM                = 2;
70          public final static byte ITEM_TYPE_ARTIST               = 3;
            // the size of the ratings cache FOR EACH user
            public final static int RATINGS_CACHE_INITIAL_SIZE      = 2000;
            public final static int RATING_UPDATE_LIST_INITIAL_SIZE = 100;
            // for updating the ratings caches
75          public static final int PROPAGATE_DIRTY_RATING_SLEEP_TIME = 60 * 1000; // every 60 seconds
            public static final String POST_HEADER = "POST /servlet/playlist HTTP/1.0";
            public static final int PORT_NUMBER = 80;
        }
        Constants.java    Page 2 of 2    11/05/99 1:24 PM
```

DBConnection

```
package com.launch.PlaylistGenerator;
import java.util.Properties;
import com.inet.tds.TdsDriver;
import java.sql.SQLException;
import java.sql.Statement;
import java.sql.Connection;
import java.sql.Driver;
import java.sql.DriverManager;
import java.util.Date;
public class DBConnection
{
	private Connection conn;

	public static Driver DBDriver;

	public DBConnection() throws DBException
	{

		if (DBConnection.DBDriver == null)
			DBConnection.initializeDriver();

		if (DBConnection.DBDriver == null)
			return;

		String url = "jdbc:inetdae:"
			+ Constants.DB_SERVER
			+ ":"
			+ Constants.DB_PORT
			+ "?sql7=true&database="
			+ Constants.DB_DBNAME
			+ "&user="
			+ Constants.DB_USERNAME
			+ "&password="
			+ Constants.DB_PASSWORD
			+ "";

		try
		{
			conn = DBConnection.DBDriver.connect(url, null);
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
		catch (Exception err)
		{
			Util.debug("Exception: " + err.toString());
		}
	}

	private static void initializeDriver()
	{
		DBDriver = new com.inet.tds.TdsDriver();

	}

	private DBResultSet execute(String sql, boolean printSQL) throws DBException
	{
```

```
60                  if (printSQL)
                            Util.debug(Util.newLine + Thread.currentThread().getName() + " Running SQL: " +
sql);
                    DBResultSet myRs = new DBResultSet();
                    try
65                  {

                            // if we don't have a query, don't run it. It'll hang
                            if (sql.length() <= 0)
                                    return myRs;
70
                            Statement query = conn.createStatement();

                            if (query.execute(sql))
                            {
75                                  myRs.setResultSet(query.getResultSet());
                            }
                    }
                    catch (SQLException oops)
                    {
80                          System.err.println(Util.newLine + (new Date()).toString() + " DBException: " +
Thread.currentThread().getName() + " Running SQL: " + sql + ", exception: " + oops.toString());
                            oops.printStackTrace();
                            throw new DBException(oops);
                    }
85
                    return myRs;
            }

            public void executeUpdate(String sql, boolean printSQL) throws DBException
90          {
                    if (printSQL)
                            Util.debug(Util.newLine + Thread.currentThread().getName() + " Running SQL: " +
sql);
                    try
95                  {

                            // if we don't have a query, don't run it. It'll hang
                            if (sql.length() <= 0)
                                    return;
100
                            Statement query = conn.createStatement();

                            query.executeUpdate(sql);
                    }
105                 catch (SQLException oops)
                    {
                            // when we call a stored proc that gets a text pointer this happens,
                            // so ignore it
                            if (oops.getMessage().indexOf("Unknown datatype") > -1)
110                         {
            //                      System.err.println("ignoring unknown datatype exception");
                                    return;
                            }

115                         System.err.println(Util.newLine + (new Date()).toString() + " DBException: " +
Thread.currentThread().getName() + " Running SQL: " + sql + ", exception: " + oops.toString());
                            oops.printStackTrace();
                            throw new DBException(oops);
                    }
120
```

```
	}


	public DBResultSet executeSQL(String sql) throws DBException
	{
		return execute(sql, true);
	}

	public DBResultSet executeSQL(String sql, boolean printSQL) throws DBException
	{
		return execute(sql, printSQL);
	}

	public DBPreparedStatement prepareStatement(String sql) throws DBException
	{

		try
		{
			return new DBPreparedStatement(conn.prepareStatement(sql));
		}
		catch (SQLException oops)
		{
			System.err.println(Util.newLine + (new Date()).toString() + " DBException in
prepareStatement: " + Thread.currentThread().getName() + ", exception: " + oops.toString());
			oops.printStackTrace();
			throw new DBException(oops);
		}

	}

	public boolean close() throws DBException
	{
		if (conn == null)
			return false;

		try
		{
			conn.close();
			conn = null;
			return true;
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
	}

	public void finalize() throws DBException
	{
		// in case someone forgets
		close();
	}

}
```

DBException

```
package com.launch.PlaylistGenerator;
import java.sql.SQLException;
public class DBException extends Exception
{
        SQLException oops;

        public DBException(SQLException oops)
        {
                this.oops = oops;
        }

        public String getMessage()
        {
                return oops.toString();
        }
}
```

DBPreparedStatement

```
package com.launch.PlaylistGenerator;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import java.util.Date;
public class DBPreparedStatement
{
	PreparedStatement statement;

	public DBPreparedStatement(PreparedStatement statement)
	{
		this.statement = statement;
	}

	public void setBytes(int parameterIndex, byte x[]) throws DBException
	{
		try
		{
			if (statement != null)
			{
				statement.setBytes(parameterIndex, x);
			}
		}
		catch (SQLException e)
		{
			throw new DBException(e);
		}
	}

	public void executeUpdate() throws DBException
	{
		Util.debug(Util.newLine + Thread.currentThread().getName() + " Running prepared statement");

		if (statement == null)
			return;

		try
		{
			statement.executeUpdate();

		}
		catch (SQLException oops)
		{
			System.err.println(Util.newLine + (new Date()).toString() + " DBException: " +
Thread.currentThread().getName() + " Running Statement, exception: " + oops.toString());
			oops.printStackTrace();
			throw new DBException(oops);
		}
	}

}
```

DBResultSet

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Timestamp;
import java.io.InputStream;
public class DBResultSet
{
	private ResultSet rs;
	private boolean atEOF = false;
	private boolean atBOF = true;
	public void setResultSet(ResultSet aRS) throws DBException
	{
		try
		{
			rs = aRS;
			if (rs != null)
				atBOF = !rs.next();
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
	}
	public int getInt(String columnName) throws DBException
	{
		try
		{
			return rs.getInt(columnName);
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
	}
	public int getInt(int position) throws DBException
	{
		try
		{
			return rs.getInt(position);
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
	}

	public InputStream getAsciiStream(String columnName) throws DBException
	{
		try
		{
			return rs.getAsciiStream(columnName);
		}
		catch (SQLException oops)
		{
			throw new DBException(oops);
		}
	}
```

```
60
        public short getShort(String columnName) throws DBException
        {
                try
                {
65                      return rs.getShort(columnName);
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
70              }
        }
        public boolean getBoolean(String columnName) throws DBException
        {
                try
75              {
                        return rs.getBoolean(columnName);
                }
                catch (SQLException oops)
                {
80                      throw new DBException(oops);
                }
        }

        public byte[] getBytes(String columnName) throws DBException
85      {
                try
                {
                        return rs.getBytes(columnName);
                }
90              catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
95
        public float getFloat(String columnName) throws DBException
        {
                try
                {
100                     return rs.getFloat(columnName);
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
105             }
        }
        public float getFloat(int position) throws DBException
        {
                try
110             {
                        return rs.getFloat(position);
                }
                catch (SQLException oops)
                {
115                     throw new DBException(oops);
                }
        }
        public String getString(String columnName) throws DBException
        {
120             try
```

```
                {
                        return rs.getString(columnName);
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
        public Date getDate(String columnName) throws DBException
        {
                try
                {
                        return rs.getDate(columnName);
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
        public Timestamp getTimestamp(String columnName) throws DBException
        {
                try
                {
                        return rs.getTimestamp(columnName);
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
        public boolean getBOF() throws DBException
        {
                return atBOF;
        }
        public boolean getEOF() throws DBException
        {
                return atEOF;
        }
        public void next() throws DBException
        {
                try
                {
                        atEOF = !rs.next();
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
        public boolean wasNull() throws DBException
        {
                try
                {
                        return rs.wasNull();
                }
                catch (SQLException oops)
                {
                        throw new DBException(oops);
                }
        }
}
```

DJ

```
package com.launch.PlaylistGenerator;
public class DJ
{
        public int userID;
        public String alias;
        public DJ (int id, String name)
        {
                this(id);
                alias = name;
        }

        public DJ (int id)
        {
                userID = id;
        }

}
```

DJList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class DJList extends Vector
{

        public DJ djAt(int i)
        {
                return (DJ) elementAt(i);
        }

        public String inList()
        {
                Integer list[] = new Integer[size()];

                int last = 0;

                for (int i = 0; i < this.size(); i++)
                {
                        list[i] = new Integer(djAt(i).userID);
                }

                return Util.join(", ", list);
        }
        public boolean load(DBConnection conn, int userID, int moodID)
        {

                short djCount = 0;

                try
                {

                        DBResultSet rs = conn.executeSQL("exec sp_lcoGetDJs_xsxx "
                                                                                + userID + ", "
                                                                                + moodID);

                        while (!rs.getBOF() && !rs.getEOF())
                        {

                                addElement(new DJ(rs.getInt("djID")));

                                rs.next();
                                djCount++;
                        }

                        Util.debug(Thread.currentThread().getName() + " added " + djCount + " DJs");
                }
                catch (DBException oops)
                {
                        Util.debug("DB Exception in DJList::load: " + oops.getMessage());
                }

                return (djCount > 0);
        }

        public Vector asIDVector()
        {
                Vector users = new Vector(10);
```

```
60                      for (int i = 0; i < this.size(); i++)
                        {
                                users.addElement(new Integer(((DJ) elementAt(i)).userID));
                        }

65                      return users;
                }

        }
```

FrequencyCounter

```
package com.launch.PlaylistGenerator;
import java.util.*;
/**
 * FrequencyCounter is a Hashtable of the form (Object, Integer)
 * <br><br>
 * okay I realize the getLargest and getSmallestValue
 * methods are very inefficient (CPU wise) but these methods
 * aren't called often, if they are then some one should
 * do an nlog(n) sort on them then just pick out the largest
 * after that
 **/
public class FrequencyCounter extends Hashtable
{
	public FrequencyCounter()
	{
	}

	public FrequencyCounter(int i)
	{
		super(i);
	}

	public void incrementValue(Object o)
	{
		Integer i=(Integer)get(o);

		if (i==null)
		{
			put(o, new Integer(1));
		}
		else
		{
			put(o, new Integer((i.intValue())+1));
		}
	}


	public FrequencyCounter getLargest(int n)
	{
		FrequencyCounter fc=new FrequencyCounter(n+10);

		Integer temp_int;
		Object temp_object;
		Object smallest_value_key=null;
		int smallest_value;
		Enumeration e=keys();

		while (e.hasMoreElements())
		{
			temp_object=e.nextElement();
			temp_int=(Integer)get(temp_object);

			if (fc.size()>=n)
			{
				smallest_value_key=fc.getSmallestValue();
				smallest_value=((Integer)fc.get(smallest_value_key)).intValue();
				if (temp_int.intValue()>smallest_value)
				{
```

```
60                                      fc.remove(smallest_value_key);
                                        fc.put(temp_object, temp_int);
                                }
                        }
                        else
65                      {
                                fc.put(temp_object, temp_int);
                        }
                }

70              return(fc);
        }


        /** @return null if list is empty */
75      public Object getSmallestValue()
        {
                int smallest_value=Integer.MAX_VALUE;
                Object smallest_value_key=null;

80              int temp_int;
                Object temp_object;

                Enumeration e=keys();
                while(e.hasMoreElements())
85              {
                        temp_object=e.nextElement();
                        temp_int=((Integer)get(temp_object)).intValue();

                        if (temp_int<smallest_value)
90                      {
                                smallest_value=temp_int;
                                smallest_value_key=temp_object;
                        }
                }
95
                return(smallest_value_key);
        }


100     //********************************************************
        // The following is a test function

        public static void main(String argv[])
        {
105             FrequencyCounter fc=new FrequencyCounter();

                fc.incrementValue("one");
                fc.incrementValue("two");
                fc.incrementValue("two");
110
                fc.incrementValue("three");
                fc.incrementValue("three");
                fc.incrementValue("three");

115             fc.incrementValue("four");
                fc.incrementValue("four");
                fc.incrementValue("four");
                fc.incrementValue("four");
                System.out.println(fc);
120             System.out.println("smallest "+ fc.getSmallestValue());
```

```
                System.out.println("largest 2" + fc.getLargest(2));
        }

    }
```

GeneratorParameters

```
package com.launch.PlaylistGenerator;

import javax.servlet.http.HttpServletRequest;
public class GeneratorParameters
{

        private int userID, moodID, djID;
        private Bandwidth speed;
        private boolean debug, matrix, forceRefresh, dontsave;
        private MediaFormat format;

        private boolean moodIDSet   = false;
        private boolean djIDSet     = false;

        private int debugFormat = Util.DISPLAY_TEXT;

        public Bandwidth speed()
        {
                return speed;
        }

        public MediaFormat format()
        {
                return format;
        }

        public int debugFormat()
        {
                return debugFormat;
        }

        public int userID()
        {
                return userID;
        }

        public int moodID()
        {
                return moodID;
        }

        public int djID()
        {
                if (djIDSet)
                        return djID;

                return userID;
        }

        public boolean debug()
        {
                return debug;
        }

        public boolean matrix()
        {
                return matrix;
        }
```

```
60
        public boolean forceRefresh()
        {
                return forceRefresh;
        }
65
        public boolean dontsave()
        {
                return dontsave;
        }
70
        public GeneratorParameters(HttpServletRequest request)
        {

                debug      = (request.getParameter("ralph")      != null);
75              matrix     = (request.getParameter("matrix")     != null);
                forceRefresh = (request.getParameter("forceRefresh") != null);
                dontsave   = (request.getParameter("dontsave")   != null);

                String debugFormatString = request.getParameter("format");
80
                if (debugFormatString != null && debugFormatString.equals("html"))
                        debugFormat = Util.DISPLAY_HTML;

                try { userID  = Integer.parseInt(request.getParameter("u")); }
85              catch (NumberFormatException e) { userID = 0; }

                try { moodID = Integer.parseInt(request.getParameter("m")); }
                catch (NumberFormatException e) { moodID = 0; moodIDSet = false;}
                moodIDSet = true;
90
                try { djID = Integer.parseInt(request.getParameter("d")); }
                catch (NumberFormatException e) { djID = userID; djIDSet = false;}

                djIDSet = true;
95
                if (djID <= 0)
                {
                        djID = userID;
                        djIDSet = false;
100             }

                speed = new Bandwidth(request.getParameter("b"));

                format = new MediaFormat();
105
        }

}

110 GeneratorParameters.java Page 2 of 2        11/05/99 1:24 PM
```

GenreIndex

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
import java.util.Vector;
public class GenreIndex extends Hashtable
{

	public GenreIndex(int x, int y)
	{
		super(x, y);
	}

	public void add(short index, SongInfo info)
	{
		SongList list = get(index);

		if (list == null)
		{
			list = new SongList();
			put(new Short(index), list);
		}

		list.addElement(info);

	}

	public SongList get(int index)
	{
		return (SongList) get(new Short((short) index));
	}

	public int countInGenreList(GenreList myGenres)
	{
		int result = 0;

		SongList list;

		for (int i = 0; i < myGenres.size(); i++)
		{
			list = get(myGenres.genreAt(i));

			if (list != null)
			{
				result += list.size();
			}
		}
		return result;
	}

	/**
	 * returns a COPY of the list of songs in genres
	 */
	public SongList getInGenreList(GenreList myGenres)
	{
		SongList result = new SongList();

		for (int i = 0; i < myGenres.size(); i++)
		{
			result.addElements(get(myGenres.genreAt(i)));
```

```
60                      }
                        return result;
                }

                /**
65               * returns a COPY of the list of songs in a genre
                 */
                public SongList getInGenre(int genreID)
                {
                        SongList list = get(genreID);
70                      SongList result;

                        if (list == null)
                                list = new SongList();
                        result = (SongList) list.clone();
75
                        return result;
                }

        }
80      GenreIndex.java  Page 2 of 2        11/05/99 1:28 PM
```

GenreList

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
public class GenreList
{
	private int genres[];
	private Hashtable hash;

	private byte next;

	public boolean allGenres = true;

	public GenreList()
	{
		hash = new Hashtable(1,1);
		genres = new int[100];
	}

	public int add(short genreID)
	{
		allGenres = false;
		hash.put(new Short(genreID), new Boolean(true));
		genres[next] = genreID;
		next++;

		return genres[next - 1];
	}

	public int size()
	{
		return next;
	}

	public int genreAt(int pos)
	{
		return genres[pos];
	}

	public boolean exists(Short genreID)
	{

		if (next == 0)
			return true;

		else
			return hash.containsKey(genreID);
	}

	public String toString() {

		String result = "";

		for (int i = 0; i < size(); i++)
		{
			result = result.concat(genreAt(i) + ", ");

		}

		return result;
```

```
60              }
        }
```

GetAds

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import java.util.Vector;
public class GetAds extends Thread
{
	Vector ads;
	int userID;
	short mediaType;

	public GetAds(Vector ads, int userID, short mediaType)
	{
		this.ads	= ads;
		this.userID	= userID;
		this.mediaType = mediaType;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetAds");

		int rowCount = 0;
		int count	= 0;

		Clip aClip;
		int clipID, mediaID;
		Date lastPlayed;
		String clipName;


		String sql = new String("exec sp_lcGetAds_xsxx "
									+ userID
							+ ", "
									+ mediaType
									);

		try
		{
			DBConnection conn = new DBConnection();
			DBResultSet rs = conn.executeSQL(sql);
			while (!rs.getBOF() && !rs.getEOF() && count < Constants.MAX_ADS)
			{
				ads.addElement(new Clip(rs.getInt("clipID"),
										Clip.TYPE_AD,
										rs.getInt("mediaID"),
										rs.getString("clipName"),
										rs.getDate("lastPlayed")));
				count++;
				rs.next();
				rowCount++;
			}

			conn.close();
		}
		catch (DBException oops)
		{
			Util.debug("DB Exception: " + oops.getMessage());
		}
		Util.debug(Thread.currentThread().getName() + " added " + count + " ads");
```

```
60                  Util.printElapsedTime(Thread.currentThread().getName(), startDate);
            }

    }
```

GetBDSStations

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class GetBDSStations extends Thread
{

        int userID;
        int moodID;
        StationList stations;

        public GetBDSStations(int userID, int moodID, StationList stations)
        {
                this.userID   = userID;
                this.moodID   = moodID;
                this.stations = stations;
        }
        public void run()
        {
                Date startDate = new Date();
                Thread.currentThread().setName("GetBDSStations");

                int rowCount = 0;

                String sql = "sp_lcGetBDSNames_xsxx " + userID + ", " + moodID;

                try
                {

                        DBConnection conn = new DBConnection();

                        DBResultSet rs = conn.executeSQL(sql);
                        while (!rs.getBOF() && !rs.getEOF())
                        {
                                int bdsID = rs.getInt("bdsID");
                                stations.addElement(new Station(bdsID));
                                rowCount++;
                                rs.next();
                        }

                        conn.close();

                }
                catch (DBException oops)
                {
                        Util.debug("DB Exception in GetBDSStations: " + oops.getMessage());
                }

                Util.debug(Thread.currentThread().getName() + " got " + rowCount + " BDS station
subscriptions");
                Util.printElapsedTime(Thread.currentThread().getName(), startDate);
        }
}
```

GetGenres

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class GetGenres extends Thread
{

        GenreList genres;
        int djID;
        int moodID;

        public GetGenres(GenreList genres, int djID, int moodID)
        {
                this.genres = genres;
                this.moodID = moodID;
                this.djID = djID;

        }
        public void run()
        {
                Date startDate = new Date();
                Thread.currentThread().setName("GetGenres");

                int rowCount = 0;

                try
                {
                        DBConnection conn = new DBConnection();

                        DBResultSet rs = conn.executeSQL("exec sp_lcGetGenreNamesForUser_xsxx "
                                                                + djID + ", "
                                                                + moodID);

                        while (!rs.getBOF() && !rs.getEOF())
                        {
                                genres.add((short) rs.getInt("genreID"));
                                rowCount++;
                                rs.next();
                        }

                        conn.close();
                }
                catch (DBException oops)
                {
                        Util.debug("DB Exception: " + oops.getMessage());
                }

                Util.debug(Thread.currentThread().getName() + " added " + rowCount + " genres");
                Util.printElapsedTime(Thread.currentThread().getName(), startDate);
        }
}
```

GetItemRatingsFromDB

```
package com.launch.PlaylistGenerator;
import java.util.*;
public final class GetItemRatingsFromDB extends Thread
{
        private Vector userIDs;
        private Vector results;
    //-------------------------------------------------------------
        public GetItemRatingsFromDB(Vector userIDs, Vector results)
        {
                this.userIDs = userIDs;
                this.results = results;
        }
        public void run()
        {
                Thread.currentThread().setName("GetItemRatingsFromDB");
                Util.debug(Thread.currentThread().getName() + " thread started");
                Date startDate = new Date();

                try
                {
                        String sql = "SELECT iUserID_FK userID, iSourceTableID_L type,
iItemID_FK itemID, tiRating rating FROM a125ItemRating WHERE iUserID_FK IN (" +
RatingsCache.GetVectorAsCommaDelimitedList(userIDs) + ')';
                        DBConnection conn = new DBConnection();
                        DBResultSet rs = conn.executeSQL(sql);
                        CachedRating cr;

                        byte type;
                        while (!rs.getBOF() && !rs.getEOF())
                        {
                                cr = new CachedRating(rs.getInt("userID"), rs.getInt("itemID"),
(byte) rs.getInt("rating"), sourceTableIDToType(rs.getInt("type")));
                                results.addElement(cr);
                                rs.next();
                        }
                        conn.close();
                }
                catch (DBException oops)
                {
                        System.err.println("DBException in GetItemRatingsFromDB: " +
oops.getMessage());
                }
                Util.printElapsedTime(Thread.currentThread().getName(), startDate);
        }

        public final static byte sourceTableIDToType (int type)
        {
                if (type == 260)
                        return Constants.ITEM_TYPE_ARTIST;

                // assume album (243)

                return Constants.ITEM_TYPE_ALBUM;
        }

}
```

GetLastPlayed

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import java.text.DateFormat;
import javax.servlet.ServletOutputStream;
public class GetLastPlayed extends Thread
{
	PlayDates lastPlayed;
	int userID;
	ServletOutputStream out;

	public GetLastPlayed(PlayDates lastPlayed, int userID, ServletOutputStream out)
	{
		this.lastPlayed = lastPlayed;
		this.userID     = userID;
		this.out        = out;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetLastPlayed");

		// returns: songID, lastPlayed

		try
		{
			DBConnection conn = new DBConnection();

			Util.printElapsedTime(Thread.currentThread().getName() + " got a dbConnection",
startDate);
			lastPlayed.load(conn, userID);

			Util.printElapsedTime(Thread.currentThread().getName() + " loaded dates", startDate);
			// this is somewhat expensive, so only do it every so often

			if (Util.random(10) == 1)
			{
				Util.debug("resaving lastPlayed for user " + userID);
				lastPlayed.save(conn);
			}

			conn.close();
		}
		catch (DBException oops)
		{
			Util.debug("DB Exception: " + oops.getMessage());
		}

		Util.out(out, Thread.currentThread().getName() + " loaded " + lastPlayed.size() + " dates");
		Util.printElapsedTime(Thread.currentThread().getName() + "done GetLastPlayed", startDate);
	}
}
```

GetNews

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import java.util.Vector;
public class GetNews extends Thread
{
	Vector news;
	int userID;
	short mediaType;
	int moodID;

	public GetNews(Vector news, int userID, short mediaType, int moodID)
	{
		this.news = news;
		this.userID = userID;
		this.mediaType = mediaType;
		this.moodID = moodID;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetNews");

		int rowCount = 0;
		int count = 0;

		Clip aClip;
		int clipID, mediaID;
		Date lastPlayed;
		String clipName;

		/*
		sp_lcGetNews_xsxx	@userID int, @moodID int, @mediaType int
		returns clipID, clipName, mediaID, lastPlayed

		*/

		String sql = new String("exec sp_lcGetNews_xsxx "
									+ userID
		+ ", "
		+ moodID
			+ ", "
			+ mediaType
			);

		try
		{
			DBConnection conn = new DBConnection();
			DBResultSet rs = conn.executeSQL(sql);
			while(!rs.getBOF() && !rs.getEOF() && count < Constants.MAX_NEWS_ITEMS)
			{
				news.addElement(new Clip(rs.getInt("clipID"),
							Clip.TYPE_NEWS,
							rs.getInt("mediaID"),
							rs.getString("clipName"),
							rs.getDate("lastPlayed")));
				count++;
				rs.next();
				rowCount++;
```

```
60                          }

                            conn.close();
                        }
                        catch (DBException oops)
65                      {
                            Util.debug("DB Exception: " + oops.getMessage());
                        }
                        Util.debug(Thread.currentThread().getName() + " added " + count + " news items");
                        Util.printElapsedTime(Thread.currentThread().getName(), startDate);
70              }

    }
```

GetPlaylist

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class GetPlaylist extends Thread
{
	Population songs;
	int userID;
	SongInfoCache cache;

	public GetPlaylist(Population songs, int userID, SongInfoCache cache)
	{
		this.songs = songs;
		this.userID = userID;
		this.cache = cache;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetPlaylist");

		SongInfo info = null;
		SimpleClip clip;
		int songID;
		int rowCount = 0;

		try
		{
			DBConnection conn = new DBConnection();
			Util.printElapsedTime(Thread.currentThread().getName() + " got a dbConnection",
startDate);
			SimplePlaylist playlist = SimplePlaylist.load(conn, userID);
			if (playlist != null)
			{
				for (int i = 0; i < playlist.songs.size(); i++)
				{
					clip   = (SimpleClip) playlist.songs.elementAt(i);
					songID = clip.ID;

					songs.initSong(songID, Song.EXCLUDED);
					info = (SongInfo) cache.get(songID, SongInfoCache.TYPE_SONG);

					songs.artistCounts.increment(info.album.artist.ID);
					songs.albumCounts.increment(info.album.ID);

					rowCount++;
				}
			}

			conn.close();
		}
		catch (DBException oops)
		{
			Util.debug("DB Exception: " + oops.getMessage());
		}
		Util.debug(Thread.currentThread().getName() + " excluded " + rowCount + " songs");
		Util.printElapsedTime(Thread.currentThread().getName(), startDate);
	}

}
```

GetPlaylistServers

```
package com.launch.PlaylistGenerator;
import java.util.*;
/**
 **/
public final class GetPlaylistServers extends Thread
{
        public static int SLEEP_TIME = (3600*1000); // every hour
        public static int EXPECTED_SERVER_COUNT = 10;
        private GetPlaylistServersInterface personToNotify;
    //-------------------------------------------------------------
        /**
         * @param personToNotify must not be null.
         **/
        public GetPlaylistServers(GetPlaylistServersInterface personToNotify)
        {
                this.personToNotify=personToNotify;
        }
        public void run()
        {
                Thread.currentThread().setName("getPlaylistServers");
                Util.debug(Thread.currentThread().getName() + " thread started");
                DBConnection conn;
                DBResultSet rs;
                Vector v;
                Date benchmark_date;
                try
                {
                        while (personToNotify!=null)
                        {
                                benchmark_date=new Date();
                                v=new Vector(EXPECTED_SERVER_COUNT);
                                conn = new DBConnection();
                                rs = conn.executeSQL("exec sp_lcGetRatingsCacheServers_xsxd");
                                while (!rs.getBOF() && !rs.getEOF())
                                {
                                        v.addElement(rs.getString("server"));
                                        rs.next();
                                }
                                conn.close();
                                personToNotify.updatePlaylistServers(v);
                                Util.printElapsedTime(Thread.currentThread().getName() + ", get " +
v.size() + " rows", benchmark_date);
                                Thread.sleep(SLEEP_TIME);
                        }
                }
                catch (Exception e)
                {
                        System.err.println(new Date().toString() + " Fatal Exception in
GetPlaylistServers:" + e.toString());
                }
                Util.debug(Thread.currentThread().getName() + " thread done");
        }
}
```

GetPlaylistServersInterface

```
package com.launch.PlaylistGenerator;
import java.util.*;
public interface GetPlaylistServersInterface
{
        /**
         * @param playlistServers will be a vector of strings, each string is an ip address of the form
xxx.xxx.xxx.xxx
         **/
        public void updatePlaylistServers(Vector playlistServers);
}
```

GetPopular

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class GetPopular extends Thread
{
	Population songs;
	SongList list;

	public GetPopular(Population songs, SongList list)
	{
		this.songs	= songs;
		this.list	= list;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetPopular");
		Song ditty;
		SongData data;
		SongInfo info;

		int rowCount = 0;

		if (list != null)
		{
			for (int i = 0; i < list.size(); i++)
			{

				info = list.elementAt(i);

				data = songs.getSongData(info.songID);

				if (data != null)
				{
					// we can't add it, but let's append the info while we're here

					data.setInfo(info);
				}
				else
				{
					data = songs.initSongGetData(info.songID, Song.UNRATED);

					if (data != null)
					{
						data.querySource = data.SOURCE_POPULAR;
						data.setInfo(info);
					}
					rowCount++;
				}
			}

		}
		Util.debug(Thread.currentThread().getName() + " added " + rowCount + " songs");
		Util.printElapsedTime(Thread.currentThread().getName(), startDate);
	}

}
```

GetRatings

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import java.util.Vector;
import java.util.Enumeration;
import javax.servlet.ServletOutputStream;
public class GetRatings extends Thread
{
	ItemsProfile profile;
	int userID;
	DJList djs;
	Population songs;
	SongInfoCache cache;
	ServletOutputStream out;

	public GetRatings(Population songs, ItemsProfile profile, int userID, DJList djs, SongInfoCache cache,
ServletOutputStream out)
	{
		this.profile = profile;
		this.userID  = userID;
		this.djs     = djs;
		this.cache   = cache;
		this.songs   = songs;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetRatings");

		int rowCount = 0;

		// make a users vector from the users and djs

		Vector users = djs.asIDVector();
		users.addElement(new Integer(userID));
		Util.out(out, "GetRatings getting ratings for users " + users.toString());

		Vector ratings = cache.ratingsCache.getRatings(users);

		Util.printElapsedTime("GetRatings after all ratings retreived", startDate);

		CachedRating cached;
		int djID, itemID;
		byte rating, type;
		SongData data;
		short songType = Song.EXPLICIT;
		SongInfo info;
		int artistID;
		Item theItem;

		int songRatings = 0;
		int itemRatings = 0;

		int userSongRatings = 0;
		int userItemRatings = 0;
		int djSongRatings = 0;
		int djItemRatings = 0;

		for (Enumeration e = ratings.elements(); e.hasMoreElements() ;)
```

```
60                  {
                        cached = (CachedRating) e.nextElement();

                        djID   = cached.userID;
                        itemID = cached.itemID;
65                      rating = cached.rating;
                        type   = cached.type;
                        // 0 is not a valid userId
                        // ratings < 0 mean it was unrated
                        if (djID != 0 || rating < 0)
70                      {

                            if (type == Constants.ITEM_TYPE_SONG)
                            {
                                songRatings++;
75
                                // store the user's rating
                                if (userID == djID)
                                {

80                                  userSongRatings++;

                                    if (rating == 0)
                                    {
                                        songs.initSong(itemID, Song.EXCLUDED);
85                                      info = (SongInfo) cache.get(itemID,
SongInfoCache.TYPE_SONG);

                                        addToAverage(info, 0);
                                    }
                                    else
90                                  {

                                        data = songs.initSongGetData(itemID, songType);
                                        if (data != null)
                                        {
95
                                            info = (SongInfo) cache.get(itemID,
SongInfoCache.TYPE_SONG);

                                            // if the song isn't in the cache, it's not
100 encoded

                                            // and we can't play it
                                            if (info == null)
                                            {
                                                songs.initSong(itemID,
105 Song.EXCLUDED);

                                            }
                                            else
                                            {
                                                data.setInfo(info);
110                                             data.querySource =
SongData.SOURCE_RATED;

                                                data.rating.set(rating,
SongRating.RATING_SOURCE_EXPLICIT);

115                                             // add this rating to all ratings by
this user for the artist

                                                addToAverage(info, rating);
                                            }
                                        }
120                                 }
```

```
                                        }
                                        else // this is another user's song rating
                                        {

                                                djSongRatings++;

                                                data = songs.initSongGetData(itemID, Song.UNRATED);

                                                if (data != null)
                                                {
                                                        data.querySource = SongData.SOURCE_DJS;

                                                        data.djsAverage.add(rating);
                                                }

                                        }

                                }
                                // don't count various artists ratings
                                else if (!(type == Constants.ITEM_TYPE_ARTIST &&
ArtistInfo.isVariousArtists(itemID)))
                                {

                                        itemRatings++;

                                        theItem = profile.put(itemID);

                                        if (djID == userID)
                                        {
                                                userItemRatings++;
                                                theItem.userRating.set(rating);
                                        }
                                        else
                                        {
                                                djItemRatings++;
                                                theItem.djsAverage.add(rating);
                                        }
                                }
                        }

                        rowCount++;
                }

                Util.out(out, Thread.currentThread().getName() + " added "
                                        + songRatings + " song ratings ("
                                        + userSongRatings + " user, "
                                        + djSongRatings + " dj) "
                                        + "and " + itemRatings + " item ratings ("
                                        + userItemRatings + " user, "
                                        + djItemRatings + " dj)"
                                );
                Util.printElapsedTime(Thread.currentThread().getName(), startDate);
        }

        private void addToAverage(SongInfo info, int rating)
        {
                if (info != null)
                {
                        (profile.put(info.album.artist.ID)).songAverage.add(rating);
                }
        }
```

```
        private String userCriteria()
        {
185
                if (djs.size() <= 0)
                        return " = " + userID;

                return "IN (" + userID + ", " + djs.inList() + ")";
190
        }
}
```

GetRatingsCacheUsers

```
package com.launch.PlaylistGenerator;
import java.util.*;
import java.net.*;
/**
 **/
public final class GetRatingsCacheUsers extends Thread
{
		private static int SLEEP_TIME = (10 * 60 * 1000); // update every 10 minutes
		private static int EXPECTED_TOP_USER_SIZE = 100;
		private GetRatingsCacheUsersInterface personToNotify;
		private static final int UPDATE_DB_CACHED_USERS_SLEEP_COUNT = 6 * 8; // three
times every day (6*8*SLEEP_TIME)
	//-------------------------------------------------------------
		/**
		 * @param personToNotify must not be null.
		 **/
		public GetRatingsCacheUsers(GetRatingsCacheUsersInterface personToNotify)
		{
			this.personToNotify = personToNotify;
		}
		public void run()
		{
			Thread.currentThread().setName("GetRatingsCacheUsers");
			Util.debug(Thread.currentThread().getName() + " thread started");
			DBConnection conn;
			String myIP;
			DBResultSet rs;
			Vector v;
			Date benchmark_date;
			try
			{
				myIP = InetAddress.getLocalHost().getHostAddress();
				int update_db_users_list =
UPDATE_DB_CACHED_USERS_SLEEP_COUNT;
				while (personToNotify != null)
				{
					benchmark_date = new Date();
					v = new Vector(EXPECTED_TOP_USER_SIZE);
					conn = new DBConnection();
					rs = conn.executeSQL("exec sp_lcGetUsersToCache_isxd '" + myIP
+ "\");
					while (!rs.getBOF() && !rs.getEOF())
					{
						v.addElement(new Integer(rs.getInt("userID")));
						rs.next();
					}
					personToNotify.updateCachedUsers(v);
					Util.printElapsedTime(Thread.currentThread().getName() + ", get " +
v.size() + " rows", benchmark_date);
					Thread.sleep(SLEEP_TIME);
					//---
					if (update_db_users_list <= 0)
					{
						// do the update

						Util.debug(new Date().toString() + " Updating
RatingsCacheUserList");
```

```
                                        try
                                        {
                                                Hashtable h =
personToNotify.getMostFrequentlyUsedUsers(EXPECTED_TOP_USER_SIZE);

                                                if (h != null && h.size() > 0)
                                                {
                                                        String the_command = "exec
sp_lcDeleteRatingsCacheUsers_xxxd";

                                                        conn.executeSQL(the_command);
                                                        Enumeration e = h.keys();
                                                        while (e.hasMoreElements())
                                                        {
                                                                the_command = "exec
sp_lcAddRatingsCacheUser_ixxx " + e.nextElement();
                                                                conn.executeSQL(the_command);
                                                        }
                                                }

                                                conn.close();
                                        }
                                        catch (DBException dbe)
                                        {
                                                System.err.println(new Date().toString() + "
DBException in GetRatingsCacheUsers: " + dbe.toString());
                                                dbe.printStackTrace();
                                        }

                                        update_db_users_list =
UPDATE_DB_CACHED_USERS_SLEEP_COUNT;
                                }
                                else
                                {
                                        Util.debug("update_db_users_list is " +
update_db_users_list);
                                        update_db_users_list--;
                                }
                                //---

                                conn.close();
                        }
                }
                catch (Exception e)
                {
                        System.err.println(new Date().toString() + " Fatal Exception in
GetRatingsCacheUsers: " + e.getMessage());
                        e.printStackTrace();
                }
                Util.debug(Thread.currentThread().getName() + " thread done");
        }
}
```

GetRatingsCacheUsersInterface

```
package com.launch.PlaylistGenerator;
import java.util.*;
public interface GetRatingsCacheUsersInterface
{
        /**
         * @param topUsers will be a vector of Integers, where each integer is a userID
         **/
        public void updateCachedUsers(Vector topUsers);

        /**
         * This method will return a hash of (Integer USERID, Intger Requests)
         * @param i is the number of users to get
         * @return null if no statistics
         **/
        public Hashtable getMostFrequentlyUsedUsers(int i);
}
```

GetRecentlyPlayed

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class GetRecentlyPlayed extends Thread
{
	Population songs;
	int userID;

	public GetRecentlyPlayed(Population songs, int userID)
	{
		this.songs = songs;
		this.userID = userID;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("GetRecentlyPlayed");

		int rowCount = 0;

		String sql = new String("exec sp_lcGetRecentlyPlayedSongs_xsxx "
+ userID);

		int songID, albumID, artistID;

		try
		{
			DBConnection conn = new DBConnection();
			DBResultSet rs = conn.executeSQL(sql);
			while(!rs.getBOF() && !rs.getEOF())
			{

				// returns songID, albumID, artistID, lastPlayed

				albumID  = rs.getInt("albumID");
				songID   = rs.getInt("songID");
				artistID = rs.getInt("artistID");

				// don't play these songs so soon again
				songs.initSong(songID, Song.EXCLUDED);

				songs.artistCounts.increment(artistID);
				songs.albumCounts.increment(albumID);

				rs.next();
				rowCount++;
			}

			conn.close();

		}
		catch (DBException oops)
		{
			Util.debug("DBException: " + oops.getMessage());
		}

		Util.debug(Thread.currentThread().getName() + " added " + rowCount + " songs");
		Util.printElapsedTime(Thread.currentThread().getName(), startDate);
	}
```

```
60
    }
```

GetSongInfoServlet

```
package com.launch.PlaylistGenerator;
import java.util.*;
import java.io.*;
import java.net.*;
import javax.servlet.*;
import javax.servlet.http.*;
/**
*-------------------------------------------------------------------
*
* GetSongInfoServlet
* @author Jeff Boulter
*-------------------------------------------------------------------
*/
public class GetSongInfoServlet extends HttpServlet
{
	public static final byte ONLINE_TIMEOUT = 10;
	//----------------------
	/**
	 * Handle requests...
	 */
	public void doGet (
		HttpServletRequest		request,
		HttpServletResponse		response
		) throws ServletException, IOException
	{
		String userID;
		String volume;
		String djID;
		String djName;
		String djPosessive;
		String songName = "";
		String albumName = "";
		String artistName = "";
		int songID = 0;
		int albumID = 0;
		int artistID = 0;
		int commRating = 0;
		Date dateAdded = new Date();
		byte origin = 0;
		int mediaID = 0;
		int year = 0;
		int songRating = -1;
		int albumRating = -1;
		int artistRating = -1;
		// get stream for output
		ServletOutputStream out;
		response.setContentType("text/html");
		out = response.getOutputStream();
		response.setHeader("Pragma", "no-cache");
		response.setHeader("Cache-control", "no-cache");
		response.setHeader("Expires", "0");
		try
		{
			userID = request.getParameter("rater");
			if (userID == null)
			{
				out.println("no userID passed");
				return;
```

```
60                                  }
                                    DBConnection conn = new DBConnection();
                                    djID   = request.getParameter("djID");
                                    djName = request.getParameter("djName");
                                    if (djID == null || djID.equals(userID))
65                                  {
                                            djName = "You";
                                            djPosessive = "Your";
                                    }
                                    else
70                                  {
                                            djPosessive = djName + "'s";
                                    }
                                    DBResultSet rs = conn.executeSQL("exec sp_lcGetPlayingInfoForUser_xsxx "
    + userID);
75                                  while (!rs.getBOF() && !rs.getEOF())
                                    {
                                            songName   = rs.getString("song");
                                            albumName  = rs.getString("album");
                                            artistName = rs.getString("artist");
80                                          songID     = rs.getInt("songID");
                                            albumID    = rs.getInt("albumID");
                                            artistID   = rs.getInt("artistID");
                                            commRating = rs.getInt("commRating");
                                            if (commRating <= 0) { commRating = -1;}
85                                          origin     = (byte) rs.getInt("origin");
                                            mediaID    = rs.getInt("mediaID");
                                            year       = rs.getInt("year");
                                            dateAdded  = rs.getTimestamp("dateAdded");
                                            songRating   = rs.getInt("songRating");
90                                          albumRating  = rs.getInt("albumRating");
                                            artistRating = rs.getInt("artistRating");
                                            rs.next();
                                    }
                                    int exclusive = isExclusive(albumName);
95                                  int newStatus = isNew(dateAdded);
                                    int popular   = isPopular(commRating);
                                    String djs = "";

                                    if (origin == SongData.SOURCE_DJS_ALBUM)
100                                         djs = djRatings(conn, userID, albumID,
    Constants.ITEM_TYPE_ALBUM);
                                    else if (origin == SongData.SOURCE_DJS_ARTIST)
                                            djs = djRatings(conn, userID, artistID,
    Constants.ITEM_TYPE_ARTIST);
105                                 else
                                            djs = djRatings(conn, userID, songID,
    Constants.ITEM_TYPE_SONG);

                                    out.print(
110                                                   "media_id=" + mediaID + "&"
                                                    + "song_id=" + songID + "&"
                                                    + "song_name=" + escape(songName) + "&"
                                                    + "album_id=" + albumID + "&"
                                                    + "album_name=" + escape(albumName +
115 formatAlbumYear(year)) + "&"
                                                    + "artist_id=" + artistID + "&"
                                                    + "artist_name=" + escape(artistName) + "&"
                                                    + "exclusive=" + exclusive + "&"
                                                    + "comm_rating=" + commRating + "&"
120                                                 + "new=" + newStatus + "&"
```

```
                                                + "origin=" + escape(SongData.originText(origin, djName,
djPosessive)) + "&"
                                                + "popular=" + popular + "&"
                                                + "song_rating=" + songRating + "&"
                                                + "song_rating_type=1" + "&"
                                                + "album_rating=" + albumRating + "&"
                                                + "album_rating_type=1" + "&"
                                                + "artist_rating=" + artistRating + "&"
                                                + "artist_rating_type=1"
                                                + djs

                                                + fans(conn, songID)
                                                + radioStations(conn, userID, songID)
                                                + "&ticker_text=&image_url=" // not used
                                        );

                                volume = request.getParameter("volume");
                                saveVolume(conn, userID, volume);
                                conn.close();
                        }
                        catch (DBException e)
                        {
                                System.err.println("DBException: " + e.getMessage());
                                e.printStackTrace();
                        }
                        catch (Exception e)
                        {
                                out.println("Exception raised: " + e);
                                e.printStackTrace();
                        }
                        out.close();
                }
                private void saveVolume(DBConnection conn, String userID, String volumeStr) throws
DBException
                {
                        if (volumeStr == null)
                                return;
                        double volume = 0;
                        try
                        {
                                Double dblVolume = new Double(volumeStr);
                                if (dblVolume != null)
                                        volume = dblVolume.doubleValue();
                        }
                        catch (Exception e)
                        {
                                return;
                        }
                        if (volume > 0 && volume <= 100)
                        {
                                conn.executeSQL("exec sp_lcSetVolume_isux " + userID + ", " + volume);
                        }
                }
                private String djRatings(DBConnection conn, String userID, int itemID, String storedProc,
String variableName) throws DBException
                {
                        String result = "";
                        String djName;
                        String ratingStr;
                        int rating;
                        int count = 1;
```

```
                        DBResultSet rs = conn.executeSQL("exec " + storedProc + " " + userID + ", " +
itemID);
                        while (!rs.getBOF() && !rs.getEOF())
185                     {
                                rating = rs.getInt("rating");
                                if (rating <= 0)
                                {
                                        ratingStr = "X";
190                             }
                                else
                                {
                                        ratingStr = "" + rating;
                                }
195                             result = result.concat(
                                          "&" + variableName + "_name"   + count + "=" +
escape(rs.getString("alias"))
                                        + "&" + variableName + "_id"     + count + "=" + rs.getInt("userID")
                                        + "&" + variableName + "_value"  + count + "=" + ratingStr
200                                     + "&" + variableName + "_online" + count + "=" +
isOnline(rs.getInt("minutesSincePlay"))
                                );
                                count++;
                                rs.next();
205                     }

                        return result;
                }

210             private String djRatings(DBConnection conn, String userID, int itemID, byte itemType) throws
DBException
                {
                        if (itemType == Constants.ITEM_TYPE_SONG)
                        {
215                             return djRatings(conn, userID, itemID,
"sp_lcGetUserDJRatingsForSongID_xsxx", "dj_rating");
                        }
                        else if (itemType == Constants.ITEM_TYPE_ALBUM)
                        {
220                             return djRatings(conn, userID, itemID,
"sp_lcGetUserDJRatingsForAlbumID_xsxx", "dj_rating");
                        }
                        else if (itemType == Constants.ITEM_TYPE_ARTIST)
                        {
225                             return djRatings(conn, userID, itemID,
"sp_lcGetUserDJRatingsForArtistID_xsxx", "dj_rating");
                        }

                        return "";
230             }

                private String radioStations(DBConnection conn, String userID, int songID) throws
DBException
                {
235                     int count = 0;
                        String result = "";
                        DBResultSet rs = conn.executeSQL("exec
sp_lcGetSubscribedBDSStationsPlayingSong_xsxx " + userID + ", " + songID);
                        while (!rs.getBOF() && !rs.getEOF())
240                     {
                                result = result.concat(
                                          "&radio_id"   + count + "=" + rs.getInt("bdsStationID")
```

```
                                        + "&radio_name" + count + "=" + escape(rs.getString("callLetters") +
" " + rs.getString("description"))
                                );
                                count++;
                                rs.next();
                        }
                        return result;
                }
                private String fans(DBConnection conn, int songID) throws DBException
                {
                        String result = "";
                        int count = 1;
                        int rating;
                        String ratingStr = "";
                        DBResultSet rs = conn.executeSQL("exec sp_lcGetFans_xsxx " + songID);
                        while (!rs.getBOF() && !rs.getEOF() && count <= 5)
                        {
                                result = result.concat(
                                        "&fan_name"   + count + "=" + escape(rs.getString("alias"))
                                        + "&fan_id"     + count + "=" + rs.getInt("userID")
                                        + "&fan_online" + count + "=" +
isOnline(rs.getInt("minutesSincePlay"))
                                );
                                count++;
                                rs.next();
                        }
                        if (count > 1 && !rs.getEOF())
                        {
                                result = result.concat("&fan_id" + count + "=0" + "&fan_name" + count +
"=more...");
                        }
                        return result;
                }

                private String formatAlbumYear(int year)
                {
                        if (year > 0)
                        {
                                return " (" + year + ")";
                        }
                        return "";
                }
                private int isExclusive(String albumName)
                {
                        if (albumName != null)
                        {
                                if (albumName.indexOf("Launch Live") > -1)
                                {
                                        return 1;
                                }
                        }
                        return 0;
                }
                private int isOnline (int lastPlay)
                {
                        if (ONLINE_TIMEOUT > lastPlay)
                        {
                                return 1;
                        }
                        return 0;
                }
```

```
                private int isPopular (int commRating)
305             {
                        if (commRating > Constants.POPULAR_THRESHOLD)
                        {
                                return 1;
                        }
310                     return 0;
                }
                private int isNew (Date dateAdded)
                {
                        if (dateAdded == null)
315                     {
                                return 0;
                        }
                        long twoWeeks = Util.MILLISECONDS_IN_SECOND *
                                                        Util.SECONDS_IN_MINUTE    *
320                                                     Util.MINUTES_IN_HOUR      *
                                                        Util.HOURS_IN_DAY         *
                                                        14;
                        Date now = new Date();
                        if (now.getTime() - dateAdded.getTime() < twoWeeks)
325                     {
                                return 1;
                        }
                        return 0;
                }
330             private String escape(String thing)
                {
                        if (thing == null)
                        {
                                return "";
335                     }
                        return URLEncoder.encode(thing);
                }
                public void init (ServletConfig config)
                        throws ServletException
340             {
                        super.init(config);
                }
                public void destroy()
                {
345             }
}
/* eof */
```

GetSongRatingsFromDB

```
package com.launch.PlaylistGenerator;
import java.util.*;
public final class GetSongRatingsFromDB extends Thread
{
        private Vector userIDs;
        private Vector results;
    //-------------------------------------------------------------
        public GetSongRatingsFromDB(Vector userIDs, Vector results)
        {
                this.userIDs = userIDs;
                this.results = results;
        }
        public void run()
        {
                Thread.currentThread().setName("GetSongRatingsFromDB");
                Util.debug(Thread.currentThread().getName() + " thread started");
                Date startDate = new Date();

                try
                {
                        String sql = "SELECT iUserID_FK userID, iSongID_FK songID, iRating
rating FROM a200SongRating WHERE iUserID_FK IN (" +
RatingsCache.GetVectorAsCommaDelimitedList(userIDs) + ')';
                        DBConnection conn = new DBConnection();
                        DBResultSet rs = conn.executeSQL(sql);
                        CachedRating cr;
                        while (!rs.getBOF() && !rs.getEOF())
                        {
                                cr = new CachedRating(rs.getInt("userID"), rs.getInt("songID"),
(byte)rs.getInt("rating"), Constants.ITEM_TYPE_SONG);
                                results.addElement(cr);
                                rs.next();
                        }
                        conn.close();
                }
                catch (DBException oops)
                {
                        System.err.println("DBException in GetSongRatingsFromDB: " +
oops.getMessage());
                }
                Util.printElapsedTime(Thread.currentThread().getName(), startDate);
        }
}
```

IntHash

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
/**
 * A hashtable that uses ints as keys and values.
 */
public class IntHash extends Hashtable
{
	public synchronized int get(int key)
	{
		Object thing = get(new Integer(key));

		if (thing == null)
			return 0;
		else
			return ((Integer) thing).intValue();
	}
	public synchronized int put(int key, int value)
	{
		put(new Integer(key), new Integer(value));

		return value;
	}

	private synchronized int change(int key, int valueChange)
	{
		return put(key, get(key) + valueChange);
	}

	public synchronized int increment(int key)
	{
		return change(key, 1);
	}
	public synchronized int decrement(int key)
	{
		return change(key, -1);
	}
	public synchronized int increment(int key, int howMuch)
	{
		return change(key, howMuch);
	}
	public synchronized int decrement(int key, int howMuch)
	{
		return change(key, -howMuch);
	}


}
```

Item

```
package com.launch.PlaylistGenerator;
public class Item
{

        public final static byte TYPE_ANY     = 0;
        public final static byte TYPE_ALBUM   = 1;
        public final static byte TYPE_ARTIST  = 2;
        public final static byte TYPE_UNKNOWN = 10;

        public int itemID;
        public Rating userRating;
        private boolean songAvgScoreCalculated = false;

        private double songAvgScore;

        // the average rating from all djs for this tiem
        public AverageRating djsAverage;

        // average rating of all songs by an artist
        public AverageRating songAverage;

        public double songAverageScore(ArtistInfo info)
        {

                if (!songAvgScoreCalculated)
                {
                        songAvgScoreCalculated = true;

                        double songsByArtist = Math.min(info.songs.size(),
Constants.MAX_SONGS_BY_ARTIST);
                        double songsRated    = Math.min(songAverage.count(),
Constants.MAX_SONGS_BY_ARTIST);

                        // deviation from the average
                        songAvgScore = ((songAverage.get() - Constants.DEFAULT_RATING)
                                * (songsRated / songsByArtist)) + Constants.DEFAULT_RATING;
                }

                return songAvgScore;
        }

        public boolean inGenres = false;

        public byte getType()
        {
                if (itemID == 0)
                        return TYPE_UNKNOWN;
                else if (itemID < 1000000)
                        return TYPE_ALBUM;
                else
                        return TYPE_ARTIST;
        }

        public String typeName()
        {
                byte type = getType();

                if (type == TYPE_ALBUM)
```

```
60                      return "Album";
                else if (type == TYPE_ARTIST)
                        return "Artist";
                else
                        return "Unknown";
65
        }

        public Item()
        {
70              userRating  = new Rating();
                djsAverage  = new AverageRating();
                songAverage = new AverageRating();
        }

75      public Item(int itemID)
        {
                this();
                this.itemID = itemID;
        }
80
        public String toString(SongInfoCache cache)
        {

                String title = "(Not available)";
85              byte type = getType();


                if (type == TYPE_ARTIST)
                {
90                      ArtistInfo artist = (ArtistInfo) cache.get(itemID, SongInfoCache.TYPE_ARTIST);

                        if (artist != null)
                                title = artist.title;
                }
95              else if (type == TYPE_ALBUM)
                {
                        AlbumInfo album = (AlbumInfo) cache.get(itemID, SongInfoCache.TYPE_ALBUM);

                        if (album != null)
100                             title = album.title;
                }

                return typeName() + " \"" + title + "\" (" + itemID + ") "
                        + "user=" + userRating.toString()
105                     + " djs=" + djsAverage.toString()
                  + " songAverage=" + songAverage.toString()
                        + " songAvgScore=" + songAvgScore;

        }
110
}
```

ItemsProfile

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
import java.util.Enumeration;
import javax.servlet.ServletOutputStream;
public class ItemsProfile
{

	private Hashtable hash;

	public ItemsProfile()
	{
		hash = new Hashtable();
	}

	public synchronized Item get(int itemID)
	{
		return get(new Integer(itemID));
	}

	public synchronized Item get(Integer itemID)
	{
		return (Item) hash.get(itemID);
	}

	/**
	 * puts a new item in the hash and returns it.
	 * If it's already there, just return it
	 */
	public synchronized Item put(int itemID)
	{
		Integer ID = new Integer(itemID);

		Item it = get(ID);

		if (it == null)
		{
			it = new Item(itemID);
			hash.put(ID, it);
			return it;
		}
		else
			return it;
	}
	public void print(ServletOutputStream out, SongInfoCache cache)
	{
		for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {

			Item anItem = get((Integer) e.nextElement());

			Util.out(out, anItem.toString(cache));
		}

	}

	public String inList(byte type)
	{
		String list = "";
```

```
60                      for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {

                                Item anItem = get((Integer) e.nextElement());

                                if (type == Item.TYPE_ANY || anItem.getType() == type)
65                              {
                                        list = list.concat(anItem.itemID + ",");
                                }
                        }
                        // remove that extra comma
70                      if (list.length() > 0)
                                list = list.substring(0, list.length() - 1);

                        return list;

75              }
        }
```

Media

```
package com.launch.PlaylistGenerator;
public class Media
{
    int mediaID;
    short mediaType;
    String filepath;

    public Media(int mediaID, short mediaType, String filepath)
    {
        this.mediaID   = mediaID;
        this.mediaType = mediaType;
        this.filepath  = filepath;
    }

    public String toString()
    {
        return mediaType + ": " + mediaID;
    }
    public static short getMediaType(Bandwidth speed, MediaFormat format)
    {
        if (format.get() == MediaFormat.WINDOWSMEDIA)
        {
            if (speed.get()     == Bandwidth.SPEED_28)
                return 211;
            else if (speed.get() == Bandwidth.SPEED_56)
                return 147;
            else if (speed.get() >= Bandwidth.SPEED_100)
                return 212;
            else
                return 0;
        }

        return 0;
    }

    public static Bandwidth typeToBandwidth(short mediaType)
    {
        if (mediaType == 211)
            return new Bandwidth(Bandwidth.SPEED_28);
        else if (mediaType == 147)
            return new Bandwidth(Bandwidth.SPEED_56);
        else if (mediaType == 212)
            return new Bandwidth(Bandwidth.SPEED_100);

        return new Bandwidth();
    }

}
```

MediaFormat

```
package com.launch.PlaylistGenerator;
public class MediaFormat
{
    public final static byte WINDOWSMEDIA = 1;
    public final static byte REALMEDIA    = 2;
    public final static byte QUICKTIME    = 3;

    private boolean beenset = false;

    private byte value;

    // when we start supporting more than one format, just take this out
    public MediaFormat()
    {
        value = WINDOWSMEDIA;
        beenset = true;
    }

    public MediaFormat(byte format)
    {
        value = format;
        beenset = true;
    }

    public byte get()
    {
        return value;
    }

    public void set(byte format)
    {
        value = format;
        beenset = true;
    }

    public boolean isSet()
    {
        return beenset;
    }

    public String toString()
    {
        if (value == WINDOWSMEDIA)
            return "WindowsMedia";
        else if (value == REALMEDIA)
            return "RealMedia";
        else if (value == QUICKTIME)
            return "QuickTime";

        return "UNKNOWN";
    }
}
```

MediaGatewayServlet

```
package com.launch.PlaylistGenerator;
import java.io.*;
import java.net.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.util.*;
/**
*---------------------------------------------------------------------
* PlaylistGeneratorServlet.java 8/16/99
* Servlet that redirects to media
* Copyright (c) 1999 Launch, Inc.
* @author Jeff Boulter
*---------------------------------------------------------------------
*/
public final class MediaGatewayServlet extends HttpServlet
{
	/** what browser signature we look for */
	private static final String mpSignature = "NSPlayer";
	/** when we get an unauthorized browser, play this */
	private static final String unauthorizedBrowser = "audio/errors/unauthorizedbrowser.asf";
	/** when we get an unauthorized user, play this */
	private static final String unauthorizedUser = "audio/errors/unauthorizeduser.asf";
	/** when we get an unauthorized user, play this */
	private static final String outOfMedia = "audio/errors/outofmedia.asf";
	/** how many tries we take to get media */
	private static final int MAX_ITERATIONS = 5;
	/** this is the header that media player uses toe indicate which query it is */
	private static final String CONTEXT_TAG = "request-context=";
	/** To work around a problem with reading multiple headers with the same name in servlet 2.0 + jrun, we
look for these headers to determine the context */
	private static final String FIRST_REQUEST_PRAGMA  = "xClientGUID";
	private static final String SECOND_REQUEST_PRAGMA = "stream-switch-entry";
	private static final String REQUEST_CONTEXT = "request-context=";
	private static final int STREAMING_MEDIA_TIMEOUT=1000*60*15;
	/**
	 * Handle requests...
	 */
	public final void doGet (HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException
	{
//		Util.debug("MediaRedirectServlet:doGet() received a request");
		DBConnection conn = null;
		ServletOutputStream out = null;
		int context;
		int userID = -1;
		boolean debug=false;
		try
		{
			// get connections and streams
			conn = new DBConnection();
			out  = response.getOutputStream();
			// get parameters from http
			debug = (request.getParameter("ralph") != null);
			// setup response data
			setResponseHeaders(response);
			setResponseContentType(response, debug);
			// get parameters from http
			userID = Integer.parseInt(request.getParameter("u"));
```

```
60                          if (!checkUserAgent(request.getHeader("USER_AGENT"), debug, out))
                            {
                                    return;
                            }
                            // muck with clip and clip schedule
65                          ClipSchedule schedule = new ClipSchedule(userID);
                            schedule.init(conn);  //db call 1
                            Clip aClip = null;
                            int iteration;
                            boolean done = false;
70                          // keep going until we get a good path

                            for (iteration = 0; iteration < MAX_ITERATIONS && !done; iteration++)
                            {
                                    aClip = new Clip(schedule.nextClipType(debug, out));
75
                                    if (aClip == null || aClip.type() == Clip.TYPE_NONE)
                                    {
                                            done = true;
                                            System.err.println("user " + userID + " is out of songs to play");
80
                                    }
                                    else
                                    {
                                            // get the paths and stuff
85                                          aClip.getPath(conn, schedule); // db call 2
                                            if (aClip.isSet())
                                            {
                                                    done = true;
                                            }
90                                          else
                                            {
                                                    done = true;
                                                    System.err.println("user " + userID + " is out of media of
type " + aClip.typeName() + " to play");
95                                          }
                                    }
                            }

                            // update the playlist
100                         schedule.playlist.save(conn, userID); // db call 3

                            if (aClip == null)
                                    out.println(Constants.STREAM_SERVER + "/" + outOfMedia);
                            else
105                         {

                                    // log the play
                                    aClip.logPlay(conn, userID); // db call 4

110                                 // get the URL
                                    out.println(aClip.URL());
                            }
                    }
                    catch (NumberFormatException e)
115                 {
                            out.println("Bad userId");
                            // print out the MMS path to redirect to
                            if (debug)
                            {
120                                 out.println("redirecting to " + unauthorizedUser);
```

```
                        }
                        else
                        {
                                out.println(Constants.STREAM_SERVER + "/" + unauthorizedUser);
                        }
                }
                catch (Throwable e)
                {
                        System.err.println("Generic Exception in MediaGateway for userID " + userID + ": " +
e.getMessage());
                        e.printStackTrace();
                }
                finally
                {
                        try
                        {
                                if (out!=null)
                                {
                                        out.close();
                                }
                                if (conn!=null)
                                {
                                        conn.close();
                                }
                        }
                        catch (SocketException se)
                        {
                                // don't do anything, the person disconnected, no error, (or mediaplayer
sampled first 32 bytes.)
                        }
                        catch (Exception e1)
                        {
                                e1.printStackTrace();
                        }
                }
        }
        private final boolean checkUserAgent(String agent, boolean debug, ServletOutputStream out) throws
IOException
  {
                if (!(agent!=null && agent.startsWith(mpSignature)))
                {
                        if (debug)
                        {
                                out.println("invalid useragent. Would stream " + unauthorizedBrowser);
                                return true;
                        }
                        else
                        {
                                out.println(Constants.STREAM_SERVER + "/" + unauthorizedBrowser);
                        }
                        return(false);
                }
                else
                {
                        return(true);
                }
        }
        private final void setResponseContentType(HttpServletResponse response, boolean debug)
        {
                if (debug)
                {
```

```
                        response.setContentType("text/plain");
                }
                else
                {
                        response.setContentType("video/x-ms-asf");
                }
        }
        private final void setResponseHeaders(HttpServletResponse response)
        {
                response.setHeader("Pragma", "no-cache");
                response.setHeader("Cache-control", "no-cache");
                response.setHeader("Expires", "0");
        }
/*
        private static final void readFileToOutputStream(String filename, HttpServletResponse response, boolean
debug)
        {
                readFileToOutputStream(new File(filename), response, debug);
        }
        private static final void readFileToOutputStream(File the_file, HttpServletResponse response, boolean
debug)
        {
                try
                {
                        BufferedInputStream bis=new BufferedInputStream(new FileInputStream(the_file));
                        BufferedOutputStream bos=new BufferedOutputStream(response.getOutputStream());
                        bos.flush(); //this is to ward off any problems I think there might be a jrun problem with
initializing the output stream fast enough, i.e. before we get there...
                        BufferedWriter br=new BufferedWriter(new OutputStreamWriter(bos));
                        if (debug)
                                Util.out(response.getOutputStream(), "streaming file " + the_file + " of size " +
the_file.length());
                        else
                                response.setContentLength((int)the_file.length());
                        // System.err.println("streaming file " + the_file + " of size " + the_file.length());
                        RedirectStream redirecting_stream=new RedirectStream(bis, bos, debug,
response.getOutputStream());
                        redirecting_stream.start();
                        redirecting_stream.join(STREAMING_MEDIA_TIMEOUT, 0);
                        if (redirecting_stream.isAlive()) redirecting_stream.stop();
                        //System.err.println("finished streaming");
                }
                catch (SocketException se)
                {
                        // don't do anything, the person disconnected, no error, (or mediaplayer sampled first 32
bytes.)
                }
                catch (FileNotFoundException fe)
                {
                        System.err.println("readFileToOutputStream could not find file " + the_file + " for
reading:" + fe.getMessage());
                }
                catch (Exception e)
                {
                        e.printStackTrace();
                }
        }
        private int getContext(HttpServletRequest request)
        {
                try
                {
```

```
                        String pragma = request.getHeader("pragma");
//                      Util.debug("pragma is " + pragma);
                        if (pragma == null)
                                return 0;
                        int index = pragma.indexOf(REQUEST_CONTEXT);
//                      Util.debug("index is " + index);
                        if (index < 0)
                        {
                                return 0;
                        }
                        else
                        {
                                int start = index + REQUEST_CONTEXT.length();
                                String contextNum = pragma.substring(start, start + 1);
//                              Util.debug("contextNum is " + contextNum);
                                return Integer.parseInt(contextNum);
                        }
// when I can read multiple headers with the same name I should use the below code
//                      int location=pragma.indexOf(CONTEXT_TAG);
//                      location=location+CONTEXT_TAG.length();
//                      int last_location;
//                      for (last_location=location; last_location<pragma.length() &&
pragma.charAt(last_location)!=','; last_location++);
//                      return(Integer.parseInt(pragma.substring(location, last_location)));
                }
                catch (Exception e)
                {
                        Util.debug("Exception caught in getContext: " + e.toString());
                        return 0;
                }
        }
*/
}
```

MediaList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class MediaList
{
	private Vector media = new Vector(0, 1);

	public void add(short mediaType, int mediaID, String filepath)
	{
		media.addElement(new Media(mediaID, mediaType, filepath));
	}

	public boolean inType(short mediaType)
	{

		Media test;

		for (int i = 0; i < media.size(); i++)
		{

			test = (Media) media.elementAt(i);

			if (test.mediaType == mediaType)
				return true;
		}

		return false;
	}

	public int getID(short mediaType)
	{
		for (int i = 0; i < media.size(); i++)
		{
			Media aMedia = (Media) media.elementAt(i);

			if (aMedia.mediaType == mediaType)
				return aMedia.mediaID;
		}

		return 0;
	}

	public String getFilepath(short mediaType)
	{
		for (int i = 0; i < media.size(); i++)
		{
			Media aMedia = (Media) media.elementAt(i);

			if (aMedia.mediaType == mediaType)
				return aMedia.filepath;
		}

		return null;
	}

	public int size()
	{
		return media.size();
	}
```

```
60
        public Media typeAt(int index)
        {
                return (Media) media.elementAt(index);
        }
65
        public String toString()
        {
                String result = "";

70              if (media == null)
                        return "(none)";

                for (int i = 0; i < media.size(); i++)
                {
75                      result = result.concat(media.elementAt(i).toString() + ",");
                }
                return "(" + result + ")";
        }

80  }
```

PickCount

```
package com.launch.PlaylistGenerator;
import javax.servlet.ServletOutputStream;
/**
 */
public class PickCount
{
	int explicit;
	int implicit;
	int unrated;
	String method = "";
	public PickCount(int userID, int djID, int ratio, int playlistSize, Population songs, ServletOutputStream out)
	{
		float explicitSize = songs.explicit.size();
		float implicitSize = songs.implicit.size();
		float unratedSize  = songs.unrated.size();
		Util.out(out, "Available: explicit songs: " + explicitSize + ", implicit songs: " + implicitSize + ", unrated songs: " + unratedSize);
		Util.out(out, "Ratio: " + ratio);
		// if you're listening to someone else's station, try to not listen to any unrated songs
		if (userID == djID)
		{
			// let's try to use their ratio
			double totalRated = (explicitSize + implicitSize);
			if (totalRated < Constants.MIN_RATINGS_TO_HONOR_RATIO)
			{
				method = "New User Unrated Ratio";
				ratio = Constants.NEW_USER_UNRATED_RATIO;
			}
			int maxPlicit = (int) Math.round(playlistSize * (100 - ratio) * 0.01);
			int maxRatedToPick = (int) Math.round(explicitSize * Constants.MAX_PERCENT_RATED_SONGS_TO_PICK * 0.01);
			// pick three times as much from rated
			int explicitToPick = (int) Math.round(playlistSize * (100 - ratio) * 0.01 * (explicitSize / totalRated) * 3);
			int implicitToPick = maxPlicit - explicitToPick;
			explicit    = (int) Math.min(maxRatedToPick, explicitToPick);
			implicit    = (int) Math.min(implicitSize, implicitToPick);
			// pick up the slack in unrated
			unrated = (playlistSize - explicit - implicit);
			method = "Unrated Ratio";
		}
		// if you're listening to someone else's station and they have enough ratings,
		// don't play unrated
		else if ((explicitSize + implicitSize) > Constants.MIN_SIZE_FOR_NO_UNRATED)
		{
			explicit = (int) Math.round(playlistSize * 0.50);
			explicit = (int) Math.round(Math.min(explicit, (explicitSize * Constants.MAX_PERCENT_RATED_SONGS_TO_PICK) * 0.01));
			implicit = (int) Math.min(playlistSize, implicitSize) - explicit;
			method = "DJ play - no unrated";
			// if we didn't get enough, use the default method
			if (explicit + implicit < playlistSize)
			{
				explicit = (int) Math.round(playlistSize * 0.33);
				explicit = (int) Math.round(Math.min(explicit, (explicitSize * Constants.MAX_PERCENT_RATED_SONGS_TO_PICK) / 100.0));
				implicit = (int) Math.round(playlistSize * 0.33);
```

```
60                                      implicit = (int) Math.round(Math.min(implicit, (implicitSize *
    Constants.MAX_PERCENT_RATED_SONGS_TO_PICK) / 100.0));
                                        unrated = playlistSize - explicit - implicit;
                                        method = "DJ play - not enough rated";
                                }
65                      }
                        // if neither of these worked
                        else
                        {
                                explicit = (int) Math.round(playlistSize * 0.33);
70                              explicit = (int) Math.round(Math.min(explicit, (explicitSize *
    Constants.MAX_PERCENT_RATED_SONGS_TO_PICK) / 100.0));
                                implicit = (int) Math.round(playlistSize * 0.33);
                                implicit = (int) Math.round(Math.min(implicit, (implicitSize *
    Constants.MAX_PERCENT_RATED_SONGS_TO_PICK) / 100.0));
75                              unrated = playlistSize - explicit - implicit;
                                method = "Default 33/33/33 method";
                        }
                        Util.out(out, "Picking: explicit songs: "
                                                + explicit
80                                              + ", implicit songs: "
                                                + implicit
                                                + ", unrated songs: "
                                                + unrated
                                                + ", method = " + method
85                                      );
                }
                public String toString()
                {
                        return "explicit to pick: "
90                                      + explicit
                                        + ", implicit to pick: "
                                        + implicit
                                        + ", unrated to pick: "
                                        + unrated;
95              }
                public void reset()
                {
                        explicit = 0;
                        implicit = 0;
100                     unrated  = 0;
                }
    }
    PickCount.java  Page 3 of 3     11/05/99 1:24 PM
```

PickList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class PickList extends Vector
{
        public PickList(PickCount counts)
        {
                // make a list of all the song types that we need to pick
                for (int i = 0; i < counts.explicit; i++)
                        addElement(Song.EXPLICIT);
                for (int i = 0; i < counts.implicit; i++)
                        addElement(Song.IMPLICIT);
                for (int i = 0; i < counts.unrated; i++)
                        addElement(Song.UNRATED);
        }
        public void addElement(short value)
        {
                addElement(new Short(value));
        }
        public void reAdd (short type, Vector songGroup, Population songs)
        {
                // try to pick from the same bucket again
                if (songGroup.size() > 0)
                        addElement(type);
                // otherwise, try the other ones
                else if (songs.explicit.size() > 0)
                        addElement(Song.EXPLICIT);
                else if (songs.implicit.size() > 0)
                        addElement(Song.IMPLICIT);
                else if (songs.unrated.size() > 0)
                        addElement(Song.UNRATED);
        }
        public short getRandom()
        {
                if (size() < 0)
                        return 0;
                int lucky = (int) Util.random(size() - 1);
                // figure out what group to pick from
                short type = ((Short) elementAt(lucky)).shortValue();
                removeElementAt(lucky);
                return type;
        }
}
```

PickStatus

```
package com.launch.PlaylistGenerator;
public class PickStatus
{
    public final static int NOT_PICKED = 0;
    public final static int REJECTED = 2;
    public final static int PICKED = 1;

    int status;
    int order = -1;
    short percentile;

    public String toString()
    {
        return toDisplayString(Util.DISPLAY_TEXT);
    }

    public String toDisplayString(int displayType)
    {
        String redStart = "";
        String greenStart = "";
        String fontEnd = "";

        if (displayType == Util.DISPLAY_HTML)
        {

            redStart = "<FONT COLOR=red><B>";
            greenStart = "<FONT COLOR=green><B>";
            fontEnd  = "</B></FONT>";
        }

        switch (status) {
            case NOT_PICKED:
                return "N  ";
            case PICKED:
                return greenStart + " P " + fontEnd;
            case REJECTED:
                return redStart + "  R" + fontEnd;
            default:
                return "   ";
        }
    }
}
```

PlayDataHash

```
package com.launch.PlaylistGenerator;
import java.util.Enumeration;
public class PlayDataHash extends IntHash
{
	public String toString()
	{
		String myString = "";


		for (Enumeration e = keys(); e.hasMoreElements() ;) {
			// debug.write("interation " + i++);
			int stationID = ((Integer) e.nextElement()).intValue();
			int rank = get(stationID);
			myString = myString.concat(
					"stationID: " +
					stationID +
					"=" +
					rank +
					"\n");
		}

		return myString;
	}
}
```

PlayDates

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
import java.util.Date;
import java.util.Enumeration;
import java.text.SimpleDateFormat;
import java.io.InputStreamReader;
import java.text.ParsePosition;
import java.io.IOException;
import java.util.Calendar;
public class PlayDates
{

        private static final String dateFormat = "yyyy-MM-dd HH:mm:ss";

        private Hashtable hash;
        int userID;

        double secondsInDay = Util.MILLISECONDS_IN_SECOND *
                                                Util.SECONDS_IN_MINUTE *
                                                Util.MINUTES_IN_HOUR *
                                                Util.HOURS_IN_DAY;
        // for date parsing
        private static StringBuffer year   = new StringBuffer("1234");
        private static StringBuffer month  = new StringBuffer("12");
        private static StringBuffer day    = new StringBuffer("12");

        private static StringBuffer hour   = new StringBuffer("12");
        private static StringBuffer minutes = new StringBuffer("12");
        public Date dbDate = new Date();

        private boolean loaded = false;

        public PlayDates()
        {
                hash = new Hashtable();
        }

        public void put(int songID, Date lastPlayed)
        {

                // the common case is that they will have NOT played this song before,
                // so create the Integer object in anticipation that we will use it for
                // the put as well.

                Integer i = new Integer(songID);

                Date before = get(i);

                // save only the most recent play of a song

                if (before == null || before.getTime() < lastPlayed.getTime())
                {
                        hash.put(i, lastPlayed);
                }
        }

        public Date get(int songID)
        {
```

```
60                  return (Date) hash.get(new Integer(songID));
            }

            public Date get(Integer songID)
            {
65                  return (Date) hash.get(songID);
            }

            public Enumeration keys()
            {
70                  return hash.keys();
            }

            public void remove(Integer songID)
            {
75                  hash.remove(songID);
            }

            public int size()
            {
80                  return hash.size();
            }

            public String toString()
            {
85
                    String result = "";

                    for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {
                            Integer songID = (Integer) e.nextElement();
90                          Date playedAt = get(songID);
                            result = result.concat("{" + songID + " = " + playedAt + "} ");
                    }

                    return result;
95          }

            public String toDBString()
            {
                    Date startDate = new Date();
100
                    StringBuffer buffer = new StringBuffer(100000);

                    Calendar cal = Calendar.getInstance();

105                 Integer songID;
                    Date playedAt;

                    for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {
                            songID = (Integer) e.nextElement();
110                         playedAt = get(songID);

    //                      System.out.println(playedAt);

                            cal.setTime(playedAt);
115
                            buffer.append(cal.get(Calendar.YEAR) + "-"
                                                    + leadingZero(cal.get(Calendar.MONTH) + 1) + "-"
                                                    + leadingZero(cal.get(Calendar.DAY_OF_MONTH)) + " "
                                                    + leadingZero(cal.get(Calendar.HOUR_OF_DAY)) + ":"
120                                                 + leadingZero(cal.get(Calendar.MINUTE)) + ":00=" +
```

```
songID + ",");

        //              result = result.concat(formatter.format(playedAt) + "=" + songID + ",");
                }

                Util.printElapsedTime("toDBString", startDate);

                return buffer.toString();
        }

        public static final String leadingZero (int value)
        {
                if (value < 10)
                        return "0" + value;

                return value + "";
        }

        public float getScore(Integer songID)
        {
                Date lastPlayed = get(songID);

                if (lastPlayed == null)
                        return 0;

                double secondsSincePlayed = new Date().getTime() - lastPlayed.getTime();
                double daysSincePlayed = secondsSincePlayed / secondsInDay;
                double logValue = Math.log(daysSincePlayed + 0.01);
                return (float) Math.min(100, (22.0 * logValue));
        }
        public void save(DBConnection conn)
        {
//              Date dateStarted = new Date();

                if (!loaded)
                        return;

                try
                {
                        conn.executeUpdate("exec sp_lcSavePlayHistoryText_isux " + userID + ", '" +
toDBString() + "'", false);
                }
                catch (DBException e)
                {
                        System.err.println("DBException in PlayDates:save: " + e.toString());
                }

//              Util.printElapsedTime("save", dateStarted);
        }

        public void markRecentlyPlayed(SongInfoCache cache, Population songs)
        {

                double now = dbDate.getTime();
                double lastThreeHours = Util.MILLISECONDS_IN_SECOND *
                                                        Util.SECONDS_IN_MINUTE *
                                                        Util.MINUTES_IN_HOUR *
                                                        3;
                Integer songID;
                Date playedAt;
                SongInfo info;
```

```
                int artistID, albumID;
                for (Enumeration e = hash.keys(); e.hasMoreElements() ;)
                {
185                     songID = (Integer) e.nextElement();
                        playedAt = get(songID);

                        if (now - playedAt.getTime() < lastThreeHours)
                        {
190                             // mark songs played in the last three hours
                                // so as to comply with the RIAA rules
                                // and make sure we don't pick too many later
                                info = (SongInfo) cache.get(songID, SongInfoCache.TYPE_SONG);

195                             if (info != null)
                                {
                                        artistID = info.getArtistID();
                                        albumID  = info.getAlbumID();

200                                     // "various artists" albums don't count
                                        if (!ArtistInfo.isVariousArtists(artistID))
                                        {
                                                songs.artistCounts.increment(artistID);
                                        }
205                                     songs.albumCounts.increment(albumID);
                                }
                        }
                }
        }
210
        public void oldLoad(DBConnection conn, int userID)
        {

                this.userID = userID;
215
                try
                {
                        String sql = "exec sp_IcoGetLastPlayed_xsxx " + userID;
                        DBResultSet rs   = conn.executeSQL(sql);
220
                        loaded = true;

                        Date lastDate;
                        int songID;
225                     while (!rs.getBOF() && !rs.getEOF())
                        {

                                songID   = rs.getInt("songID");
                                lastDate = rs.getTimestamp("lastPlayed");
230
                                put(songID, lastDate);

                                rs.next();
                        }
235
                }
                catch (DBException e)
                {
                        System.err.println("DBException in PlayDates.oldLoad: " + e.toString());
240             }

        }
```

```
        public void load(DBConnection conn, int userID)
245     {

                Date startDate = new Date();

                // be careful of the SQL Server TEXTSIZE parameter which is by default 64KB
250
                this.userID = userID;

                double aDay = Util.MILLISECONDS_IN_SECOND *
                                                Util.SECONDS_IN_MINUTE *
255                                             Util.MINUTES_IN_HOUR *
                                                Util.HOURS_IN_DAY;

                double aMonth = aDay * Util.DAYS_IN_MONTH;

260             try
                {

                        String sql = "exec sp_lcGetSongHistoryText_xsxx " + userID;

265                     DBResultSet rs    = conn.executeSQL(sql);
                        Util.printElapsedTime("LP: ran getsonghistorytext", startDate);

                        if (!rs.getBOF() && !rs.getEOF())
                        {
270                             loaded = true;
                                char[] stuff = new char[100000];

                                InputStreamReader reader = new
    InputStreamReader(rs.getAsciiStream("played"));
275
                                Util.printElapsedTime("LP: created reader", startDate);
                                dbDate = rs.getTimestamp("dbDate");
                                long dbDateTime = dbDate.getTime();

280                             reader.read(stuff);
                                Util.printElapsedTime("LP: read into stuff", startDate);
                                Calendar cal = Calendar.getInstance();
                                int lastStart = 0;
                                int songID = 0;
285 //                            SimpleDateFormat formatter1 = new
    SimpleDateFormat(PlayDates.dateFormat);
    //                          ParsePosition pos = new ParsePosition(0);

                                Date datePlayed = null;
290                             String parseme = new String();

                                long length = stuff.length;

                                for (int i = 0; i < length; i++)
295                             {

                                        switch (stuff[i])
                                        {
                                        case '=':
300 //                                          parseme = new String(stuff, lastStart, i - lastStart);
    //                                      pos.setIndex(0);
    //                                      datePlayed = formatter1.parse(parseme, pos);
```

```
                                                datePlayed = parseDate(stuff, lastStart, cal);
305     //                                      System.out.println("date is " + datePlayed);
        //                                      if (datePlayed == null)
        //                                      {
        //                                              pos.setIndex(0);
        //                                              datePlayed = formatter2.parse(parseme, pos);
310     //                                      }
                                                lastStart = i + 1;
                                                break;

                                        case ',':
315                                             parseme = new String(stuff, lastStart, i - lastStart);

                                                try
                                                {
                                                        songID = Integer.parseInt(parseme);
320                                             }
                                                catch (NumberFormatException e) { }

                                                // save 'em
                                                // also don't save them if they're > 30 days old
325                                             if (songID > 0 && datePlayed != null && ((dbDateTime -
    datePlayed.getTime()) < aMonth))
                                                {
                                                        put(songID, datePlayed);
                                                }
330                                             songID = 0; // reset
                                                datePlayed = null; // reset

                                                lastStart = i + 1;
                                                break;
335
                                        case 0:
                                                // we're at the end of the string
        //                                      Util.printElapsedTime("LP: found null at char " + i,
    startDate);
340                                             return;
                                        }
                                }
                        }
                        catch (DBException oops)
345                     {
                                Util.debug("DBException in PlayDates.load: " + oops.getMessage());
                        }
                        catch (IOException oops)
350                     {
                                Util.debug("IOException in PlayDates.load: " + oops.getMessage());
                        }
                }
                /**
355              * Why? Because SimpleDateFormat is *way* too slow.
                 */
                private final Date parseDate(char[] chars, int start, Calendar cal)
                {
                        // 1999-10-13 17:19:00
360                     // 0123456789012345678
                        /*
                        String year, month, day, hour, minutes;
                        year   = new String(chars, start, 4);
                        month  = new String(chars, start + 5, 2);
```

```
365                     day     = new String(chars, start + 8, 2);

                        hour    = new String(chars, start + 11, 2);
                        minutes = new String(chars, start + 14, 2);
                        */
370
                        year.setCharAt(0, chars[start + 0]);
                        year.setCharAt(1, chars[start + 1]);
                        year.setCharAt(2, chars[start + 2]);
                        year.setCharAt(3, chars[start + 3]);
375
                        month.setCharAt(0, chars[start + 5]);
                        month.setCharAt(1, chars[start + 6]);

                        day.setCharAt(0, chars[start + 8]);
380                     day.setCharAt(1, chars[start + 9]);

                        hour.setCharAt(0, chars[start + 11]);
                        hour.setCharAt(1, chars[start + 12]);

385                     minutes.setCharAt(0, chars[start + 14]);
                        minutes.setCharAt(1, chars[start + 15]);

                        int yearInt = 0, monthInt = 0, dayInt = 0, hourInt = 0, minutesInt = 0;
    //                  try
390 //                  {
                                yearInt   = parseInt(year);
                                monthInt  = parseInt(month);
                                dayInt    = parseInt(day);

395                             hourInt   = parseInt(hour);
                                minutesInt = parseInt(minutes);
    //                  }
    //                  catch (NumberFormatException e) { return null;}

400 //                  cal.clear();
                        cal.set(yearInt, monthInt - 1, dayInt, hourInt, minutesInt, 0);
                        return cal.getTime();
                }

405
                private static final int parseInt(StringBuffer s)
                {
                        int result = 0;
                        int last = s.length() - 1;
410
                        for (int i = last; i >= 0; i--)
                        {
                                result += char2int(s.charAt(i)) * Math.pow(10, last - i);
                        }
415
                        return result;
                }

                private final static int char2int(char ch)
420             {
                        switch (ch)
                        {
                                case '1':
                                        return 1;
425                             case '2':
```

```
                                return 2;
                        case '3':
                                return 3;
                        case '4':
                                return 4;
                        case '5':
                                return 5;
                        case '6':
                                return 6;
                        case '7':
                                return 7;
                        case '8':
                                return 8;
                        case '9':
                                return 9;
                        default:
                                return 0;
                }
        }
}
```

Playlist

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.util.Hashtable;
import java.util.Enumeration;
import java.util.Date;
public class Playlist
{
	Vector media;
	Vector news;
	Vector ads;
	Vector tips;
	int ID;
	int userID;
	int djID;
	int moodID;
	short mediaType;
	boolean debug;
	boolean popularOnly = false;
	PickCount counts;
	public final static int BUCKET_COUNT = 5;
	private int lastIndex;
	int buckets[];
	IntHash artists;
	IntHash albums;
	public Playlist()
	{
		artists = new IntHash();
		albums  = new IntHash();
		counts  = null;
		media   = new Vector();
		news    = new Vector();
		ads     = new Vector();
		tips    = new Vector();
		buckets = new int[BUCKET_COUNT];
		lastIndex = -1;
		debug = false;
	}
	public Playlist(int playlistID)
	{
		this();
		ID = playlistID;
	}
	public void resetSources()
	{
		for (int i = 0; i < BUCKET_COUNT; i++)
			buckets[i] = 0;
	}
	private void saveOrigins(DBConnection conn)
	{
		String listString = "";
		SongData data;
		for (int i = 0; i < media.size(); i++)
		{
			listString = listString.concat(((SongData) media.elementAt(i)).originTclList());
		}
		try
		{
			conn.executeSQL("exec sp_lcSaveOrigins_ixxd " + userID + ", '" + listString + "'");
```

```
60                      }
                        catch (DBException oops)
                        {
                                Util.debug("DB Exception: " + oops.getMessage());
                        }
65              }
                public Playlist2 toPlaylist2()
                {
                        Playlist2 result = new Playlist2();
                        // copy playlist
70                      for (int i = 0; i < media.size(); i++)
                        {
                                result.songs.addElement(((SongData)
    media.elementAt(i)).toPlaylistEntry(mediaType));
                        }
75                      // copy news
                        for (int i = 0; i < news.size(); i++)
                        {
                                result.news.addElement(((Clip) news.elementAt(i)).toPlaylistEntry(mediaType));
                        }
80                      // copy ads
                        for (int i = 0; i < ads.size(); i++)
                        {
                                result.ads.addElement(((Clip) ads.elementAt(i)).toPlaylistEntry(mediaType));
                        }
85                      // copy tips
                        for (int i = 0; i < tips.size(); i++)
                        {
                                result.tips.addElement(((Clip) tips.elementAt(i)).toPlaylistEntry(mediaType));
                        }
90                      return result;
                }
                public String toString()
                {
                        IntHash artistCount       = new IntHash();
95                      IntHash albumCount        = new IntHash();
                        IntHash querySource       = new IntHash();
                        Hashtable querySourceName  = new Hashtable();
                        IntHash originSource      = new IntHash();
                        Hashtable originSourceName = new Hashtable();
100                     Hashtable artistNames     = new Hashtable();
                        Hashtable albumNames      = new Hashtable();
                        String result = "Playlist " + ID + " for userID " + userID
                                                        + " (djID " + djID + ") in mood " + moodID
                                                        + " with mediaType " + mediaType
105                                                     + ", pickCounts: " + counts
                                                        + " has " + media.size() + " songs:"
                                                        + Util.newLine;
                        for (int i = 0; i < media.size(); i++)
                        {
110                             SongData data = (SongData) media.elementAt(i);
                                String songStr = data.getMediaID(mediaType) + " "
                                        + data.getAlbumID() + " "
                                        + data.getArtistID() + " "
                                        + data.songID + " "
115                                     + data.getArtistName() + " "
                                        + data.getAlbumName() + " "
                                        + data.getSongName() + Util.newLine;
                                querySource.increment(data.querySource);
                                querySourceName.put(new Integer(data.querySource),
120     data.sourceString(data.querySource));
```

```
                byte origin = data.origin();
                originSource.increment(origin);
                originSourceName.put(new Integer(origin), data.sourceString(origin));
                artistCount.increment(data.getArtistID());
                albumCount.increment(data.getAlbumID());
                if (data.getArtistName() != null)
                        artistNames.put(new Integer(data.getArtistID()), data.getArtistName());
                if (data.getAlbumName() != null)
                        albumNames.put(new Integer(data.getAlbumID()), data.getAlbumName());
                result = result.concat(songStr);
        }
        result = result.concat(Util.newLine);
        for (Enumeration e = artistCount.keys(); e.hasMoreElements() ;) {
                int artistID = ((Integer) e.nextElement()).intValue();
                String artistStr = artistCount.get(artistID)
                                                        + " songs are by the artist "
                                                        + artistNames.get(new Integer(artistID))
                                                        + " (" + artistID + ") "
                                                + Util.newLine;
                result = result.concat(artistStr);
        }
        result = result.concat(Util.newLine);
        for (Enumeration e = albumCount.keys(); e.hasMoreElements() ;) {
                int albumID = ((Integer) e.nextElement()).intValue();
                String albumStr = albumCount.get(albumID)
                                                        + " songs are from the album "
                                                        + albumNames.get(new Integer(albumID))
                                                        + " (" + albumID + ") "
                                                + Util.newLine;
                result = result.concat(albumStr);
        }
        result = result.concat(Util.newLine);
        for (Enumeration e = querySource.keys(); e.hasMoreElements() ;) {
                int source = ((Integer) e.nextElement()).intValue();
                int songCount = querySource.get(source);
                double doubleCount = new Double(songCount).doubleValue();
                String str = songCount
                                                        + " songs ("
                                                        + ((doubleCount / length()) * 100)
                                                        + "%) are from the "
                                                        + querySourceName.get(new
Integer(source))
                                                        + " query"
                                                + Util.newLine;
                result = result.concat(str);
        }
        result = result.concat(Util.newLine);
        for (Enumeration e = originSource.keys(); e.hasMoreElements() ;) {
                int source = ((Integer) e.nextElement()).intValue();
                int songCount = originSource.get(source);
                double doubleCount = new Double(songCount).doubleValue();
                String str = songCount
                                                        + " songs ("
                                                        + ((doubleCount / length()) * 100)
                                                        + "%) originated from "
                                                        + originSourceName.get(new
Integer(source))
                                                + Util.newLine;
                result = result.concat(str);
        }
        result = result.concat(Util.newLine);
```

```
                int bucketSize = 100 / BUCKET_COUNT;
                double playlistLength = media.size();
                for (int i = 0; i < BUCKET_COUNT; i++)
185             {
                        result = result.concat(
                                                "Percentile "
                                                + (i * bucketSize) + "% - "
                                                + ((i + 1) * bucketSize) + "%: " + buckets[i] + " ("
190                                             + Util.fix(100 * (buckets[i] / playlistLength), 2, 0) + "%)" +
Util.newLine);
                }
                return (result + Util.newLine);
        }
195     public int length ()
        {
                return media.size();
        }
        public void append (SongData song)
200     {
                float bucketSize = (new Float(101)).floatValue() / (new Float(BUCKET_COUNT)).floatValue();
                int bucket = (int) Math.floor(song.status.percentile / bucketSize);
//              Util.debug("adding mediaID " + song.mediaID
//                              + " in percentile " + song.status.percentile + " (bucket "
205 //                           + bucket + ")");
                media.addElement(song);
                buckets[bucket]++;
        }
        public Playlist shuffle()
210     {
                Vector newList = new Vector(media.size());
                int rand = 0;
                while (media.size() > 0)
                {
215                     rand = (int) Util.random(media.size() - 1);
                        Object m = media.elementAt(rand);
                        media.removeElementAt(rand);
                        newList.addElement(m);
                }
220             media = newList;
                return this;
        }
        public int nextOrdinal(DBConnection conn)
        {
225             int ordinal = 1;
                try
                {
                        DBResultSet rs = conn.executeSQL("exec sp_lcGetOrdinalID_xsxx " + userID);
                        while (!rs.getBOF() && !rs.getEOF())
230                     {
                                ordinal = rs.getInt("ordinal");
                                rs.next();
                        }
                        conn.executeSQL("exec sp_lcUpdatePlaylistData_ixxd "
235                                                             + userID + ", "
                                                                + djID + ", "
                                                                + moodID + ", "
                                                                + mediaType);
                }
240             catch (DBException oops)
                {
                        Util.debug("DB Exception in Playlist::nextOrdinal: " + oops.getMessage());
```

```
            }
            return ordinal;
245     }
        public void deleteHighOrdinals(DBConnection conn, int ordinal)
        {
            try
            {
250             conn.executeSQL("exec sp_lcDeletePlaylistRange_xxxd "
                                                    + userID + ", "
                                                    + ordinal);
            }
            catch (DBException oops)
255         {
                Util.debug("DB Exception in Playlist::deleteHighOrdinals: " + oops.getMessage());
            }
        }
        private SimplePlaylist toSimplePlaylist()
260     {
            SimplePlaylist result = new SimplePlaylist();
            result.mediaType = this.mediaType;
            result.djID      = this.djID;
            result.moodID    = this.moodID;
265
            // copy playlist
            for (int i = 0; i < media.size(); i++)
            {
                result.songs.addElement(((SongData) media.elementAt(i)).toSimpleClip(mediaType));
270         }
            // copy news
            for (int i = 0; i < news.size(); i++)
            {
                result.news.addElement(((Clip) news.elementAt(i)).toSimpleClip(mediaType));
275         }
            // copy ads
            for (int i = 0; i < ads.size(); i++)
            {
                result.ads.addElement(((Clip) ads.elementAt(i)).toSimpleClip(mediaType));
280         }
            // copy tips
            for (int i = 0; i < tips.size(); i++)
            {
                result.tips.addElement(((Clip) tips.elementAt(i)).toSimpleClip(mediaType));
285         }
            return result;
        }

        public void save (DBConnection conn, SimplePlaylist oldPlaylist)
290     {
            Date startDate = new Date();

            SimplePlaylist thoreau = toSimplePlaylist();

295         Util.printElapsedTime("Convert to SimplePlaylist", startDate);

            if (oldPlaylist != null)
            {
                thoreau.lastAd   = oldPlaylist.lastAd;
300             thoreau.lastNews = oldPlaylist.lastNews;
                thoreau.lastTip  = oldPlaylist.lastTip;
            }
```

```
                thoreau.save(conn, userID);

                Util.printElapsedTime("SavePlaylist", startDate);
        }

        /*
        public boolean save (DBConnection conn)
        {
                if (length() <= 0)
                        return false;
                boolean resetOrdinal = false;
                int highOrdinal, ordinal;
                Date startDate = new Date();
                highOrdinal = ordinal = nextOrdinal(conn);
                if (highOrdinal > MAX_ORDINAL)
                {
                        ordinal = 1;
                        resetOrdinal = true;
                }
                Util.printElapsedTime("GetOrdinal", startDate);
                Thread saveNews = new SaveClips(news, "sp_lcSaveNewsPlaylist_ixxd", ordinal, mediaType,
userID);
                Thread saveAds  = new SaveClips(ads, "sp_lcSaveAdsPlaylist_ixxd", ordinal, mediaType,
userID);
                Thread saveTips = new SaveClips(tips, "sp_lcSaveTipsPlaylist_ixxd", ordinal, mediaType,
userID);
                int partition = (int) Math.round(media.size() / 4.0);
                Thread savePlaylist1 = new SavePlaylist(this, 0, partition, ordinal);
                Thread savePlaylist2 = new SavePlaylist(this, partition, partition * 2, ordinal + partition);
                Thread savePlaylist3 = new SavePlaylist(this, partition * 2, partition * 3, ordinal + (partition *
2));
                Thread savePlaylist4 = new SavePlaylist(this, partition * 3, media.size(), ordinal + (partition *
3));
                savePlaylist1.start();
                savePlaylist2.start();
                savePlaylist3.start();
                savePlaylist4.start();
                saveNews.start();
                saveAds.start();
                saveTips.start();
                deleteHighOrdinals(conn, highOrdinal - 1);
                // everybody done yet?
                saveOrigins(conn);
                try
                {
                        saveNews.join();
                        saveAds.join();
                        saveTips.join();
                        savePlaylist1.join();
                        savePlaylist2.join();
                        savePlaylist3.join();
                        savePlaylist4.join();
                }
                catch (InterruptedException e)
                {
                        Util.debug("Playlist::save was interrupted while waiting");
                }
                Util.printElapsedTime("SavePlaylist", startDate);
                return true;
        }
        */
```

```
365
        private void saveClips(DBConnection conn, Vector clips, String storedProc)
        {
                for (int i = 0; i < clips.size(); i++)
                {
370                     Clip aClip = (Clip) clips.elementAt(i);
                        String sql = "exec " + storedProc + " "
                                + ID + ", "
                                + aClip.mediaID + ", "
                                + mediaType + ", "
375                             + userID;
                        try
                        {
                                DBResultSet rs = conn.executeSQL(sql);
                        }
380                     catch (DBException oops)
                        {
                                Util.debug("DB Exception: " + oops.getMessage());
                        }
                }
385     }
        public String newLine()
        {
                return Util.newLine;
        }
390     public String toASX()
        {
                String asx = "<ASX VERSION=\"3.0\" PREVIEWMODE=\"NO\">" + Util.newLine
                        + Util.tab() + "<REPEAT>" + Util.newLine;
                String streamURL = Constants.STREAM_URL + "?u="
395                     + userID;
                for (int i = 0; i < 10; i++)
                {
                        asx = asx.concat(Util.tab(2) +
                                                        "<ENTRY>" + Util.newLine
400                                                     + Util.tab(3)
                                                        + "<REF HREF=\""
                                                        + streamURL
                                                        + "&n="
                                                        + i
405                                                     + ".asp"
                                                        + "\"/>" + Util.newLine
                                                        + Util.tab(2)
                                                        + "</ENTRY>" + Util.newLine);
                }
410             asx = asx.concat(Util.tab() + "</REPEAT>" +Util.newLine
                                                        + "</ASX>" + Util.newLine);
                return asx;
        }
}
415 Playlist.java       Page 10 of 10       11/05/99 1:38 PM
```

Playlist2

```
package com.launch.PlaylistGenerator;
import java.util.*;
//---------------------------------------------------------------------
/**
* @author Ted Leung
* @version 1999-09-22
**/
//---------------------------------------------------------------------
public final class Playlist2 implements java.io.Serializable
{
	//*************************************************************************
	// variables
	//*************************************************************************
		/** all these vectors contain exclusively Strings which are directory/filename of audio files */
		public Vector songs;
		public Vector news;
		public Vector ads;
		public Vector tips;

	//*************************************************************************
	// methods
	//*************************************************************************

		public Playlist2()
		{
			songs = new Vector(50);
			news  = new Vector(10);
			ads   = new Vector(10);
			tips  = new Vector(10);
		}

	//---------------------------------------------------------------------
	/**
	**/
	//---------------------------------------------------------------------
		public final String toString()
		{
			return
			(
				"songs="+songs.toString() + ", " +
				"news="+news.toString() + ", " +
				"ads="+ads.toString() + ", " +
				"tips="+tips.toString()
			);
		}
	//*************************************************************************
}
```

PlaylistCreatorTest

```
package com.launch.PlaylistGenerator;
public class PlaylistCreatorTest
{
    public static void main(String[] args)
    {

        Util.debug("using database server " + Constants.DB_SERVER);

        SongInfoCache songCache = new SongInfoCache(null);
        songCache.ratingsCache = new RatingsCache();
//      PlaylistParameters params = new PlaylistParameters(3771, null, 0, 13302);
        PlaylistParameters params = new PlaylistParameters(6474126, null, 0, 6474126);
        PlaylistGenerator gen    = new PlaylistGenerator(params, songCache, null);
        Playlist playlist        = gen.create(true, null);

        gen.toMatrix(null, Util.DISPLAY_TEXT);
        System.exit(0);
    }
}
```

PlaylistEntry

```
package com.launch.PlaylistGenerator;
import java.io.*;
public class PlaylistEntry implements Serializable
{

        public String title, filepath, songTitle, albumTitle, artistTitle;
        public int mediaID, songID, albumID, artistID;

        public short implicit;
        public byte origin;


}
```

PlaylistEntry.javaPage 1 of 1 11/05/99 1:28 PM

PlaylistGenerator

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.util.Date;
import javax.servlet.ServletOutputStream;
import java.util.Enumeration;
public class PlaylistGenerator
{
        public final static byte RATER_DJ    = 1;
        public final static byte RATER_BDS   = 2;
        public final static byte RATER_GENRE = 3;
        private short factor      = (short)Constants.DEFAULT_PICK_FACTOR;
        private short ratio       = (short) Constants.DEFAULT_UNRATED_RATIO;
        private int playlistSize  = Constants.DEFAULT_PLAYLIST_SIZE;
        private int playlistID;
        private boolean haveTitles = false;
        private Date startDate;
        private Date lastDate;
        private int userID;
        private int djID;
        private int moodID;
        private short mediaType;
        private IntHash ratings;
        private ItemsProfile items;
        private PlayDates lastPlayed;
        private Population songs;
        private Vector news;
        private Vector ads;
        private Vector tips;
        private DJList djs;
        private GenreList genres;
        private Bandwidth speed;
        private MediaFormat format;

        private StationList stations;
        private ServletOutputStream out;
        private SongInfoCache songCache;
        private boolean playExplicitLyrics = true;
        /**
         * Creates a new playlist generator.
         */
        public PlaylistGenerator()
        {
                songs     = new Population();
                news      = new Vector();
                ads       = new Vector();
                tips      = new Vector();
                ratings   = new IntHash();
                djs       = new DJList();
                items     = new ItemsProfile();
                lastPlayed = new PlayDates();
                genres    = new GenreList();
                stations  = new StationList();
        }
        public PlaylistGenerator (PlaylistParameters params, SongInfoCache cache, ServletOutputStream out)
        {
                this();
                userID      = params.userID;
                moodID      = params.moodID;
```

```
60                  djID        = params.djID;

                    if (djID <= 0) djID = userID;

                    speed       = params.speed;
65                  format              = params.format;
                    playlistSize = params.playlistSize;
                    songCache   = cache;
                    this.out    = out;
                }
70              private void getRandom()
                {
                    Date startDate = new Date();
                    Song ditty;
                    SongData data;
75                  SongInfo info;
                    SongList songList;
                    int rowCount = 0;
                    double pickCount;
                    double totalSongs;
80                  // the simple way
                    /*
                    songList = cache.getInGenres(genres);
                    pickCount = Math.min(songList.size(), this.RANDOM_SONGS_COUNT);
                    // import them all
85                  if (pickCount == songList.size())
                    {
                        for (int i = 0; i < pickCount; i++)
                        {
                            info = songList.elementAt(i);
90                          rowCount += addRandom(info, SongData.SOURCE_RANDOM);
                        }
                    }
                    // import a random subset
                    else
95                  {
                        for (int i = 0; i < pickCount; i++)
                        {
                            info = songList.pickRandom();
                            rowCount += addRandom(info, SongData.SOURCE_RANDOM);
100                     }
                    }
                    */
                    // the faster(?) but way more complicated way
                    int songCount  = songCache.countInGenres(genres);
105                 totalSongs          = songCache.size(SongInfoCache.TYPE_SONG);
                    double percent = (songCount / totalSongs) * 100.0;
                    Util.printElapsedTime("GetRandom done counting in genres", startDate);

                    // the problem is if we pick randomly and they want songs from
110                 // only a few genres, we're probably not going to get enough to create
                    // a playlist. So instead, if there's not a whole lot of songs in those genres,
                    // just get them directly from the genres instead of taking our chances with random
                    Util.debug("getRandom: " + songCount + " non-unique songs in genres (" + percent + "%)");
                    if (percent < Constants.MIN_SONGS_IN_GENRES_TO_GET_RANDOM)
115                 {
                        Util.debug("getRandom: getting directly from genres");
                        // get the list of songs from each genre
                        // choose the number to pick from each, proportional to the number of songs
                        // pick them
120                     int totalToPick = Math.min(Constants.RANDOM_SONGS_COUNT, songCount);
```

```
                        for (int i = 0; i < genres.size(); i++)
                        {
                                songList  = songCache.getInGenre(genres.genreAt(i));
                                pickCount = totalToPick * (songList.size() / ((double) songCount));
125                             for (int j = 0; j < pickCount; j++)
                                {
                                        info = songList.pickRandom();
                                        if (info != null)
                                        {
130                                             rowCount += addRandom(info,
SongData.SOURCE_GENRES);
                                        }
                                }
                        }
135             }
                else
                {
                        Util.debug("getRandom: picking randomly from all songs");
                        for (int i = 0; i < Constants.RANDOM_SONGS_COUNT; i++)
140                     {
                                // this is really fast
                                info = songCache.randomSong();
                                // this is really slow
                                rowCount += addRandom(info, SongData.SOURCE_RANDOM);
145                     }
                }
                Util.debug("getRandom added " + rowCount + " songs");
                Util.printElapsedTime("GetRandom done", startDate);
        }
150     private int addRandom(SongInfo info, byte source)
        {
                SongData data = songs.initSongGetData(info.songID, Song.UNRATED);
                if (data != null)
                {
155                     data.querySource = source;
                        data.setInfo(info);
                        return 1;
                }
                return 0;
160     }
        private void getPopular(SongList list)
        {
                Date startDate = new Date();
                Song ditty;
165             SongData data;
                SongInfo info;
                int rowCount = 0;
                if (list != null)
                {
170                     for (int i = 0; i < list.size(); i++)
                        {
                                info = list.elementAt(i);
                                data = songs.getSongData(info.songID);
                                if (data != null)
175                             {
                                        // we can't add it, but let's append the info while we're here
                                        data.setInfo(info);
                                }
                                else
180                             {
                                        data = songs.initSongGetData(info.songID, Song.UNRATED);
```

```
                                        if (data != null)
                                        {
                                                data.querySource = data.SOURCE_POPULAR;
185                                             data.setInfo(info);
                                        }
                                        rowCount++;
                                }
                        }
190             }
                Util.debug("getPopular added " + rowCount + " songs");
        }
        /**
         * Gets all the required media and data to generate a playlist.
195      */
        private void gatherMedia(DBConnection conn)
        {
                Thread getLastPlayed  = new GetLastPlayed(lastPlayed, userID, out);
                Util.out(out, "starting gathering threads at " + timeStamp());
200             // try to start them in ascending order of speed
                getLastPlayed.start();
                // get djs, genres, and bds subscriptions
                getSubscriptions(conn, djID, moodID);
                Util.out(out, "getSubscriptions done " + timeStamp());
205             // we need to wait for the djs to come in first
                Thread getRatings  = new GetRatings(songs, items, djID, djs, songCache, out);
                getRatings.start();
                Util.out(out, "All threads started " + timeStamp());
                // getpopular and getrandom should not be threads since they are purely processor bound now
210             getPopular(songCache.getPopular(mediaType));
                Util.out(out, "getPopular done " + timeStamp());
                getRandom();
                Util.out(out, "getRandom done (picked " + Constants.RANDOM_SONGS_COUNT + " songs)"
+ timeStamp());
215             Util.out(out, "genres for mood " + moodID + ":" + genres.toString());
                // wait for them to finish
                try
                {
                        getRatings.join();
220                     getLastPlayed.join();
                }
                catch (InterruptedException oops)
                {
                        Util.debug("InterruptedException: " + oops.toString());
225             }
                Util.out(out, "gatherMedia done " + timeStamp());
        }
        public void getSubscriptions(DBConnection conn, int userID, int moodID)
        {
230             Date started = new Date();
                try
                {
                        DBResultSet rs = conn.executeSQL("exec sp_IcoGetAllSubscriptions_xsxx "
                                                                                        + userID + ", "
235                                                                                     + moodID);
                        int raterID;
                        int raterType;
                        while (!rs.getBOF() && !rs.getEOF())
                        {
240                             raterID  = rs.getInt("raterID");
                                raterType = rs.getInt("raterType");
                                if (raterType == RATER_DJ)
```

```
                                {
                                        djs.addElement(new DJ(raterID));
                                }
                                else if (raterType == RATER_GENRE)
                                {
                                        genres.add((short) raterID);
                                }
                                else if (raterType == RATER_BDS)
                                {
                                        stations.addElement(new Station(raterID));
                                }

                                rs.next();
                        }
                        Util.debug("getSubscriptions added "
                                        + djs.size() + " DJs, "
                                        + genres.size() + " Genres, "
                                        + stations.size() + " Stations");
                }
                catch (DBException oops)
                {
                        Util.debug("DB Exception in getSubscriptions " + oops.getMessage());
                }
                Util.printElapsedTime("getSubscriptions took ", started);
        }
        /**
        Calculates scores for all the songs and puts them into the various vectors
        */
        public void processSongs()
        {
                byte result;
                WeightMatrix weights = new WeightMatrix();
                Integer songID;
                Song aSong;
                SongData data;
                short type;
                Date playedAt;
                SongInfo info;
                int good = 0;
                int tested = 0;
                int artistID, albumID;
                Item albumItem;
                Item artistItem;

                AlbumArtistData albumAndArtist = new AlbumArtistData();

                IntHash reasons = new IntHash();
                double now = lastPlayed.dbDate.getTime();
                double lastThreeHours = Util.MILLISECONDS_IN_SECOND *
                                                        Util.SECONDS_IN_MINUTE *
                                                        Util.MINUTES_IN_HOUR *
                                                        3;
                for (Enumeration e = songs.keys(); e.hasMoreElements() ;)
                {
                        tested++;

                        albumAndArtist.reset();

                        songID = (Integer) e.nextElement();
                        aSong  = songs.get(songID);
                        data   = aSong.getData();
```

```
305                         if (aSong.getType() == Song.EXCLUDED)
                            {
                                reasons.increment(1);
                            }
                            else
310                         {
                                // add the song info
                                info = data.getInfo();
                                // get the song info from the cache
                                if (info == null)
315                             {
                                    info = (SongInfo) songCache.get(songID,
    SongInfoCache.TYPE_SONG);
                                    data.setInfo(info);
                                }
320                             // if it's still null, it's not encoded
                                if (info == null)
                                {
                                    aSong.setType(Song.EXCLUDED);
                                    reasons.increment(2);
325                                 continue;
                                }
                                // ok, we have the song info.
                                // add last played
                                playedAt = lastPlayed.get(songID);
330                             if (playedAt != null)
                                {
                                    lastPlayed.remove(songID);

                                    // don't play the same song twice in a 3 hour period
335                                 if (now - playedAt.getTime() < lastThreeHours)
                                    {
                                        // mark songs played in the last three hours
                                        // so as to comply with the RIAA rules
                                        // and make sure we don't pick too many later
340                                     artistID = data.getArtistID();
                                        albumID  = data.getAlbumID();
                                        // "various artists" albums don't count
                                        if (!ArtistInfo.isVariousArtists(artistID))
                                        {
345                                         songs.artistCounts.increment(artistID);
                                        }
                                        songs.albumCounts.increment(albumID);
                                        // make sure we don't play this again so soon
                                        aSong.setType(Song.EXCLUDED);
350                                     reasons.increment(3);
                                        continue;
                                    }
                                    data.lastPlayed = lastPlayed.getScore(songID);
                                }
355                             // check for bad words
                                if (!playExplicitLyrics && info.hasExplicitLyrics())
                                {
                                    aSong.setType(Song.EXCLUDED);
                                    reasons.increment(4);
360                                 continue;
                                }
                                // now check for media in the type we need
                                if (!info.media.inType(mediaType))
                                {
```

```
365                                     aSong.setType(Song.EXCLUDED);
                                        reasons.increment(5);
                                        continue;
                                }
                                // check for valid genres
370                             if (!info.album.inGenres(genres))
                                {
                                        // for popular songs, don't exclude them,
                                        // otherwise we won't be able to default to them
                                        // if the genre restrictions are too tight
375                                     if (data.querySource == data.SOURCE_POPULAR)
                                        {
                                                songs.remove(songID);
                                        }
                                        reasons.increment(6);
380                                     aSong.setType(Song.EXCLUDED);
                                        continue;
                                }
                                // we got this far, so try to calculate an implicit rating
                                result = data.calculateImplicit(items, albumAndArtist);
385                             if (result == SongData.EXCLUDE_ME)
                                {
                                        aSong.setType(Song.EXCLUDED);
                                        reasons.increment(7);
                                        continue;
390                             }
                                if (result == SongData.MAKE_ME_IMPLICIT)
                                {
                                        aSong.setType(Song.IMPLICIT);
                                        data.calculateDJs(items, albumAndArtist);
395                                     data.score(weights, stations);
                                        songs.implicit.addElement(data);
                                        good++;
                                }
                                else
400                             {
                                        type = aSong.getType();
                                        // put the song in a list to pick from later
                                        if (type == Song.EXPLICIT)
                                        {
405                                             // your djs don't matter if you explicitly rated the song
                                                songs.explicit.addElement(data);
                                        }
                                        else if (type == Song.IMPLICIT)
                                        {
410                                             data.calculateDJs(items, albumAndArtist);
                                                songs.implicit.addElement(data);
                                        }
                                        else if (type == Song.UNRATED)
                                        {
415                                             data.calculateDJs(items, albumAndArtist);
                                                songs.unrated.addElement(data);
                                        }
                                        // calculate the score
                                        data.score(weights, stations);
420                                     good++;
                                }
                        }
                }

425             Util.out(out, "scores calculated " + timeStamp());
```

```
                // for all the songs we didn't get for whatever reason, make sure we
                // are accounting for their plays for compliance with RIAA rules
                lastPlayed.markRecentlyPlayed(songCache, songs);
                Util.out(out, "recently played albums and artists marked " + timeStamp());

                Util.out(out, "Of " + tested + " songs, these are the reasons for exclusion: "
                                + reasons.get(1) + " were already excluded, "
                                + reasons.get(2) + " were not encoded, "
                                + reasons.get(3) + " were played in the last 3 hours, "
                                + reasons.get(4) + " had explicit lyrics, "
                                + reasons.get(5) + " were not in mediaType " + mediaType + ", "
                                + reasons.get(6) + " were not in their genres, "
                                + reasons.get(7) + " had an implicit rating of 0.");
                Util.out(out, "There are " + good + " songs available for play");
        }
        /**
         * Gets a user's preferences for their playlists
         */
        public boolean getOptions(DBConnection conn)
        {
                int rowCount = 0;
                short tempRatio;
                short bandwidth = 0;
                // returns: ratio, factor, mediaType
                String sql = "exec sp_lcGetPreferences_xsxx " + userID;
                try
                {
                        DBResultSet rs = conn.executeSQL(sql);
                        if (!rs.getBOF() && !rs.getEOF())
                        {
                                tempRatio = (short) rs.getInt("unratedQuota");
                                if (tempRatio > 0 && tempRatio < 100)
                                        ratio = tempRatio;
                                playExplicitLyrics = rs.getBoolean("explicit");
                                // if there was no mediatype set from the parameters
                                // set it to the default
                                if (!speed.isSet())
                                        speed.set(rs.getShort("bandwidth"));

                                rowCount++;
                        }
                }
                catch (DBException oops)
                {
                        Util.debug("DB Exception in getOptions: " + oops.getMessage());
                }
                mediaType = Media.getMediaType(speed, format);
                Util.debug("Play dirty songs?: " + playExplicitLyrics);
                Util.debug("Bandwidth: " + speed.toString());
                Util.debug("Format: " + format.toString());
                Util.debug("mediaType: " + mediaType);
                return (rowCount > 0);
        }
        /**
         * Creates a playlist.
         */
        public Playlist createPlaylist(DBConnection conn)
        {
                Util.out(out, "start of createPlaylist " + timeStamp());
                Playlist playlist = new Playlist(playlistID);
```

```
                gatherMedia(conn);
                processSongs();
                playlist = makePlaylist(factor, ratio, playlistSize, playlist);
                Util.out(out, "end of createPlaylist " + timeStamp());
                return playlist;
        }
        private void logCreate(DBConnection conn)
        {
                try
                {
                        conn.executeSQL("exec sp_lcLogPlaylist_ixxx "
                                                        + userID + ", "
                                                        + djID + ", "
                                                        + moodID + ", "
                                                        + 0 + ", "
                                                        + mediaType + ", "
                                                        + elapsedTime()
                                                        );
                }
                catch (DBException e)
                {
                        Util.debug("DBException in logCreate: " + e.toString());
                }
        }
        /**
         * Creates and immediately saves a playlist.
         */
        public Playlist create(boolean save, SimplePlaylist oldPlaylist)
        {
                DBConnection conn = null;
                Playlist playlist = null;
                try
                {
                        conn = new DBConnection();
                        getOptions(conn);
                        playlist = createPlaylist(conn);
                        Util.out(out, "starting to save playlist " + timeStamp());
                        if (save)
                                playlist.save(conn, oldPlaylist);
                        logCreate(conn);
                        Util.out(out, "done saving playlist " + timeStamp());
                        conn.close();
                }
                catch (DBException oops)
                {
                        Util.out(out, "DBException in create: " + oops.getMessage());
                }
                catch (Throwable e)
                {
                        System.err.println("Generic Exception caught in PlaylistGenerator: " + e.toString());
                        e.printStackTrace();
                }
                return playlist;
        }
        public Playlist makePlaylist(int factor, int ratio, int playlistSize, Playlist playlist)
        {
                Util.out(out, "ordering..." + timeStamp());
                songs.sort(songs.explicit);
                songs.sort(songs.implicit);
                songs.sort(songs.unrated);
                Util.out(out, "finished sorting vectors at " + timeStamp());
```

```
                playlist.counts = new PickCount(userID, djID, ratio, playlistSize, songs, out);
                // set up the playlist
                playlist.userID    = this.userID;
                playlist.moodID    = this.moodID;
                playlist.djID      = this.djID;
                playlist.mediaType = this.mediaType;
                // copy the list of albums and artists recently played
                // for the RIAA rules
                playlist.albums  = (IntHash) songs.albumCounts.clone();
                playlist.artists = (IntHash) songs.artistCounts.clone();
                // pick songs
                pickSongs(playlist);
                // check if we got everything we need
                if (playlist.media.size() < playlistSize)
                {
                        Util.out(out, "We only got " + playlist.media.size() + " songs for user " + playlist.userID
+ ". Playing popular music in mediaType " + mediaType);
                        // uh oh, we didn't get enough songs; play popular stuff
                        playlist.counts.explicit = 0;
                        playlist.counts.implicit = 0;
                        playlist.counts.unrated  = playlistSize;
                        playlist.albums  = (IntHash) songs.albumCounts.clone();
                        playlist.artists = (IntHash) songs.artistCounts.clone();

                        playlist.resetSources();
                        playlist.media.removeAllElements();
                        playlist.popularOnly = true;
                        songs.importPopular(songCache.getPopular(mediaType), lastPlayed,
playExplicitLyrics);
                        pickSongs(playlist);
                }
                // pick news
                pickNews(playlist);
                Util.out(out, "picked news " + timeStamp());
                // pick ads
                pickAds(playlist);
                Util.out(out, "picked ads " + timeStamp());
                // pick tips
                pickTips(playlist);
                Util.out(out, "picked tips " + timeStamp());
                Util.out(out, "playlist has " + playlist.length() + " songs");
                Util.out(out, "shuffling playlist...");
                return playlist.shuffle();
        }
        public void pickNews(Playlist list)
        {
                list.news = songCache.randomClipList(SongInfoCache.TYPE_NEWS, mediaType,
Constants.MAX_NEWS_ITEMS);
        }
        public void pickAds(Playlist list)
        {
                list.ads = songCache.randomClipList(SongInfoCache.TYPE_AD, mediaType,
Constants.MAX_ADS);
        }
        public void pickTips(Playlist list)
        {
                list.tips = songCache.randomClipList(SongInfoCache.TYPE_TIP, mediaType,
Constants.MAX_TIPS_ITEMS);
        }
        public Playlist pickSongs (Playlist list)
        {
```

```
                Util.out(out, "start of pickSongs " + timeStamp());
610             PickList pickTypes = new PickList(list.counts);
                int pickOrder = 0;
                int iteration = 0;
                int artistID, albumID, artistCount, albumCount;
                short type;
615             SongData pick;
                SongGroup songGroup;
                while (pickTypes.size() > 0)
                {
                        iteration++;
620                     pick     = null;
                        songGroup = null;
                        // get a group to pick from
                        type = pickTypes.getRandom();
                        if (type == Song.EXPLICIT && songs.explicit.size() > 0)
625                     {
                                songGroup = songs.explicit;
                        }
                        else if (type == Song.IMPLICIT && songs.implicit.size() > 0)
                        {
630                             songGroup = songs.implicit;
                        }
                        else
                        {
                                type = Song.UNRATED;
635                             songGroup = songs.unrated;
                        }
                        // pick a random song from a group
                        pick = songGroup.pickRandom(factor);
                        // if we have none of that type, try another
640                     if (pick == null)
                        {
                                pickTypes.reAdd(type, songGroup, songs);
                                continue;
                        }
645                     artistID = pick.getArtistID();
                        albumID  = pick.getAlbumID();
                        artistCount = 0;
                        albumCount  = 0;
                        // check for RIAA compliance
650                     // various artists and soundtracks don't count
                        if (!ArtistInfo.isVariousArtists(artistID))
                                artistCount = list.artists.get(artistID);
                        albumCount  = list.albums.get(albumID);
                        if (artistCount >= Constants.RIAA_MAX_SONGS_BY_ARTIST
655                             || albumCount >= Constants.RIAA_MAX_SONGS_FROM_ALBUM)
                        {
                                pick.status.status = PickStatus.REJECTED;
                                // Util.debug("Song rejected by RIAA");
                                // we have too many from this artist or album. Try again.
660                             pickTypes.reAdd(type, songGroup, songs);
                                continue;
                        }
                        // increment the album and artist counts
                        if (!ArtistInfo.isVariousArtists(artistID))
665                             list.artists.increment(artistID);
                        list.albums.increment(albumID);
                        // add it to the playlist
                        list.append(pick);
                        pick.status.status = PickStatus.PICKED;
```

```
670                         pick.status.order = ++pickOrder;
                    }
                    songs.ordered = false;
                    Util.out(out, "end of pickSongs " + timeStamp());
                    return list;
675         }
            public void toMatrix(ServletOutputStream out, int displayType)
            {
                    songs.order();
                    String h1begin = "";
680                 String h1end = "";
                    if (displayType == Util.DISPLAY_HTML)
                    {
                            h1begin = "<P><H1>";
                            h1end = "</H1>";
685                 }
                    Util.out(out, h1begin + "Item Ratings" + h1end + Util.newLine);
                    items.print(out, songCache);
                    Util.out(out, h1begin + "Explicitly Rated Songs" + h1end + Util.newLine);
                    songs.toMatrix(out, Song.EXPLICIT, displayType);
690                 Util.out(out, h1begin + "Implicitly Rated Songs" + h1end + Util.newLine);
                    songs.toMatrix(out, Song.IMPLICIT, displayType);
                    Util.out(out, h1begin + "Unrated Songs" + h1end + Util.newLine);
                    songs.toMatrix(out, Song.UNRATED, displayType);
    //                      + h1begin + "Excluded Songs" + h1end + Util.newLine
695 //                      + songs.excludedList();
            }
            public String timeStamp()
            {
                    Date now = new Date();
700                 if (startDate == null)
                    {
                            startDate = lastDate = now;
                    }
                    double diff = (now.getTime() - lastDate.getTime()) / 1000.0;
705                 double total = (now.getTime() - startDate.getTime()) / 1000.0;
                    lastDate = now;
                    return Util.newLine
                            + "----------------------------------------" + Util.newLine
                            + diff + " lap time, " + total + " total" + Util.newLine
710                         + "----------------------------------------" + Util.newLine;
            }
            public double elapsedTime()
            {
                    Date now = new Date();
715                 if (startDate == null)
                    {
                            startDate = lastDate = now;
                    }
                    return (now.getTime() - startDate.getTime()) / 1000.0;
720         }
    }
```

PlaylistGeneratorServlet

```
package com.launch.PlaylistGenerator;

import java.io.*;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletConfig;
import javax.servlet.ServletException;
import javax.servlet.ServletOutputStream;
import java.util.*;
/**
*-------------------------------------------------------------------
*
* PlaylistGeneratorServlet.java 6/30/99
* Servlet that creates LAUNCHcast playlists
* Copyright (c) 1999 Launch, Inc.
* @author Jeff Boulter
*-------------------------------------------------------------------
*/
public class PlaylistGeneratorServlet extends HttpServlet {

        SongInfoCache songCache;
        Thread cacheUpdater;

        public void generatePlaylist(HttpServletRequest        request,
                HttpServletResponse        response) throws IOException
        {

                // get stream for output
                ServletOutputStream out = response.getOutputStream();
                GeneratorParameters prop = new GeneratorParameters(request);
                if (prop.debug())
                        response.setContentType("text/plain");
                else
                        response.setContentType("video/x-ms-asf");

                PlaylistParameters params = new PlaylistParameters(prop);
                PlaylistStatus status     = new PlaylistStatus(prop.userID());
                status.init(out);
                if (prop.debug())
                        out.print(status.toString());

                boolean generate = true;
                // no need to regenerate right now, use an old playlist
                if (prop.forceRefresh())
                {
                        if (prop.debug()) out.println("generating because forceRefresh is on");
                }
                else if (status.isStale())
                {
                        if (prop.debug()) out.println("generating because the playlist is stale");
                }
                else if (prop.speed().isSet() && (prop.speed().get() != status.speed.get()))
        {
                        if (prop.debug()) out.println("generating because the mediaTypes are different");
                }
                else if (prop.format().isSet() && (prop.format().get() != status.format.get()))
                {
```

```
60                      if (prop.debug()) out.println("generating because the media formats are different");
                }
                else if (prop.moodID() != status.moodID)
        {
                        if (prop.debug()) out.println("generating because the moods are different");
65              }
                else if (prop.djID() != status.djID)
                {
                        if (prop.debug()) out.println("generating because the djs are different");
                }
70              else
                        generate = false;

                if (!generate) // we can use an old playlist
                {
75
                        // reset the ad, news, and tip dates

                        if (status.playlist != null)
                        {
80                              status.resetDates();
                        }

                        Playlist playlist = new Playlist();
                        playlist.userID   = status.userID;
85
                        out.print(playlist.toASX());



90              }
                else // we have to generate the playlist
                {

                        ServletOutputStream outStream = null;
95
                        if (prop.debug())
                        {
                                outStream = out;
                                out.println("regenerating playlist with parameters: " + params.toString() +
100     "<PRE>");
                                out.flush();
                        }
                        PlaylistGenerator gen = new PlaylistGenerator(params, songCache, outStream);
                        Playlist playlist = gen.create(!prop.dontsave(), null);
105
                        if (prop.debug())
                        {
                                out.println("</PRE>");
                                if (prop.debugFormat() == Util.DISPLAY_TEXT)
110                                     out.println("<PRE>");
                                out.println(playlist.toString()
                                                                + "<P>");
                                if (prop.matrix())
                                {
115     //                              out.println("<FONT SIZE=-1>");
                                        gen.toMatrix(out, prop.debugFormat());
        //                              out.println("</FONT>");
                                }
                                if (prop.debugFormat() == Util.DISPLAY_TEXT)
120                                     out.println("</PRE>");
```

```
                        out.println("<XMP>" + playlist.toASX() + "</XMP>");
                }
                else
                        out.print(playlist.toASX());

        }

        out.close();
}
public void refreshPlaylist(HttpServletRequest          request,
        HttpServletResponse       response) throws IOException
{
        // get stream for output
        ServletOutputStream out = response.getOutputStream();
        response.setContentType("text/plain");
        // this is the stuff coming in on the query string
        GeneratorParameters prop = new GeneratorParameters(request);
        PlaylistParameters params = new PlaylistParameters(prop);

        // this is what's in their current playlist
        PlaylistStatus status = new PlaylistStatus(prop.userID());
        status.init(out);


        if (prop.debug())
                out.print(status.toString());

        if (status.isStale())
        {

                ServletOutputStream outStream = null;

                params = new PlaylistParameters(status);
                if (prop.debug())
                {
                        outStream = out;
                        out.println("refreshing playlist with parameters: " + params.toString());
                        out.flush();
                }

                PlaylistGenerator gen = new PlaylistGenerator(params, songCache, outStream);
                Playlist playlist     = gen.create(!prop.dontsave(), status.playlist);

        }
        else
        {
                out.println("No need to refresh playlist now");
        }

        out.close();
}
public void doGet (
        HttpServletRequest          request,
        HttpServletResponse         response
        ) throws ServletException, IOException {
        try
        {

                //Util.debug("PlaylistGeneratorServlet recieved a Get");
                // prevent caching
                response.setHeader("Pragma", "no-cache");
```

```
                        response.setHeader("Cache-control", "no-cache");
                        response.setHeader("Expires", "0");

                        // figure out what we need to do
                        String actionStr = request.getParameter("action");
                        if (actionStr == null)
                                actionStr = new String("generate");
                        if (actionStr.equals("refresh"))
                        {
                                refreshPlaylist(request, response);
                        }
                        else if (actionStr.equals("cachestatus"))
                        {
                                ServletOutputStream out = response.getOutputStream();
                                response.setContentType("text/plain");
                                songCache.ratingsCache.status(out, request.getParameter("detail") != null);

                                out.close();
                        }
                        else  //default action
                        {
                                generatePlaylist(request, response);
                        }
                }
                catch (Throwable e)
                {
                        System.err.println(new Date().toString() + " Caught an exception in doGet: " +
e.toString());
                        e.printStackTrace();
                }
        }
        public void doPost(HttpServletRequest req, HttpServletResponse resp) throws ServletException,
IOException
        {
                Util.debug("PlaylistGeneratorServlet recieved a Post");
                try
                {
                        String user_agent=req.getHeader("USER_AGENT");

                        if (user_agent.equals(com.launch.misc.constants.PLAYLIST_SERVER))
                        {
                                // need to generate play list and return it
                                GeneratorParameters prop = new GeneratorParameters(req);
                                PlaylistParameters params = new PlaylistParameters(prop);
                                PlaylistGenerator gen = new PlaylistGenerator(params, songCache, null);
                                Playlist playlist = gen.create(true, null);

                                Playlist2 playlist2 = playlist.toPlaylist2();

                                ObjectOutputStream oos=new ObjectOutputStream(resp.getOutputStream());
                                oos.writeObject(playlist2);
                                oos.flush();
                                oos.close();
                        }
                        else if (user_agent.equals(com.launch.misc.constants.RATING_WIDGET))
                        {
                                // need to update cache with new info

                                int data_size=req.getContentLength();
                                byte b[]=new byte[data_size];
                                req.getInputStream().read(b,0,data_size);
```

```
                                        Vector v=(Vector)(new ObjectInputStream(new
ByteArrayInputStream(b))).readObject();
                                        Util.debug("received a list of changed ratings " + v);
                                        // need to tell cache of these changes
                                        Enumeration e=v.elements();
                                        while (e.hasMoreElements())
                                        {
songCache.ratingsCache.putIntoCache((CachedRating)e.nextElement());
                                        }
                                }
                                else
                                {
                                        System.err.println("PlaylistGeneratorServlet received a post from an unknown
person : " + user_agent);
                                }
                        }
                        catch (Throwable t)
                        {
                                t.printStackTrace();
                        }
                }
                /**
                 * Initialization method -
                 *
                 */
                public void init (ServletConfig config) throws ServletException
                {
                        super.init(config);
                        songCache = new SongInfoCache(null);
                        // start the updater thread
                        cacheUpdater = new SongInfoCacheUpdater(this);
                        cacheUpdater.setPriority(Thread.MIN_PRIORITY);
                        cacheUpdater.start();

                        songCache.ratingsCache = new RatingsCache();

                }
                /**
                 * Destroy method -
                 * get rid of the api
                 * servlets "should have" a destroy method for garbage collection
                 */
                public void destroy()
                {
                        cacheUpdater.stop();
                        cacheUpdater = null;
                        songCache    = null;
                }
}
```

PlaylistMaker

```
package com.launch.PlaylistGenerator;
import javax.servlet.ServletOutputStream;
/**
 * this is the dumb class for ASP
 */
public class PlaylistMaker
{
	public PlaylistGenerator generator;
	public Playlist playlist;

	public PlaylistMaker()
	{
		generator = new PlaylistGenerator();
	}

	public void init(int userID, int djID, short mediaType, int moodID, int playlistID)
	{
		// generator.init(userID, djID, moodID);
	}
	public int make()
	{
		playlist = generator.create(false, null);

		return playlist.ID;
	}
	public int makeAndSave()
	{

		playlist = generator.create(true, null);
		return playlist.ID;

	}

	public void toMatrix(ServletOutputStream out, int displayType)
	{
		generator.toMatrix(out, displayType);
	}

	public String toASX()
	{
		return playlist.toASX();
	}

}
```

PlaylistParameters

```
package com.launch.PlaylistGenerator;
public class PlaylistParameters
{

        int userID;
        int djID;
        int playlistSize = Constants.DEFAULT_PLAYLIST_SIZE;
        int moodID;
        Bandwidth speed = new Bandwidth();
        MediaFormat format = new MediaFormat();
        public PlaylistParameters(int userID)
        {
                this.userID = djID = userID;
        }

        public PlaylistParameters(int userID, Bandwidth speed, int moodID)
        {
                this(userID);

                if (speed != null)
                {
                        this.speed = speed;
                }

                this.moodID = moodID;
        }
        public PlaylistParameters(int userID, Bandwidth speed, int moodID, int djID)
        {
                this(userID, speed, moodID);

                if (djID > 0)
                        this.djID = djID;
        }
        public PlaylistParameters(PlaylistStatus status)
        {
                this(status.userID, status.speed, status.moodID, status.djID);
        }

        public PlaylistParameters(GeneratorParameters prop)
        {
                this(prop.userID(), prop.speed(), prop.moodID(), prop.djID());
        }

        public String toString()
        {
                return "userID=" + userID + ", "
                        + "bandwidth=" + speed.toString() + ", "
                        + "moodID=" + moodID + ", "
                        + "djID=" + djID;
        }

}
```

PlaylistStatus

```
package com.launch.PlaylistGenerator;
import java.util.Date;
import javax.servlet.ServletOutputStream;
public class PlaylistStatus
{
	int userID, newRatingsCount, moodID, djID, songsRemaining;
	short mediaType;

	Date lastPlaylist = new Date();

	MediaFormat format;
	Bandwidth speed;

	Date dbDate = new Date();

	public SimplePlaylist playlist;

	public PlaylistStatus(int userID)
	{
		format = new MediaFormat(MediaFormat.WINDOWSMEDIA);
		this.userID = userID;
	}

	public String toString()
	{
		return "Playlist status for userID " + userID + ":" + Util.newLine
			+ " newRatingsCount: " + newRatingsCount + Util.newLine
			+ " moodID: " + moodID + Util.newLine
			+ " djID: " + djID + Util.newLine
			+ " songsRemaining: " + songsRemaining + Util.newLine
			+ " mediaType: " + mediaType + Util.newLine;
	}

	public void init(ServletOutputStream out)
	{
		try
		{
			DBConnection conn = new DBConnection();

			DBResultSet rs = conn.executeSQL("exec sp_lcGetPlaylistInfoForUser_xsxx " +
userID);

			while (!rs.getBOF() && !rs.getEOF())
			{
				newRatingsCount = rs.getInt("newRatingsCount");
				lastPlaylist	= rs.getTimestamp("lastPlaylist");
				dbDate		= rs.getTimestamp("dbDate");
				playlist	= SimplePlaylist.fromBytes(rs.getBytes("playlist"));
				rs.next();
			}

			if (playlist != null)
			{
				songsRemaining = playlist.songs.size();
				moodID		= playlist.moodID;
				djID		= playlist.djID;
				mediaType	= playlist.mediaType;
				speed		= Media.typeToBandwidth(mediaType);
```

```
60                      }

                        conn.close();
                }
                catch (DBException oops)
65              {
                        Util.out(out, "DBException in PlaylistStatus.init: " + oops.toString());
                }

        }
70
        public void resetDates()
        {
                if (playlist == null)
                        return;
75
                Util.debug(new Date().toString() + " Playlist OK, just resetting dates for userID " + userID);
                playlist.resetDates(dbDate);
                playlist.save(userID);
        }
80
        public boolean isStale()
        {

                double oneWeek = Util.MILLISECONDS_IN_SECOND *
85                                                  Util.SECONDS_IN_MINUTE *
                                                    Util.MINUTES_IN_HOUR *
                                                    Util.HOURS_IN_DAY *
                                                    Util.DAYS_IN_WEEK;

90              if (songsRemaining <= Constants.REFRESH_AT_SONGS_LEFT)
                        return true;

                // if you're listening to someone else's station, your new ratings
                // won't make a difference
95              if (newRatingsCount >= Constants.REFRESH_AT_NEW_RATINGS_COUNT && userID ==
djID)
                        return true;

                if (new Date().getTime() - lastPlaylist.getTime() > oneWeek)
100                     return true;

                return false;
        }

105     /*
        public void flushPlaylist(ServletOutputStream out)
        {
                try
                {
110                     DBConnection conn = new DBConnection();
                        DBResultSet rs = conn.executeSQL("exec sp_lcFlushPlaylist_xxud " + userID);
                        conn.close();
                }
                catch (DBException oops)
115             {
                        Util.out(out, "DBException in PlaylistStatus::flushPlaylist: " + oops.toString());
                }
        }

120     public void deletePlaylist(ServletOutputStream out)
```

```
        {
            try
            {
                DBConnection conn = new DBConnection();
125             DBResultSet rs = conn.executeSQL("exec sp_lcDeletePlaylist_xxud " + userID);
                conn.close();
            }
            catch (DBException oops)
            {
130             Util.out(out, "DBException in PlaylistStatus::deletePlaylist: " + oops.toString());
            }
        }


135     public void resetClipSchedule()
        {
            try
            {
                DBConnection conn = new DBConnection();
140             DBResultSet rs = conn.executeSQL("exec sp_lcResetClipSchedule_xxux " + userID);
                conn.close();
            }
            catch (DBException oops)
            {
145             Util.debug("DBException in PlaylistStatus::resetDates: " + oops.toString());
            }
        }
        */
    }
150 PlaylistStatus.java      Page 3 of 3      11/05/99 1:24 PM
```

PopularSongs

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.util.Hashtable;
import java.util.Enumeration;
public class PopularSongs
{
	private Hashtable byMedia;

	public SongList get(short mediaType)
	{
		return (SongList) byMedia.get(new Short(mediaType));
	}

	public PopularSongs(Hashtable songs, Hashtable mediaTypes)
	{
		byMedia = new Hashtable(1);

		// make a list of all songs and sort them
		SongList all = new SongList(songs);
		all.sort();

		// create each of the song lists
		for (Enumeration e = mediaTypes.keys(); e.hasMoreElements();)
		{
			Short mediaType = new Short(((Integer) e.nextElement()).shortValue());
			byMedia.put(mediaType, new SongList());
		}

		SongInfo info;
		Media track;
		SongList list;

		// put each into a separate list for each mediaType
		for (int i = 0; i < all.size(); i++)
		{
			info = all.elementAt(i);

			for (int j = 0; j < info.media.size(); j++)
			{
				track = info.media.typeAt(j);
				list = ((SongList) byMedia.get(new Short(track.mediaType)));
				list.addElement(info);
			}

		}

		// truncate each list to the top 1000 most popular songs
		for (Enumeration e = mediaTypes.keys(); e.hasMoreElements();)
		{
			Short mediaType = new Short(((Integer) e.nextElement()).shortValue());
			list = (SongList) byMedia.get(mediaType);
			list.setSize(1000);
		}


	}
}
```

Population

```
package com.launch.PlaylistGenerator;
import java.util.Enumeration;
import java.util.Date;
import java.text.SimpleDateFormat;
import java.util.Vector;
import java.util.Hashtable;
import javax.servlet.ServletOutputStream;
import java.text.DateFormat;
public class Population
{

        /*
        private int readers = 0;
        private int writersWaiting = 0;
        private boolean writing = false;
        */

        private boolean haveTitles = false;
        public boolean ordered = false;

        public SongGroup explicit;
        public SongGroup implicit;
        public SongGroup unrated;

        private Hashtable hash;

        public IntHash artistCounts;
        public IntHash albumCounts;

        public Population()
        {
                explicit    = new SongGroup();
                implicit    = new SongGroup();
                unrated     = new SongGroup();
                artistCounts = new IntHash();
                albumCounts  = new IntHash();
                hash        = new Hashtable();
        }

        /*

        public synchronized void addReader()
        {
                ++readers;
        }

        public synchronized void removeReader()
        {
                --readers;
                if (readers == 0)
                {
                        notifyAll();
                }
        }
        public synchronized void requestWrite()
        {
                ++writersWaiting;
        }
```

```
60
        public synchronized void finishWrite()
        {
                --writersWaiting;
                if (writersWaiting == 0)
65              {
                        notifyAll();
                }
        }

70      */

        // returns this song if it's valid for adding data, null otherwise

        public synchronized Song initSong(int songID, short type)
75      {
                if (type <= 0)
                        return null;

                boolean result = true;
80              /*
                requestWrite();

                while (readers > 0)
                {
85                      try { wait(); }
                        catch (InterruptedException e) {}
                }
                writing = true;
                */
90
                Song song = get(songID);

                if (song == null)
                {
95                      song = new Song(songID, type);
                        put(songID, song);

                        // if it's excluded, it's not valid for modifying
                        if (type == Song.EXCLUDED)
100                             result = false;
                }
                else
                {
                        result = song.setType(type);
105             }

                if (result)
                        return song;

110     //      writing = false;
        //      finishWrite();
                return null;
        }

115     public synchronized SongData initSongGetData(int songID, short type)
        {
                Song aSong = initSong(songID, type);

                if (aSong == null)
120                     return null;
```

```
                return aSong.getData();
        }

        public synchronized SongData getSongData(int songID)
        {
                return getSongData(new Integer(songID));
        }

        public synchronized SongData getSongData(Integer songID)
        {
                Song s = get(songID);

                if (s == null)
                        return null;
                return s.getData();
        }


        public synchronized SongData getSongData(int songID, short type)
        {
                SongData result = null;

                /*
                synchronized (this)
                {
                        while (writersWaiting > 0)
                        {
                                try { wait(); }
                                catch (InterruptedException e) { }
                        }
                        addReader();
                }
                */

                Song song = get(songID);

                // there's no song for that ID; Did you call initSong?
                if (song != null && type >= song.getType())
                        result = song.getData();
//              removeReader();

                return result;
        }

        public synchronized Song get(int songID)
        {
                return get(new Integer(songID));
        }

        public synchronized Song get(Integer songID)
        {
                return (Song) hash.get(songID);
        }


        public synchronized Song remove(int songID)
        {
                return remove(new Integer(songID));
        }
```

```
public synchronized Song remove(Integer songID)
{
        return (Song) hash.remove(songID);
}

private synchronized Song put(int songID, Song song)
{
        return (Song) hash.put(new Integer(songID), song);
}

private int available()
{
        int i = 0;

        for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {
                Song song = get((Integer) e.nextElement());

                if (song.type != Song.EXCLUDED)
                {
                        i++;
                }
        }
        return i;
}

public Enumeration keys()
{
        return hash.keys();
}

public void order()
{
        createVectors();
        sortVectors();
}

public int excludedCount()
{
        int result = 0;

        for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {
                Song song = get(((Integer) e.nextElement()).intValue());
                if (song.type == Song.EXCLUDED)
                {
                        result++;
                }
        }

        return result;
}

public boolean isEligible(int songID, int artistID, int albumID)
{

        Song song = get(songID);

        if (song != null && song.type == Song.EXCLUDED)
                return false;

        if ((artistCounts.get(artistID) < Constants.RIAA_MAX_SONGS_BY_ARTIST)
                && (albumCounts.get(albumID) <
```

```
Constants.RIAA_MAX_SONGS_FROM_ALBUM))
                return true;

        return false;
    }


    public void createVectors()
    {

        explicit.removeAllElements();
        implicit.removeAllElements();
        unrated.removeAllElements();

        for (Enumeration e = hash.keys(); e.hasMoreElements();) {
//          Util.debug("interation " + i);
            Song mySong = get((Integer) e.nextElement());

            if (mySong != null)
            {
                SongData data = mySong.getData();

                if (mySong.type == Song.EXPLICIT)
                    explicit.addElement(data);
                else if (mySong.type == Song.IMPLICIT)
                    implicit.addElement(data);
                else if (mySong.type != Song.EXCLUDED)
                    unrated.addElement(data);
            }
        }
    }

    public void importPopular(SongList abunch, PlayDates lastPlayed, boolean playBadWords)
    {
        SongInfo info;
        SongData data;
        Song ditty;
        int added = 0;

        unrated.setSize(0);

        long now = new Date().getTime();

        long lastThreeHours = Util.MILLISECONDS_IN_SECOND *
                              Util.SECONDS_IN_MINUTE *
                              Util.MINUTES_IN_HOUR *
                              3;

        long playedTime = 0;

        Date playedAt;

        for (int i = 0; i < abunch.size(); i++)
        {
            info = abunch.elementAt(i);
            playedAt = lastPlayed.get(info.songID);

            // don't play songs twice within 3 hours
            if (playedAt == null || (now - playedAt.getTime()) > lastThreeHours)
            {
```

```
                                        if (playBadWords || !info.hasExplicitLyrics())
                                        {
                                                data = initSongGetData(info.songID, Song.UNRATED);

                                                if (data != null)
                                                {
                                                        data.setInfo(info);
                                                        unrated.addElement(data);
                                                        added++;
                                                }
                                        }
                                }
                        }

                        Util.debug("import popular added " + added + " songs");
                }

                public void sortVectors()
                {
                        sort(explicit, 0, explicit.size() - 1);
                        sort(implicit, 0, implicit.size() - 1);
                        sort(unrated,  0, unrated.size()  - 1);

        //              Util.debug("after sorting, ratedVector is: " + ratedVector.toString());
        //              Util.debug("after sorting, unratedVector is: " + unratedVector.toString());
                        ordered = true;
                }

                public void sort(Vector a)
                {
                        sort(a, 0, a.size() - 1);
                }

                private void sort(Vector a, int from, int to)
                {

                        // quicksort

                        // If there is nothing to sort, return

                        if ((a == null) || (a.size() < 2)) return;

                        int i = from, j = to;
                        SongData center = (SongData) a.elementAt((from + to) / 2);

                        do {
                                while((i < to) && (center.score < ((SongData) a.elementAt(i)).score)) i++;
                                while((j > from) && (center.score > ((SongData) a.elementAt(j)).score)) j--;
                                if (i < j) {
                                        SongData temp = (SongData) a.elementAt(i);
                                        a.setElementAt(a.elementAt(j), i);
                                        a.setElementAt(temp, j);   // swap elements
                                }

                                if (i <= j) { i++; j--; }
                        } while(i <= j);

                        if (from < j) sort(a, from, j); // recursively sort the rest
                        if (i < to) sort(a, i, to);
```

```
365         }

            public String toString()
            {

370             String result = "";

                for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {

                    int songID = ((Integer) e.nextElement()).intValue();
375                 Song song = get(songID);

                    result = result.concat("songID " + songID
                                                                + " = " + song.toString()
                                                                + Util.newLine);
380             }

                return result;
            }

385         public String sourceCount()
            {
                IntHash counts = new IntHash();
                String explicitList = "";

390             for (Enumeration e = hash.keys(); e.hasMoreElements() ;) {

                    Song song = get(((Integer) e.nextElement()).intValue());

                    if (song.getType() == Song.EXPLICIT)
395                 {
                        explicitList = explicitList.concat(song.songID + ", ");

                    }

400                 counts.increment(song.type);

                }

                return "counts: EXPLICIT = " + counts.get(Song.EXPLICIT)
405                         + " (" + explicitList + ") "
                            + " IMPLICIT = " + counts.get(Song.IMPLICIT)
                            + " EXCLUDED = " + counts.get(Song.EXCLUDED);

            }
410

            public void toMatrix(ServletOutputStream out, int songType, int displayType)
            {
                String delim = "";
415             String prefix = "";
                String suffix = "";
                String rowPrefix = "";
                String rowSuffix = "";
                String bold = "";
420             String unbold = "";

                if (displayType == Util.DISPLAY_HTML)
                {
                    delim = "</TD><TD>";
425                 prefix = "<TABLE CELLPADDING=1 CELLSPACING=0>";
```

```
                suffix = "</TABLE>";
                rowPrefix = "<TR><TD>";
                rowSuffix = "</TD></TR>";
                bold = "<B><FONT SIZE=\"-1\">";
                unbold = "</FONT></B>";
        }
        else
        {
                delim = "\t";
        }

        Util.out(out, prefix);

        String header = Util.newLine + rowPrefix + bold
                                + Util.join(unbold + delim + bold, SongData.namesArray())
                                + unbold + rowSuffix;


        Vector v = null;

        if (songType == Song.EXPLICIT)
                v = explicit;
        else if (songType == Song.IMPLICIT)
                v = implicit;
        else
                v = unrated;

        if (v != null)
        {
                for (int i = 0; i < v.size(); i++) {

                        SongData data = (SongData) v.elementAt(i);

                        if (i % 40 == 0)
                                Util.out(out, header);

                        Util.out(out, data.toDisplayString(displayType, (i + 1)));


                }
        }

        Util.out(out, suffix);
    }

}
```

Rating

```
package com.launch.PlaylistGenerator;
public class Rating
{
    protected short rating;
    protected boolean set = false;
    public Rating()
    {

    }

    /**
     * create one with a default
     */

    public Rating(short defaultRating)
    {
        rating = defaultRating;
    }

    public boolean isSet()
    {
        return set;
    }

    public void set(short newRating)
    {
        rating = newRating;
        set    = true;
    }

    public short get()
    {
        return rating;
    }

    public String toString()
    {
        if (!set)
            return rating + "(Not Set)";
        else
            return "" + rating;
    }

}
```

RatingsCache

```
package com.launch.PlaylistGenerator;
import java.util.*;
import javax.servlet.ServletOutputStream;
import java.io.IOException;
public final class RatingsCache implements GetRatingsCacheUsersInterface, Constants
{
		/**
		 * This Hashtable will be of the form
		 * (Integer userID, Hashtable CachedRating objects), if the Data in
		 * the cache is invalid the entry will be of the form
		 * (Integer userID, INVALID_DATA)
		 * <br>
		 * The Hashtable of CachedRating objects is of the form (Integer itemID, CachedRating)
		 **/
		private Hashtable ratingsList = new Hashtable(1);
		private GetRatingsCacheUsers gtu;

		private FrequencyCounter freq_counter = new
FrequencyCounter(RATINGS_CACHE_INITIAL_SIZE);

		private Date lastUpdated = new Date();
		private Date lastReset  = new Date();


	//---------------------------------------------------------------
		public RatingsCache()
		{
			gtu = new GetRatingsCacheUsers(this);
			// the following line is for testing purposes only, rem it out otherwise.
//			gtu.SLEEP_TIME=5*60*1000;
			gtu.start();
		}
		/**
		 * This method will get a list of rating for the given userids
		 * @param userid an array of ints representing userids, each entry should be a valid userID, do
not pad with zeros.
		 * @return a Vector of CachedRating objects
		 **/
		public final Vector getRatings(Vector users)
		{
			//----------
			// algorithm
			//----------
			// check for userid in hashtable
			// if found add to vector of ratings
			// else build list of unfound things
			//	get list of unfound things from database
			Vector allRatings	= new Vector();
			Integer userID;
			Hashtable ratingProfile;
			Vector nonCachedUsers = new Vector(users.size());
			Date startDate		= new Date();
			Enumeration e		= users.elements();
			while (e.hasMoreElements())
			{
				userID		= (Integer) e.nextElement();
				ratingProfile	= (Hashtable) ratingsList.get(userID);
				if (ratingProfile == null)
```

```
60                                      {
                                                Util.debug("RatingsCache MISS on user " + userID);
                                                nonCachedUsers.addElement(userID);
                                        }
                                        else
65                                      {

//                                              benchmark_date1 = new Date();
                                                Util.debug("RatingsCache HIT on user " + userID);
                                                appendToVector(allRatings, ratingProfile.elements());
70 //                                             Util.printElapsedTime("Get from cache, " + temp_hash.size() + "
entries", benchmark_date1);
                                        }
                                        freq_counter.incrementValue(userID);
                                }
75                              if (nonCachedUsers.size() > 0)
                                {
                                        MergeVectors(allRatings, getRatingsFromDatabase(nonCachedUsers));
                                }
                                Util.printElapsedTime(Thread.currentThread().getName() + ", got " + allRatings.size()
80 + " ratings ", startDate);
                                return allRatings;
                        }
                        public final void updateCachedUsers(Vector v)
                        {
85                              setCachedUserIDs(v);
                        }
                        public Hashtable getMostFrequentlyUsedUsers(int i)
                        {
                                Hashtable h = freq_counter.getLargest(i);
90                              Vector    v = new Vector(h.size());

                                // when we do this, also refresh the cache
                                // to clean out any lingering data corruption

95                              Util.debug(new Date().toString() + " Resetting ratings cache");

                                // clear the users in the cache
                                setCachedUserIDs(v);

100                             lastReset = new Date();

                                // put user hash into vector
                                appendToVector(v, h.keys());

105                             // get all the ratings
                                setCachedUserIDs(v);

                                return h;
                        }
110                     /**
                         *
                         **/
                        public final void setCachedUserIDs(Vector userIDs)
                        {
115                             lastUpdated = new Date();

                                Vector cachedUsers = (Vector) userIDs.clone();
                                Date benchmark_date = new Date();
                                if (cachedUsers.size() <= 0)
120                             {
```

```
                                ratingsList = new Hashtable(1);
                                Util.debug("setCachedUserIDs: no users passed");
                                return;
                        }
125                     Enumeration e = ratingsList.keys();
                        Integer userID;
                        // find the differences between the users already in the cache
                        // and the new list of users
                        // leave that result in cachedUsers
130
                        // interate through each user in the current cache
                        while (e.hasMoreElements())
                        {
                                userID = (Integer) e.nextElement();
135                             // are they in the new list?
                                if (cachedUsers.contains(userID))
                                {
                                        // cool, just remove them from the new list
                                        cachedUsers.removeElement(userID);
140                             }
                                else
                                {
                                        // they've been removed
                                        ratingsList.remove(userID);
145                             }
                        }
                        Vector newRatings = new Vector();

                        // get all the ratings for the new cached users
150
                        if (cachedUsers.size() > 0)
                        {
                                newRatings = getRatingsFromDatabase(cachedUsers);
                                e = newRatings.elements();
155                             while (e.hasMoreElements())
                                {
                                        putIntoCache((CachedRating) e.nextElement());
                                }
                        }
160                     else
                        {
                                Util.debug(new Date().toString() + " setCachedUserIDs: no new users in
cache");
                        }
165                     Util.printElapsedTime("refreshed cached users and loaded " + newRatings.size() + "
entries", benchmark_date);
                }
                /**
                 *
170              **/
                private final Vector getRatingsFromDatabase(Vector userIDs)
                {
                        //----------
                        // algorithm
175                     //----------
                        // query database for info
                        // build vector from resultsets.
                                Vector results = new Vector(RATINGS_CACHE_INITIAL_SIZE);
                                Date benchmark_date = new Date();
180                     //--- get item rating ---
                                GetItemRatingsFromDB itemRatings = new GetItemRatingsFromDB(userIDs,
```

```
results);
                        //--- get song rating ---
                                GetSongRatingsFromDB songRatings = new
185     GetSongRatingsFromDB(userIDs, results);
                                songRatings.start();
                                itemRatings.start();
                        //--- must wait for the two threads to finish ---
                                try
190                             {
                                        itemRatings.join();
                                        songRatings.join();
                                }
                                catch (InterruptedException e)
195                             {
                                        System.err.println("PlaylistCache: interrupted waiting for ratings, I'm
not cleanning up...");
                                }
                        //--- done getting just return values ---
200                             Util.printElapsedTime("GetRatingsFromDatabase, " + results.size() + "
entries", benchmark_date);
                                return results;
                }
                /**
205              * appends the contents of vector2 into vector1
                 **/
                private static final void MergeVectors(Vector vector1, Vector vector2)
                {
                        vector1.ensureCapacity(vector1.size() + vector2.size());
210                     Enumeration e = vector2.elements();
                        while (e.hasMoreElements())
                        {
                                vector1.addElement(e.nextElement());
                        }
215             }
                public static final void appendToVector(Vector v, Enumeration e)
                {
                        while (e.hasMoreElements())
                        {
220                             v.addElement(e.nextElement());
                        }
                }
                public static final String GetVectorAsCommaDelimitedList(Vector v)
                {
225                     if (v==null) return("");
                        String s=v.toString();
                        int vector_length=s.length();
                        if (vector_length >= 3)
                        {
230                             return(s.substring(1,vector_length-1));
                        }
                        else
                        {
                                return("");
235                     }
                }
                /**
                 * This method adds the value to the hashtable pointed to by the key, if the key does not exist yet
it will create the first entry and the Hashtable
240              **/

                public final void putIntoCache(CachedRating value)
```

```
                {
                        RatingsProfile profile = null;
245                     Integer userID = new Integer(value.userID);
                        // this could be more efficient if we inserted all the ratings for a particular user all at
    once
                        if (ratingsList.containsKey(userID))
                        {
250                             profile = (RatingsProfile) ratingsList.get(userID);
                        }
                        else
                        {
                                profile = new RatingsProfile(RATINGS_CACHE_INITIAL_SIZE);
255                             ratingsList.put(userID, profile);
                        }
                        if (value.rating < 0)
                        {
                                // unrate
260                             profile.remove(value.hashKey());
                        }
                        else
                        {
                                profile.put(value.hashKey(), value);
265                     }
                }
                public final String toString()
                {
                        return ratingsList.toString();
270             }

                public final String userList()
                {
                        String result = "";
275
                        Enumeration e = ratingsList.keys();
                        Integer userID;

                        while (e.hasMoreElements())
280                     {
                                userID = (Integer) e.nextElement();
                                result = result.concat(userID + ", ");
                        }

285                     return result;
                }

                public final void status(ServletOutputStream out, boolean detail) throws IOException
                {
290                     out.print("RatingsCache has " + ratingsList.size() + " users" + Util.newLine
                                                                        + "Last Updated at " +
    lastUpdated.toString() + Util.newLine
                                                                        + "Last Reset at " + lastReset.toString()
    + Util.newLine
295                                                                     + "UserList is " + userList() +
    Util.newLine);

                        Enumeration e = ratingsList.keys();
                        Integer userID;
300                     RatingsProfile profile;

                        while (e.hasMoreElements())
                        {
```

```
                                        userID = (Integer) e.nextElement();
305                                     out.print(Util.newLine + "Profile for userID " + userID + ":" + Util.newLine);

                                        profile = (RatingsProfile) ratingsList.get(userID);

                                        if (profile == null)
310                                     {
                                                out.print("NULL!" + Util.newLine);
                                        }
                                        else
                                        {
315                                             out.print(Util.newLine +
    profile.count(Constants.ITEM_TYPE_SONG) + " songs, "
                                                                                                +
    profile.count(Constants.ITEM_TYPE_ALBUM) + " albums, "
                                                                                                +
320 profile.count(Constants.ITEM_TYPE_ARTIST) + " artists, "
                                                                                                + profile.count((byte)
    0) + " total" + Util.newLine);

                                                if (detail)
325                                                     out.print(profile.toString());
                                        }
                                }
                        }
    }
330 RatingsCache.java       Page 2 of 7     11/05/99 1:23 PM
```

RatingsProfile

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
import java.util.Enumeration;
public class RatingsProfile extends Hashtable
{
	public RatingsProfile(int capacity)
	{
		super(capacity);
	}

	public int count(byte type)
	{
		int count = 0;

		if (type <= 0)
			return size();
		else
		{
			Enumeration e = keys();

			String key;

			CachedRating rating;

			while (e.hasMoreElements())
			{
				key = (String) e.nextElement();

				rating = get(key);

				if (rating.type == type)
					count++;
			}
		}

		return count;
	}

	public CachedRating get(String key)
	{
		return (CachedRating) super.get(key);
	}

	public String toString()
	{
		String result = "";
		Enumeration e = keys();

		while (e.hasMoreElements())
		{
			result = result.concat((get((String) e.nextElement())).toString());
		}

		return result;
	}
}
```

RatingWidgetServlet

```
package com.launch.PlaylistGenerator;
import java.util.*;
import java.io.*;
import java.net.*;
import javax.servlet.*;
import javax.servlet.http.*;
/**
*-------------------------------------------------------------------
*
* RatingWidgetServlet.java 7/8/99
* Initial Servlet for ratings Widget
* Copyright (c) 1999 LAUNCH Media, Inc.
* @author Jon Heiner
*-------------------------------------------------------------------
*/
public class RatingWidgetServlet extends HttpServlet implements GetRatingsCacheUsersInterface,
GetPlaylistServersInterface, Runnable
{
        private Vector cachedUsers = new Vector(1);
        private GetRatingsCacheUsers gtu;
        private Vector playlistServers = new Vector(1);
        private GetPlaylistServers gps;
        /** This vector contains CachedRating objects */
        private Vector dirtyRatings = new
Vector(Constants.RATING_UPDATE_LIST_INITIAL_SIZE);
        private Thread myThread;
    //------------------------
        /**
         * Handle requests...
         */
        public void doGet (
                HttpServletRequest      request,
                HttpServletResponse     response
                ) throws ServletException, IOException
        {
                String sEvent;
                String sRater;
                String sRatee;
                int iRateeType;
                String sRating;
                int raterID = 0;

                // get parameters
                sEvent = request.getParameter("action");
                // get stream for output
                ServletOutputStream out;
                response.setContentType("text/plain");
                response.setHeader("Pragma", "no-cache");
                response.setHeader("Cache-control", "no-cache");
                response.setHeader("Expires", "0");

                out = response.getOutputStream();
                try
                {
                        DBConnection conn = new DBConnection();
                        if (sEvent.equals("INIT"))
                        {
                                sRater = request.getParameter("rater");
```

```
60                                      sRatee = request.getParameter("ratee");
                                        iRateeType = Integer.parseInt( request.getParameter("ratee_type") );
                                        int rating      = -1; // not rated
                                        boolean implicit = false;
                                        String sql = "";
65                                      // SONG case
                                        if (iRateeType == Constants.ITEM_TYPE_SONG)
                                        {
                                                sql = "exec sp_lcGetSongInfoSummary_xsxx "
70                              + sRater + ","
                                + sRatee;
                                        }
                                        else if (iRateeType == Constants.ITEM_TYPE_ALBUM)
75                                      {
                                                sql = "exec sp_lcGetArtistOrAlbumRating_xsxx "
                                + sRatee + ","
80                              + sRater;
                                        }
                                        else
                                        {
                                                sql = "exec sp_lcGetArtistOrAlbumRating_xsxx "
85
                                + sRatee + ","
                                + sRater;
                                        }
90
                                        DBResultSet rs = conn.executeSQL(sql);
                                        if (!rs.getBOF() && !rs.getEOF())
                                                rating = rs.getInt("rating");
                                        out.println("rating_value=" + rating +
95      "&Implicit_indicator=not_implicit");
                                }
                                else if (sEvent.equals("RATING_EVENT"))
                                {
                                        /* Do update to LaunchCast Ratings Database */
100                                     sRater    = request.getParameter("rater");

                                        try
                                        {
                                                raterID = Integer.parseInt(sRater);
105                                     }
                                        catch (NumberFormatException e)
                                        {
                                                throw new Exception("RatingWidgetServlet: rating received
        for invalid user: " + sRater);
110                                     }

                                        if (raterID <= 0)
                                        {
                                                throw new Exception("RatingWidgetServlet: rating received
115     for invalid user: " + raterID);
                                        }

                                        sRatee    = request.getParameter("ratee");
                                        iRateeType = Integer.parseInt( request.getParameter("ratee_type") );
120                                     sRating   = request.getParameter("rating");
```

```
                                        // song case
                                        if (iRateeType == Constants.ITEM_TYPE_SONG)
                                        {
                                                conn.executeUpdate("exec sp_lcRateSongUser_isux "
125
                                + raterID + ","

                                + sRatee + ","

130                             + sRating, true);
                                        }
                                        // album case
                                        else if (iRateeType == Constants.ITEM_TYPE_ALBUM)
                                        {
135                                             conn.executeUpdate("exec sp_lcRateItemUser_isux "

                                + raterID + ","

                                + sRatee + ","
140
                                + sRating, true);
                                        }
                                        // artist case
                                        else
145                                     {
                                                conn.executeUpdate("exec sp_lcRateItemUser_isux "

                                + raterID + ","

150                             + sRatee + ","

                                + sRating, true);
                                        }
                                        out.println("confirmation=rating_confirmed");
155                                     if (cachedUsers.contains(new Integer(raterID)))
                                        {
                                                CachedRating cr = new CachedRating(raterID,
Integer.parseInt(sRatee), Byte.parseByte(sRating), (byte)iRateeType);
                                                dirtyRatings.addElement(cr);
160                                             Util.debug("Added change to ratings cache update queue : "
+ cr);
                                        }
                                }
                                else
165                             {
                                        out.println("error");
                                }
                                conn.close();
                        }
170                     catch(DBException e) {
                                out.println("DBException: " + e.getMessage());
                                System.err.println(new Date().toString() + " DBException in
RatingWidgetServlet: " + e.toString());
                        }
175                     catch(Exception e) {
                                out.println("Exception raised: " + e);
                                System.err.println(new Date().toString() + " Exception in
RatingWidgetServlet: " + e.toString());
                        }
180                     out.close();
                }
```

```
                public void init (ServletConfig config)
                        throws ServletException {
                        super.init(config);
185                     try {
                                gtu = new GetRatingsCacheUsers(this);
                                gps = new GetPlaylistServers(this);
                                // the following 2 lines are for testing purposes only, rem them out otherwise.
                //                      gtu.SLEEP_TIME=1*20*1000;
190             //                      gps.SLEEP_TIME=1*20*1000;
                                gps.start();
                                gtu.start();
                                myThread = new Thread(this);
                                myThread.start();
195                     }
                        catch (Exception e) { throw new ServletException (); }
                }
                /**
                 * Destroy method -
200              * get rid of the api
                 * servlets "should have" a destroy method for garbage collection
                 */
                public void destroy() {
                        gps.stop();
205                     gtu.stop();
                }
        //-----------------------
                public void updateCachedUsers(Vector topUsers)
                {
210                     cachedUsers = topUsers;
                }
                public void updatePlaylistServers(Vector v)
                {
                        playlistServers = v;
215             }
                public void run()
                {
                        // once every N minutes go update all cached ratings with some new ratings
                        Util.debug("RatingWidgetServlet notify playlistgenerators of changed rating - thread
220     started");
                        try
                        {
                                Vector temp_dirty_ratings;
                                Enumeration enum;
225                             Socket s;
                                ByteArrayOutputStream baos;
                                ObjectOutputStream oos;
                                OutputStream os;
                                BufferedWriter bw;
230                             byte b[];
                                String server_ip = null;
                                while (dirtyRatings != null)
                                {

235                                     try
                                        {

                                                if (dirtyRatings.size() > 0)
                                                {
240                                                     baos = new ByteArrayOutputStream(1000);
                                                        oos  = new ObjectOutputStream(baos);
                                                        temp_dirty_ratings = dirtyRatings;
```

```
                                                dirtyRatings      = new
Vector(Constants.RATING_UPDATE_LIST_INITIAL_SIZE);
                                                // need to send info to cached servers here.
                                                oos.writeObject(temp_dirty_ratings);
                                                oos.flush();
                                                b=baos.toByteArray();
                                                enum = playlistServers.elements();
                                                while (enum.hasMoreElements())
                                                {
                                                        try // this nested try / catch is so if one
server is down the others get updated too.
                                                        {

        server_ip=(String)enum.nextElement();
                                                                Util.debug(new Date().toString()
+ " RatingWidgetServlet: Sending changed ratings to : " + server_ip + " this vector : " + temp_dirty_ratings);
                                                                s=new Socket(server_ip,
Constants.PORT_NUMBER);
                                                                os=s.getOutputStream();
                                                                bw=new BufferedWriter(new
OutputStreamWriter(os));

        bw.write(Constants.POST_HEADER);
                                                                bw.newLine();

        bw.write(com.launch.misc.constants.USER_AGENT + ": " +
com.launch.misc.constants.RATING_WIDGET);
                                                                bw.newLine();
                                                                bw.write("Content-length: " +
b.length);
                                                                bw.newLine();
                                                                bw.newLine();
                                                                bw.flush();
                                                                os.write(b);
                                                                os.flush();
                                                                os.close();
                                                        }
                                                        catch (Exception e1)
                                                        {
                                                                System.err.println((new
Date()).toString() + " Error contacting ratings cache at " + server_ip);
                                                                //e1.printStackTrace();
                                                        }
                                                }
                                        }

                                }
                                catch (Exception e2)
                                {
                                        System.err.println((new Date()).toString() + " Error in
RatingWidgetServlet CacheUpdater while loop");
                                        e2.printStackTrace();
                                }

        Thread.sleep(Constants.PROPAGATE_DIRTY_RATING_SLEEP_TIME);
                                }
                        }
                        catch (Exception e)
                        {
                                System.err.println(new Date().toString() + " Fatal Error in RatingWidgetServet
updater thread ");
```

```
                                        e.printStackTrace();
305                                 }
                                    Util.debug("RatingWidgetServlet notify playlistgenerators of changed rating - thread
    done");
                            }
                            public Hashtable getMostFrequentlyUsedUsers(int i)
310                         {
                                    return null;
                            }
    }
    /* eof */
315 RatingWidgetServlet.java Page 7 of 7        11/05/99 1:35 PM
```

RecList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
/**
 * Launch Media, Inc Copyright 1999
 *
 * Recommendation List - class which encapsulates
 * recommendations coming from the net perceptions engine
 *
 * RECOMMENDED USAGE
 * to access values within a RecList object:
 *
 *
 * void someFunction(RecList aRec) {
 *
 *      if ( aRec.setToFirstRec() ) {
 *          do {
 *          System.out.println( aRec.getIdentifier() + " : " + aRec.getPredictedRating() );
 *          } while  aRec.increment() ;
 *      }
 * }
 *
 *
 *
 * The "prediction result" object in net perceptions is NOT
 * persistent so is unusable outside of a carefully controlled
 * environment
 *
 * Further, developers within LAUNCH should not be exposed
 * to Net Perceptions data structures (as they are ugly)
 *
 * file: launchNetP.java
 * @author Jon Heiner
 * @since 7-30-99
 */
public class RecList {
    private final static int kGrowVectorBy = 4;
    private Vector theRecs;
    private int theNumRecs = 0;
    private int theIndex = 1;
    /* Rec -- inner class
     * encapsulates the ID and predicted
     * value for the item in the list;
     * the inner values are made public
     * for convenience; they are exposed
     * to this class, but are not intented
     * to be used outside of this implementation
     */
    public class Rec {
        public int theID;
        public float theValue;
        /* Rec - creation method
         * the variables should be immutable
         */
        public Rec(int iID, float fValue) {
            theValue = fValue;
            theID = iID;
        }
    }
```

```
60          /** RecList - creation method
             * creates an empty rec list, which we will then add
             * Recs to; if you try to pull values from this it will
             * indicate that this is not possible
             */
65          public RecList() {
                    theRecs = new Vector(0, kGrowVectorBy); // create an empty vector
            }
            /** RecList - creation method w/ args
             * creates a rec list with one element; use the add
70           * method to add more values to it
             */
            public RecList(int iID, float fValue) {
                    theRecs = new Vector(0, kGrowVectorBy); // create an empty vector
                    this.add(iID, fValue);
75          }
            /** compact
             * called once the RecList has been created and
             * all items are added
             */
80          public void compact() {
                    theRecs.trimToSize();
            }
            /** setToFirstRec
             * called to set us to the first rec
85           * if this returns false, then there are
             * no recommendations in the list.
             */
            public boolean setToFirstRec() {
                    theIndex = 0;
90                  if (theNumRecs > 0) return true;
                    return false;
            }

            /** increment
95           * moves the internal pointer to the next item
             * returns false if there are no more Recs in
             * the list.
             */
            public boolean increment() {
100                 theIndex++;
                    if (theIndex < theNumRecs) return true;
                    return false;
            }
            /** getidentifier
105          * returns the item ID for the current item
             * in the Rec List
             */
            public int getIdentifier() {
                    return (int) ((Rec) theRecs.elementAt(theIndex)).theID;
110         }
            /** getPredictedRating
             * returns the percentage value which is the
             * predicted value
             */
115         public float getPredictedRating() {
                    return (float) ((Rec) theRecs.elementAt(theIndex)).theValue;
            }
            /** add
             * adds a new value to the Rec list
120          * returns false if the values entered
```

```
         * are invalid; (e.g.: iId < 0)
         */
        public void add(int iID, float fValue) {
                theNumRecs++;
125             theRecs.addElement(new Rec(iID, fValue) );
        }

        /** length
         * returns the number of elements in the Rec list
130      */
        public int length() {
                return theNumRecs;
        }
        /** createStubRecList
135      * used to return "good" bogus values rather
         * than values generated from Net Perceptions
         * useful for testing and stubbing
         */
        public static RecList createStubRecList() {
140             RecList aRecList = new RecList(74082, (float) 0.5);
                aRecList.add(116377, (float) 0.6);
                aRecList.add(123312, (float) 0.7);
                aRecList.add(899, (float) 0.8);
                aRecList.add(58075, (float) 0.9);
145             return aRecList;
        }
        /** test
         * test class
         */
150     public static class Test {

                /*
                public static void main(String [] args) {
                        System.out.println( "debug 0");
155                     RecList aRec = createStubRecList();

                        System.out.println( "debug 1");
                        if ( aRec.setToFirstRec() ) {
                        System.out.println( "debug 2");
160                             do {
                        System.out.println( "debug 3");
                                System.out.println( aRec.getIdentifier() + " : " + aRec.getPredictedRating() );

                        System.out.println( "debug 4");
165                             } while ( aRec.increment() );
                        }
                }
                */
        }
170 }
```

SaveClips

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.util.Date;
public class SaveClips extends Thread
{
	Vector clips;
	String storedProc;
	int ordinal;
	short mediaType;
	int userID;

	public SaveClips(Vector clips, String storedProc, int ordinal, short mediaType, int userID)
	{
		this.clips     = clips;
		this.storedProc = storedProc;
		this.mediaType  = mediaType;
		this.userID     = userID;
		this.ordinal    = ordinal;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("SaveClips for " + storedProc);

		int rowCount = 0;

		if (clips.size() <= 0)
			return;

		try
		{
			DBConnection conn = new DBConnection();
			String sql = "";

			Clip aClip;

			for (int i = 0; i < clips.size(); i++)
			{
				aClip = (Clip) clips.elementAt(i);

				sql = sql.concat(" exec " + storedProc + " "
					+ ordinal + ", "
					+ aClip.media.getID(mediaType) + ", "
					+ mediaType + ", "
					+ userID);

				ordinal++;
				rowCount++;
			}



			conn.executeSQL(sql);

			conn.close();
		}
		catch (DBException oops)
		{
```

```
60                      Util.debug("DB Exception: " + oops.getMessage());
                    }

                    Util.debug(Thread.currentThread().getName() + " saved " + rowCount + " clips");
                    Util.printElapsedTime(Thread.currentThread().getName(), startDate);
65              }
        }
```

SavePlaylist

```
package com.launch.PlaylistGenerator;
import java.util.Date;
public class SavePlaylist extends Thread
{
	Playlist list;
	int ordinal, to, from;

	public SavePlaylist(Playlist list, int from, int to, int ordinal)
	{
		this.list    = list;
		this.ordinal = ordinal;
		this.to      = to;
		this.from    = from;
	}
	public void run()
	{
		Date startDate = new Date();
		Thread.currentThread().setName("SavePlaylist (" + from + "-" + to + ")");

		int rowCount = 0;

		try
		{
			DBConnection conn = new DBConnection();
			String sql = "";

			SongData data;
			short origin;

			for (int i = from; i < to; i++)
			{
				data = (SongData) list.media.elementAt(i);

				if (list.popularOnly)
					origin = (short) SongData.SOURCE_FORCED_POPULAR;
				else
					origin = (short) data.origin();

				if (data.querySource == SongData.SOURCE_RATED)
					origin = (short) data.rating.getSource();

				//
				sql = sql.concat(" exec sp_lcSaveMediaPlaylist_ixxd "
					+ ordinal + ", "
					+ data.getMediaID(list.mediaType) + ", "
					+ list.mediaType + ", "
					+ list.userID + ", "
					+ data.implicit + ", "
					+ origin);

				ordinal++;
				rowCount++;
			}
			conn.executeSQL(sql);
			conn.close();
		}
		catch (DBException oops)
		{
```

```
60                          Util.debug("DB Exception: " + oops.getMessage());
                        }

                        Util.debug(Thread.currentThread().getName() + " saved " + rowCount + " songs");
                        Util.printElapsedTime(Thread.currentThread().getName(), startDate);
65              }
        }
```

SimpleClip

```
package com.launch.PlaylistGenerator;
import java.io.Serializable;
public class SimpleClip implements Serializable
{
	int mediaID;
	int ID;
	byte origin;
	public String toString()
	{
		return "clipID=" + ID + ", mediaID=" + mediaID + ", origin=" + origin;
	}

	/**
	 * Contructor for ads, news, tips
	 */
	public SimpleClip(int ID, int mediaID)
	{
		this.mediaID = mediaID;
		this.ID  = ID;
	}

	/**
	 * Constructor for songs
	 */
	public SimpleClip(int ID, int mediaID, byte origin)
	{
		this(ID, mediaID);
		this.origin = origin;
	}
}
```

SimpleClipList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class SimpleClipList extends Vector
{

        public SimpleClipList(int size)
        {
                super(size);
        }

        public SimpleClip pop()
        {
                if (size() > 0)
                {
                        SimpleClip clip = (SimpleClip) elementAt(0);
                        removeElementAt(0);
                        return clip;
                }

                return null;
        }

}
```

SimplePlaylist

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.io.Serializable;
import java.io.ByteArrayOutputStream;
import java.io.ObjectOutputStream;
import java.io.ObjectInputStream;
import java.io.ByteArrayInputStream;
import java.util.Date;
public class SimplePlaylist implements Serializable
{
	SimpleClipList news  = new SimpleClipList(10);
	SimpleClipList ads   = new SimpleClipList(10);
	SimpleClipList tips  = new SimpleClipList(10);
	SimpleClipList songs = new SimpleClipList(50);

	Date lastAd;
	Date lastNews;
	Date lastTip;

	short mediaType;
	int moodID;
	int djID;

	public String toString()
	{
		return "ads="   + ads.toString()   + ", " +
			"news="  + news.toString()  + ", " +
			"songs=" + songs.toString() + ", " +
			"tips="  + tips.toString();

	}

	public void resetDates(Date newDate)
	{
		lastAd = lastNews = lastTip = newDate;
	}

	public void save(int userID)
	{

		try
		{
			DBConnection conn = new DBConnection();
			save(conn, userID);
		}
		catch (DBException e)
		{
			System.err.println(new Date().toString() + " DBException in SimplePlaylist:save: " +
e.toString());
			e.printStackTrace();
		}
	}

	public void save(DBConnection conn, int userID)
	{
		try
		{
			String sql = "exec sp_lcSavePlaylist_ixxd " + userID + ", ?";
```

```
60
                        DBPreparedStatement statement = conn.prepareStatement(sql);

                        byte[] b = toByteArray();

65                      statement.setBytes(1, toByteArray());

                        statement.executeUpdate();

                }
70              catch (DBException e)
                {
                        System.err.println(new Date().toString() + " DBException in SimplePlaylist:save:" +
    e.toString());
                }
75      }

        public static SimplePlaylist fromBytes(byte[] b)
        {
                if (b == null || b.length <= 0)
80                      return null;

                try
                {
                        ByteArrayInputStream bais = new ByteArrayInputStream(b);
85
                        if (bais == null)
                                return null;

                        ObjectInputStream ois = new ObjectInputStream(bais);
90
                        if (ois == null)
                                return null;

                        return (SimplePlaylist) ois.readObject();
95              }
                catch (Throwable e)
                {
                        System.err.println("Exception in SimplePlaylist:fromBytes:" + e.toString());
                }
100             return null;
        }

        public static SimplePlaylist load(DBConnection conn, int userID)
        {
105             String sql = "exec sp_lcGetPlaylist_xsxx " + userID;

                try
                {
                        DBResultSet rs = conn.executeSQL(sql);
110
                        return SimplePlaylist.fromBytes(rs.getBytes("playlist"));
                }
                catch (Throwable e)
                {
115                     System.err.println("Exception in SimplePlaylist:load:" + e.toString());
                }
                return null;
        }

120     private byte[] toByteArray()
```

```
        {
                try
        {
          ByteArrayOutputStream baos = new ByteArrayOutputStream();
125       ObjectOutputStream oos     = new ObjectOutputStream(baos);
          oos.writeObject(this);
          return baos.toByteArray();
        }
        catch (Throwable t)
130     {
                        System.err.println("toByteArray died: " + t.toString());
          t.printStackTrace();
          return null;
        }
135       }
}
```

Song

```
package com.launch.PlaylistGenerator;
public class Song
{
	public final static short EXCLUDED = 4;
	public final static short EXPLICIT = 3;
	public final static short IMPLICIT = 2;
	public final static short UNRATED  = 1;
	public final static short ANY      = 0;

	public int songID;
	public short type = ANY;
	private SongData data = null;

	public Song(int songID, short type)
	{
		this.songID = songID;
		setType(type);
	}

	public String toString()
	{
		return "Song " + songID
				+ ", type = "
				+ typeString()
				+ ", data = "
				+ ((data == null) ? "null" : data.toString());
	}

	public String typeString()
	{
		switch (type)
		{
			case ANY:
				return "ANY";
			case EXPLICIT:
				return "EXPLICIT";
			case IMPLICIT:
				return "IMPLICIT";
			case UNRATED:
				return "UNRATED";
			case EXCLUDED:
				return "EXCLUDED";
			default:
				return "UNKNOWN";
		}
	}

	// this should wait for setType
	public SongData getData()
	{
		return data;
	}

	// this should wait for setType
	public short getType()
	{
		return type;
	}
```

```
60
        // returns whether or not this is suitable for setting SongData
        public boolean setType(short newType)
        {
                short oldType = type;
65
                if (newType == type)
                        return true;
                else if (newType < type)
                        return false;
70              else
                        type = newType;

                // add or delete song data

75              if (newType == EXCLUDED)
                {
//                      if (oldType != 0)
//                              Util.debug(Thread.currentThread().getName() + ": deleting data for song " +
songID + ", oldType was " + oldType);
80                      data = null;
                }
                else if (oldType == ANY && (newType == EXPLICIT || newType == IMPLICIT || newType ==
UNRATED))
                {
85                      data = new SongData(songID);
                }

                return true;
        }
90  }
```

SongData

```
package com.launch.PlaylistGenerator;
public class SongData
{
    int songID;
    byte querySource;
    public AverageRating djsAverage;
    double score,
        netp,
        implicit,
        confidence,
        lastPlayed,
        bds,
        ratingF,
        djsF,
        netpF,
        commRatingF,
        lastPlayedF,
        bdsF;
    private SongInfo info;
    private Rating djs = new Rating((short) Constants.DEFAULT_DJS_SCORE);
    private byte djSource = SOURCE_DJS;
    public SongRating rating;
    PickStatus status;
    public final static byte SOURCE_RATED        = 1;
    public final static byte SOURCE_IMPLICIT_ALBUM  = 2;
    public final static byte SOURCE_IMPLICIT_ARTIST = 3;
    public final static byte SOURCE_IMPLICIT_SONG   = 4;
    public final static byte SOURCE_DJS          = 5;
    public final static byte SOURCE_DJS_SONG     = 5;
    public final static byte SOURCE_BDS          = 6;
    public final static byte SOURCE_POPULAR      = 7;
    public final static byte SOURCE_RANDOM       = 8;
    public final static byte SOURCE_NETP         = 9;
    public final static byte SOURCE_ALL          = 10;
    public final static byte SOURCE_RECENTLY_PLAYED = 11;
    public final static byte SOURCE_FORCED_POPULAR  = 12;
    public final static byte SOURCE_GENRES          = 13;
    public final static byte SOURCE_DJS_ALBUM       = 14;
    public final static byte SOURCE_DJS_ARTIST      = 15;
    public final static byte DO_NOTHING     = 0;
    public final static byte MAKE_ME_IMPLICIT = 1;
    public final static byte EXCLUDE_ME     = 2;
    public SongData(int songID)
    {
        lastPlayed  = Constants.DEFAULT_LASTPLAYED_SCORE;
        djsAverage  = new AverageRating((short) Constants.DEFAULT_DJS_SCORE);
        status      = new PickStatus();
        netp                = Constants.DEFAULT_NETP_SCORE;
        this.songID = songID;
        rating      = new SongRating();
    }
    public boolean equals(SongData otherData)
    {
        return (songID == otherData.songID);
    }
    public byte origin()
    {
        double maxValue = 0;
```

```
60                      byte maxSource  = SOURCE_RANDOM;
                byte ratingSource = 0;
                if (rating.isSet())
                        ratingSource = rating.getSource();
                        if (info.commRating > maxValue && info.commRating > Constants.POPULAR_THRESHOLD
65      && ratingSource != 1)
                        {
                                maxValue  = info.commRating;
                                maxSource = SOURCE_POPULAR;
                        }
70                      if (djs.isSet() && djs.get() >= maxValue && djs.get() > 0 && ratingSource != 1)
                        {
                                maxValue  = djs.get();
                                maxSource = djSource;
                        }
75                      /*
                        if (netP > maxValue)
                        {
                                maxValue = netP;
                                maxSource = SOURCE_NETP;
80                      }
                        */
                        if (bds > 0 && bds >= maxValue && ratingSource != 1)
                        {
                                maxValue  = bds;
85                              maxSource = SOURCE_BDS;
                        }
                        // according to the weight matrix, if there's an explicit rating,
                        //that's the only source
                        // but let's lie to people because they don't like it when we say
90                      // we played lowly-rated songs for them
                        // even though that's what we say we will play anyway
                        if (rating.isSet())
                        {
                                short value  = rating.get();
95                              if (value > Constants.MIN_RATING_FOR_RATED_SOURCE && value >=
        maxValue)
                                {
                                        maxValue  = value;
                                        maxSource = ratingSource;
100                             }
                        }
                        // lies, lies, lies.
                        if (maxValue < Constants.MIN_RATING_FOR_RATED_SOURCE)
                        {
105                             maxSource = SOURCE_RANDOM;
                        }
                        return maxSource;
                }
                public void calculateDJs(ItemsProfile items, AlbumArtistData albumAndArtist)
110             {
                        // put in the default
                        djs.set(djsAverage.get());
                        djSource = SOURCE_DJS_SONG;
                        if (djsAverage.count() <= 0)
115                     {
                                djSource = SOURCE_RANDOM;
                                Item albumItem = albumAndArtist.getAlbum(items, this);
                                Item artistItem = albumAndArtist.getArtist(items, this);
                                // don't calculate implicit ratings based on various artists
120                             if (artistItem != null && ArtistInfo.isVariousArtists(artistItem.itemID))
```

```
                        {
                                artistItem = null;
                        }
                        if (albumItem != null && albumItem.djsAverage.count() > 0)
125                     {
                                djs.set(albumItem.djsAverage.get());
                                djSource = SOURCE_DJS_ALBUM;
                        }
                        else if (artistItem != null && artistItem.djsAverage.count() > 0)
130                     {
                                djs.set(artistItem.djsAverage.get());
                                djSource = SOURCE_DJS_ARTIST;
                        }
                }
135     }
        public byte calculateImplicit(ItemsProfile items, AlbumArtistData albumAndArtist)
        {
                if (!rating.isSet())
                {
140                     Item albumItem = albumAndArtist.getAlbum(items, this);
                        Item artistItem = albumAndArtist.getArtist(items, this);
                        // don't calculate implicit ratings based on various artists
                        if (artistItem != null && ArtistInfo.isVariousArtists(artistItem.itemID))
                        {
145                             artistItem = null;
                        }
                        if (albumItem != null && albumItem.userRating.isSet())
                        {
                                short albumRating = albumItem.userRating.get();
150                             if (albumRating == 0)
                                        return EXCLUDE_ME;
                                else
                                {
                                        rating.set(albumRating,
155     SongRating.RATING_SOURCE_FROM_ALBUM);
                                        return MAKE_ME_IMPLICIT;
                                }
                        }
                        else if (artistItem != null && artistItem.userRating.isSet())
160                     {
                                short artistRating = artistItem.userRating.get();
                                if (artistRating == 0)
                                        return EXCLUDE_ME;
                                else
165                             {
                                        rating.set(artistRating,
    SongRating.RATING_SOURCE_FROM_ARTIST);
                                        return MAKE_ME_IMPLICIT;
                                }
170                     }
                        else if (artistItem != null && artistItem.songAverage.count() > 0)
                        {
                                rating.set((short) artistItem.songAverageScore(info.album.artist),
    SongRating.RATING_SOURCE_AVERAGE_SONG_RATING_BY_ARTIST);
175                             return MAKE_ME_IMPLICIT;
                        }
                }
                return DO_NOTHING;
        }
180     public void setBDS(short score)
        {
```

```
                bds = score;
        }
        public double getBDS()
185     {
                return bds;
        }
        public void score(WeightMatrix w, StationList stations)
        {
190             // score bds
                bds = info.bdsScore(stations);
                byte s = rating.getSource();
                /*
                // we're not using confidence right now. Take it out for speed
195             confidence = 0;
                if (ratingSource != SongRating.RATING_SOURCE_EXPLICIT)
                {
                        if (djs != DEFAULT_DJS_SCORE)
                                confidence += 10;
200                     if (netp > 0)
                                confidence += 10;
                        if (info.commRating > 0)
                                confidence += 10;
                }
205             */
                // implicit rating is based on ratings data
                ratingF    = (rating.get()   * w.matrix[s][WeightMatrix.RATING    ]);
                djsF       = (djs.get()      * w.matrix[s][WeightMatrix.DJS       ]);
                netpF      = (netp           * w.matrix[s][WeightMatrix.NETP      ]);
210             commRatingF = (info.commRating * w.matrix[s][WeightMatrix.COMM_RATING]);
                lastPlayedF = (lastPlayed     * w.matrix[s][WeightMatrix.LAST_PLAYED]);
                bdsF       = (bds            * w.matrix[s][WeightMatrix.BDS       ]);
                implicit   = ratingF + djsF + netpF + commRatingF;
                // score is based on other factors
215             score      = implicit + lastPlayedF + bdsF;
//              confidence += w.matrix[s][WeightMatrix.CONFIDENCE];
        }
        public void setInfo(SongInfo stuff)
        {
220             info = stuff;
        }
        public SongInfo getInfo()
        {
                return info;
225     }
        public boolean isInfoSet()
        {
                return (info != null);
        }
230     public int getArtistID()
        {
                return info.album.artist.ID;
        }
        public int getAlbumID()
235     {
                return info.album.ID;
        }
        public String getArtistName()
        {
240             return info.album.artist.title;
        }
        public String getAlbumName()
```

```
{
        return info.album.title;
}
public int getMediaID(short mediaType)
{
        return info.media.getID(mediaType);
}
public String getSongName()
{
        return info.title;
}
public String sourceString(byte source)
{
        switch (source) {
        case SOURCE_RECENTLY_PLAYED:
                return "recent";
        case SOURCE_RATED:
                return "rated";
        case SOURCE_IMPLICIT_ALBUM:
                return "album";
        case SOURCE_IMPLICIT_ARTIST:
                return "artist";
        case SOURCE_IMPLICIT_SONG:
                return "s avg";
        case SOURCE_DJS:
                return "djs";
        case SOURCE_DJS_ALBUM:
                return "djAlb";
        case SOURCE_DJS_ARTIST:
                return "djArt";
        case SOURCE_BDS:
                return "bds";
        case SOURCE_POPULAR:
                return "pop";
        case SOURCE_RANDOM:
                return "random";
        case SOURCE_NETP:
                return "netp";
        case SOURCE_GENRES:
                return "genres";
        case SOURCE_ALL:
                return "all";
        default:
                return "?";
        }
}
public static String originText(byte origin, String singularDJ, String posessiveDJ)
{
        switch (origin)
        {
                case SOURCE_RATED:
                        return (singularDJ + " rated this song");
                case SOURCE_IMPLICIT_ALBUM:
                        return (singularDJ + " rated this album");
                case SOURCE_IMPLICIT_ARTIST:
                        return (singularDJ + " rated this artist");
                case SOURCE_IMPLICIT_SONG:
                        return (singularDJ + " rated other songs by this artist");
                case SOURCE_DJS:
                        return (posessiveDJ + " DJs rated this song");
                case SOURCE_DJS_ALBUM:
```

```
                                return (posessiveDJ + " DJs rated this album");
                        case SOURCE_DJS_ARTIST:
                                return (posessiveDJ + " DJs rated this artist");
                        case SOURCE_BDS:
                                return (posessiveDJ + " radio stations play this song");
                        case SOURCE_POPULAR:
                                return "This song is popular on LAUNCHcast stations";
                        case SOURCE_RANDOM:
                                return "This song is a random pick";
                        case SOURCE_NETP:
                                return "Song recommendations";
                        case SOURCE_FORCED_POPULAR:
                                return "Popular - choose more genres for your music.";
                }
                return "";
        }
        public String toString()
        {
                return "songID:" + songID + ", "
                                + "score:" + score + ", "
                                + "implicit:" + implicit + ", "
                           + "confidence: " + confidence + ", "
                                + "lastPlayed:" + lastPlayed + ", "
                                + "rating:" + rating + ", "
                                + "ratingSource:" + rating.getSource() + ", "
                                + "bds:" + bds + ", "
                                + "djs:" + djs.get() + ", "
                                + "source:" + sourceString(querySource) + Util.newLine;
        }
        public PlaylistEntry toPlaylistEntry(short mediaType)
        {
                PlaylistEntry result = new PlaylistEntry();
                result.albumID      = getAlbumID();
                result.artistID     = getArtistID();
                result.albumTitle   = info.album.title;
                result.artistTitle  = info.album.artist.title;
                result.filepath     = info.media.getFilepath(mediaType);
                result.mediaID      = getMediaID(mediaType);
                result.songID       = songID;
                result.songTitle    = info.title;
                result.title        = info.title;
                return result;
        }

        public SimpleClip toSimpleClip(short mediaType)
        {
                return new SimpleClip(songID, getMediaID(mediaType), origin());
        }

        public String toDisplayString(int displayType, int count)
        {
                String delim  = "";
                String prefix = "";
                String suffix = "";
                String bgcolor = "";
                if (displayType == Util.DISPLAY_HTML)
                {
                        if (count % 2 == 0)
                                bgcolor = "#CCCCFF";
                        else
                                bgcolor = "white";
```

```
                        delim = "</FONT></TD><TD BGCOLOR=" + bgcolor + "><FONT SIZE=\"-2\">";
                        prefix = "<TR><TD BGCOLOR=" + bgcolor + "><FONT SIZE=\"-2\">";
                        suffix = "</FONT></TD></TR>";
                }
                else {
                        delim = "\t";
                }
                return (prefix + count
                        + delim + songID
                        + delim + sourceString(querySource)
                        + delim + sourceString(origin())
                        + delim + status.toDisplayString(displayType)
                        + delim + status.order
                        + delim + Util.fix(score, 2, 0)
                        + delim + Math.round(lastPlayed) + "/" + Math.round(lastPlayedF)
                        + delim + Math.round(bds)       + "/" + Math.round(bdsF)
                        + delim + Math.round(implicit)
                        + delim + Util.fix(rating.get(), 0, 2) + "/" + Util.fix(ratingF, 0, 2) + " (" +
rating.getSource() + ")"
                        + delim + Math.round(djs.get()) + "/" + Math.round(djsF)
                        + delim + Math.round(netp)      + "/" + Math.round(netpF)
                        + delim + Math.round(info.commRating)  + "/" + Math.round(commRatingF)
                        + delim + getAlbumID()
                        + delim + getArtistID()
                        + delim + getArtistName()
                        + delim + getSongName()
                        + delim + getAlbumName()
                        + delim + info.album.genresString()
                        + suffix
                );
        }
        public String originTclList()
        {
                return "{" + songID + " " + origin() + " " + Math.round(implicit) + "} ";
        }
        public static String[] namesArray()
        {
                String[] names = { "#",
                                                "songID",
                                                "query",
                                                "origin",
                                                "status",
                                                "ord",
                                                "score",
                                                "lastP.",
                                                "bds",
                                                "impl.",
                                                "rating(t)",
                                                "djs",
                                                "netP.",
                                                "comm",
                                                "albumID",
                                                "artistID",
                                                "artist",
                                                "title",
                                                "album",
                };
                return names;
        }
}
```

SongGroup

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class SongGroup extends Vector
{

        public SongData pickRandom(int factor)
        {
                int leftInList = size();
                if (leftInList <= 0)
                        return null;
                double rand         = Util.random(leftInList - 1) + 0.00001;
                int pickIndex       = (int) Math.round((Math.pow(rand, factor) / Math.pow(leftInList - 1,
factor)) * (leftInList - 1));
                SongData pick       = (SongData) elementAt(pickIndex);
                double pickDouble   = pickIndex;
                pick.status.percentile = (short) Math.round((pickDouble / size()) * 100);
                removeElementAt(pickIndex);
                return pick;
        }

}
```

SongInfo

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class SongInfo
{
	int songID;
	byte commRating = Constants.DEFAULT_COMMRATING;
	private boolean explicit = false;

	AlbumInfo album;
	String title;
	private Vector bdsRanks;
	public MediaList media;

	public SongInfo(int songID)
	{
		this.songID = songID;
		media = new MediaList();
	}

	public void addBDSRank(BDSRank rank)
	{
		if (bdsRanks == null)
			bdsRanks = new Vector(1, 1);

		bdsRanks.addElement(rank);
	}

	public int getArtistID() /* throws Exception */
	{

		return album.artist.ID;

		/*
		if (album == null)
		{
			throw new Exception("album is not set for SongInfo songID " + songID + "(" + title +
")");
		}

		return album.getArtistID();
		*/
	}

	public int getAlbumID() /* throws Exception */
	{
		/*
		if (album == null)
		{
			throw new Exception("album is not set for SongInfo songID " + songID + "(" + title +
")");
		}
		*/

		return album.ID;
	}


	public double bdsScore(StationList stations)
```

```
60          {
                if (bdsRanks == null || stations.size() <= 0)
                        return Constants.DEFAULT_BDS_SCORE;

                int i           = 0;
65              int pointBar    = Constants.BDS_SCORE_POINTBAR;
                float maxPoints = Constants.BDS_SCORE_MAX_POINTS;
                float totalpoints = 0;
                float numStations = 0;

70              BDSRank rank;
                Station sta;

                for (int j = 0; j < bdsRanks.size(); j++)
                {
75                      rank = (BDSRank) bdsRanks.elementAt(j);
                        sta  = stations.get(rank.stationID);

                        if (sta != null)
                        {
80                              totalpoints += (maxPoints - rank.rank);
                                numStations++;
                        }
                }

85              double potentialStations = stations.size();

                double score = ((((totalpoints / potentialStations) / maxPoints) + (numStations /
potentialStations) ) * 150.0);

90              return score;
            }

            public String bdsString()
            {
95              String result = "";

                if (bdsRanks == null)
                        return "(none)";

100             for (int i = 0; i < bdsRanks.size(); i++)
                {
                        result = result.concat(bdsRanks.elementAt(i).toString() + ",");
                }
                return "(" + result + ")";
105         }

            public String toString()
            {
                return "songID=" + songID + ", "
110                     + "title=" + title + ", "
                        + "commRating=" + commRating + ", "
                        + "media=" + media.toString()
                        + "bdsRanks=" + bdsString()
                        + "album=" + album.toString();
115         }

            public void setExplicitLyrics(boolean badStuff)
            {
                explicit = badStuff;
120         }
```

```
        public boolean hasExplicitLyrics()
        {
                return explicit;
125     }

}
```

SongInfoCache

```
package com.launch.PlaylistGenerator;
import java.util.Hashtable;
import java.util.Enumeration;
import javax.servlet.ServletOutputStream;
import java.util.Date;
import java.util.Vector;
public class SongInfoCache
{
        private Hashtable songs;
        private Hashtable albums;
        private Hashtable artists;
        private SongInfo songList[];
        private Hashtable ads;
        private Hashtable news;
        private Hashtable tips;
        private Clip adList[];
        private Clip newsList[];
        private Clip tipList[];
        private IntHash mediaTypes;
        public  PopularSongs popular;
        public  RatingsCache ratingsCache;
        private GenreIndex genres;
        public final static byte TYPE_SONG  = 1;
        public final static byte TYPE_ALBUM  = 2;
        public final static byte TYPE_ARTIST = 3;
        public final static byte TYPE_AD    = 4;
        public final static byte TYPE_NEWS  = 5;
        public final static byte TYPE_TIP   = 6;
        private ServletOutputStream out;
        public Date lastUpdate;
        public SongInfoCache(ServletOutputStream out)
        {
                // use memory most efficiently with load factor 1
                songs     = new Hashtable(50000);
                albums    = new Hashtable(3000);
                artists   = new Hashtable(1500);
                ads       = new Hashtable();
                news      = new Hashtable();
                tips      = new Hashtable();
                mediaTypes = new IntHash();
                genres    = new GenreIndex(100, 1);
                populate();
                lastUpdate = new Date();
        }
        public SongList getPopular(short mediaType)
        {
                return popular.get(mediaType);
        }
        public SongList getInGenres(GenreList myGenres)
        {
                return genres.getInGenreList(myGenres);
        }
        public SongList getInGenre(int genreID)
        {
                return genres.getInGenre(genreID);
        }
        public int countInGenres(GenreList myGenres)
        {
```

```
60                      return genres.countInGenreList(myGenres);
                }
                private void populate()
                {
                        try
65                      {
                                DBConnection conn = new DBConnection();
                                DBResultSet rs    = conn.executeSQL("exec sp_lcoGetSongDataCache_xsxx");
                                int songID, mediaType, rank, stationID, rowCount;
                                short genreID;
70                              String filePath;
                                SongInfo aSong;
                                ArtistInfo anArtist;
                                AlbumInfo anAlbum;
                                rowCount = 0;
75                              while (!rs.getBOF() && !rs.getEOF())
                                {
                                        songID    = rs.getInt("songID");
                                        mediaType  = rs.getInt("mediaType");
                                        aSong = (SongInfo) init(songID, SongInfoCache.TYPE_SONG);
80                                      filePath = rs.getString("server") + rs.getString("directory") + "\\" +
rs.getString("filePath");
                                        aSong.media.add((short) mediaType, rs.getInt("mediaID"), filePath);
                                        aSong.title = rs.getString("song");
                                        anArtist = (ArtistInfo) init(rs.getInt("artistID"),
85 SongInfoCache.TYPE_ARTIST);
                                        anArtist.title = rs.getString("artist");
                                        anArtist.songs.put(new Integer(songID), aSong);
                                        anAlbum = (AlbumInfo) init(rs.getInt("albumID"),
SongInfoCache.TYPE_ALBUM);
90                                      anAlbum.title = rs.getString("album");
                                        aSong.setExplicitLyrics(rs.getInt("explicit") == 1);
                                        // add year and date added
                                        anAlbum.artist = anArtist;
                                        aSong.album = anAlbum;
95                                      mediaTypes.increment(mediaType);
                                        rowCount++;
                                        rs.next();
                                }
                                Util.debug("SongInfoCache:populate loaded " + rowCount + " media");
100                             rs = conn.executeSQL("exec sp_lcoGetCommRatingCache_xsxx");
                                rowCount = 0;
                                while (!rs.getBOF() && !rs.getEOF())
                                {
                                        songID = rs.getInt("songID");
105                                     aSong = (SongInfo) get(songID, SongInfoCache.TYPE_SONG);

                                        if (aSong != null)
                                        {
                                                aSong.commRating = (byte) rs.getInt("commRating");
110                                             rowCount++;
                                        }
                                        rs.next();
                                }
                                Util.debug("SongInfoCache:populate loaded " + rowCount + " commRatings");
115                             rs = conn.executeSQL("exec sp_lcoGetGenreCache_xsxx");
                                while (!rs.getBOF() && !rs.getEOF())
                                {
                                        genreID = (short) rs.getInt("genreID");
                                        songID = rs.getInt("songID");
120                                     aSong = (SongInfo) get(songID, SongInfoCache.TYPE_SONG);
```

```
                        if (aSong != null && aSong.album != null)
                        {
                                aSong.album.addGenre(genreID);
                                genres.add(genreID, aSong);
125                             rowCount++;
                        }
                        rs.next();
                }
                Util.debug("SongInfoCache:populate loaded " + rowCount + " genre mappings");
130             rowCount = 0;
                rs = conn.executeSQL("exec sp_lcoGetBDSCache_xsxx");
                while (!rs.getBOF() && !rs.getEOF())
                {
                        songID = rs.getInt("songID");
135                     aSong = (SongInfo) get(songID, TYPE_SONG);
                        if (aSong != null)
                        {
                                rank    = rs.getInt("rank");
                                stationID = rs.getInt("stationID");
140                             rowCount++;
                                aSong.addBDSRank(new BDSRank((short) stationID, (byte) rank));
                        }
                        rs.next();
                }
145             Util.debug("SongInfoCache:populate loaded " + rowCount + " bds Ranks");
                // import ads
                rowCount = 0;
                rs = conn.executeSQL("exec sp_lcoGetAdCache_xsxx");
                Clip ad;
150             int clipID;

                while (!rs.getBOF() && !rs.getEOF())
                {
                        clipID = rs.getInt("clipID");
155     //              filePath = rs.getString("server") + rs.getString("directory") + "/" +
    rs.getString("filePath");

                        ad    = (Clip) init(clipID, TYPE_AD);
    //                  ad.name   = rs.getString("clipName");
                        ad.media.add((short) rs.getInt("mediaType"), rs.getInt("mediaID"), null);
160                     rowCount++;
                        rs.next();
                }
                Util.debug("SongInfoCache:populate loaded " + rowCount + " ad media");
                // import news
165             rs = conn.executeSQL("exec sp_lcoGetNewsCache_xsxx");
                rowCount = 0;
                Clip newsbit;
                while (!rs.getBOF() && !rs.getEOF())
                {
170                     clipID = rs.getInt("clipID");
                        filePath = rs.getString("server") + rs.getString("directory") + "\\" +
    rs.getString("filePath");

                        newsbit    = (Clip) init(clipID, TYPE_NEWS);
                        newsbit.name   = rs.getString("clipName");
175                     newsbit.media.add((short) rs.getInt("mediaType"), rs.getInt("mediaID"),
    filePath);

                        rowCount++;
                        rs.next();
                }
180             Util.debug("SongInfoCache:populate loaded " + rowCount + " news media");
                // import tips
```

```
                        rs = conn.executeSQL("exec sp_lcoGetTipCache_xsxx");
                        rowCount = 0;
                        Clip tip;
185                     while (!rs.getBOF() && !rs.getEOF())
                        {
                                clipID = rs.getInt("clipID");
                                filePath = rs.getString("server") + rs.getString("directory") + "\\" +
rs.getString("filePath");
190                             tip    = (Clip) init(clipID, TYPE_TIP);
                                tip.name   = rs.getString("clipName");
                                tip.media.add((short) rs.getInt("mediaType"), rs.getInt("mediaID"), filePath);
                                rowCount++;
                                rs.next();
195                     }
                        Util.debug("SongInfoCache:populate loaded " + rowCount + " tip media");
                        conn.close();
                }
                catch (DBException oops)
200             {
                        System.out.println("DBException in cache populate: " + oops.getMessage());
                }
                // populate the songs array
                songList = new SongInfo[songs.size()];
205             int i = 0;
                for (Enumeration e = songs.keys(); e.hasMoreElements() ;) {
                        songList[i] = (SongInfo) songs.get((Integer) e.nextElement());
                        i++;
                }
210             // populate the ads array
                adList = new Clip[ads.size()];
                i = 0;
                for (Enumeration e = ads.keys(); e.hasMoreElements() ;) {
                        adList[i] = (Clip) ads.get((Integer) e.nextElement());
215                     i++;
                }
                // populate the news array
                newsList = new Clip[news.size()];
                i = 0;
220             for (Enumeration e = news.keys(); e.hasMoreElements() ;) {
                        newsList[i] = (Clip) news.get((Integer) e.nextElement());
                        i++;
                }
                // populate the tips array
225             tipList = new Clip[tips.size()];
                i = 0;
                for (Enumeration e = tips.keys(); e.hasMoreElements() ;) {
                        tipList[i] = (Clip) tips.get((Integer) e.nextElement());
                        i++;
230             }
                // make popular lists
                popular = new PopularSongs(songs, mediaTypes);
                Util.debug("SongInfoCache:populate done");
        }
235     private Hashtable getHash(byte type)
        {
                if (type == TYPE_SONG)
                        return songs;
                else if (type == TYPE_ALBUM)
240                     return albums;
                else if (type == TYPE_ARTIST)
                        return artists;
```

```
                else if (type == TYPE_AD)
                        return ads;
                else if (type == TYPE_NEWS)
                        return news;
                else if (type == TYPE_TIP)
                        return tips;
                return null;
        }
        public Object init(int ID, byte type)
        {
                if (getHash(type).containsKey(new Integer(ID)))
                {
                        return get(ID, type);
                }
                else {
                        return put(ID, type);
                }
        }
        public Object get(Integer ID, byte type)
        {
                return (getHash(type)).get(ID);
        }
        public Object get(int ID, byte type)
        {
                return get(new Integer(ID), type);
        }
        private Object makeNew(int ID, byte type)
        {
                if (type == TYPE_SONG)
                        return new SongInfo(ID);
                else if (type == TYPE_ALBUM)
                        return new AlbumInfo(ID);
                else if (type == TYPE_ARTIST)
                        return new ArtistInfo(ID);
                else if (type == TYPE_AD)
                        return new Clip(ID, Clip.TYPE_AD);
                else if (type == TYPE_NEWS)
                        return new Clip(ID, Clip.TYPE_NEWS);
                else if (type == TYPE_TIP)
                        return new Clip(ID, Clip.TYPE_TIP);
                return null;
        }
        private Object put(int ID, byte type)
        {
                Hashtable hash = getHash(type);
                Object thing = makeNew(ID, type);
                hash.put(new Integer(ID), thing);
                return thing;
        }
        public SongInfo randomSong()
        {
                long index = Util.random(songList.length - 1);
                if (index > songList.length - 1)
                        return null;
                return songList[(int) index];
        }
        public Enumeration keys(byte type)
        {
                if (type == TYPE_SONG)
                        return songs.keys();
                else if (type == TYPE_ALBUM)
```

```
                return albums.keys();
        else if (type == TYPE_ARTIST)
                return artists.keys();
        else if (type == TYPE_AD)
                return ads.keys();
        else if (type == TYPE_NEWS)
                return news.keys();
        else if (type == TYPE_TIP)
                return tips.keys();
        return null;
}
public int size(byte type)
{
        Hashtable hash = getHash(type);
        if (hash != null)
                return hash.size();
        return 0;
}
private Clip[] getClipList(byte type)
{
        if (type == TYPE_AD)
                return adList;
        else if (type == TYPE_NEWS)
                return newsList;
        else if (type == TYPE_TIP)
                return tipList;
        return null;
}
public Clip randomClip(byte type)
{
        Clip[] clips = getClipList(type);
        if (clips == null || clips.length <= 0)
                return null;
        return clips[(int) Util.random(clips.length - 1)];
}
public Vector randomClipList(byte type, short mediaType, int max)
{
        Vector list = new Vector();
        Clip bip;
        // stop if we have enough or we've iterated too many times
        for (int i = 0; i < (max * 10) && list.size() < max; i++)
        {
                int iterations = max;
                boolean cool = false;
                boolean done = false;
                do
                {
                        bip = randomClip(type);
                        iterations--;
                        // maybe we didn't get one
                        if (bip == null)
                        {
                                done = true;
                        }
                        else
                        {
                                // we got one that fits!
                                cool = (bip.media.inType(mediaType) && !list.contains(bip));
                                // we've got to stop sometime
                                done = (cool || iterations < 0);
                        }
```

```
365                             }
                                while (!done);
                                // if it was cool, go ahead
                                if (cool)
                                        list.addElement(bip);
370                     }
                        return list;
                }
        }
```

SongInfoCacheUpdater

```
package com.launch.PlaylistGenerator;
import javax.servlet.http.HttpServlet;
import java.util.Date;
public class SongInfoCacheUpdater extends Thread
{
	PlaylistGeneratorServlet servlet;

	public SongInfoCacheUpdater(PlaylistGeneratorServlet servlet)
	{
		this.servlet = servlet;
	}
	public void run()
	{
		Thread.currentThread().setName("SongInfoCacheUpdater");

		// update every day
		long timeToSleep = Util.MILLISECONDS_IN_SECOND *
					Util.SECONDS_IN_MINUTE	*
					Util.MINUTES_IN_HOUR	*
					Util.HOURS_IN_DAY;

		while (true)
		{

			try { Thread.sleep(timeToSleep); } catch (InterruptedException e) {};

			try
			{

				Util.debug("updating song cache at " + new Date());
				Util.debug("last update was at " + servlet.songCache.lastUpdate);

				// make a new cache
				SongInfoCache cache = new SongInfoCache(null);

				// make sure to copy over the ratingsCache too!!!
				cache.ratingsCache = servlet.songCache.ratingsCache;

				// install the new cache
				servlet.songCache = cache;
				Util.debug("finished updating song cache at " + new Date());
				Util.debug("last update is now at " + servlet.songCache.lastUpdate);
			}
			catch (Throwable e)
			{
				System.err.println("SongInfoCacheUpdater caught an exception: " +
e.toString());
				e.printStackTrace();
			}

		}
	}
}
```

SongList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
import java.util.Hashtable;
import java.util.Enumeration;
public class SongList implements Cloneable
{
	private Vector	list = new Vector();
	private Hashtable unique = new Hashtable();
	private boolean ordered  = false;
	public SongList()
	{
	}
	/**
	 * Creates a SongList from a Hashtable of songs
	 */
	public SongList(Hashtable songs)
	{
		SongInfo info = null;
		Integer songID;
		for (Enumeration e = songs.keys(); e.hasMoreElements();)
		{
			songID = (Integer) e.nextElement();
			info = (SongInfo) songs.get(songID);
			addElement(info);
		}
	}
	public SongList(Hashtable songs, short mediaType)
	{
		Integer songID;
		SongInfo info = null;
		for (Enumeration e = songs.keys(); e.hasMoreElements();)
		{
			songID = (Integer) e.nextElement();
			info = (SongInfo) songs.get(songID);
			if (info.media.inType(mediaType))
			{
				addElement(info);
			}
		}
	}
	public void addElement(SongInfo info)
	{
		Integer ID = new Integer(info.songID);
		// check unique constraint
		if (unique.get(ID) == null)
		{
			list.addElement(info);
			unique.put(ID, info);
		}
	}
	public void addElements(SongList list)
	{
		if (list == null)
			return;
		for (int i = 0; i < list.size(); i++)
		{
			addElement(list.elementAt(i));
		}
```

```
60          }
            public void sort()
            {
                    sort(this, 0, list.size() - 1);
                    ordered = true;
65          }
            public int size()
            {
                    return list.size();
            }
70          public SongInfo elementAt(int index)
            {
                    return (SongInfo) list.elementAt(index);
            }
            public void setSize(int newSize)
75          {
                    list.setSize(newSize);
            }
            private void sort(SongList a, int from, int to)
            {
80
                    // quicksort
                    // If there is nothing to sort, return
                    if ((a == null) || (a.size() < 2)) return;
                    int i = from, j = to;
85                  SongInfo center = a.elementAt((from + to) / 2);

                    do {
                            while((i < to) && (center.commRating < a.elementAt(i).commRating)) i++;
                            while((j > from) && (center.commRating > a.elementAt(j).commRating)) j--;
90                          if (i < j) {
                                    SongInfo temp = a.elementAt(i);
                                    a.setElementAt(a.elementAt(j), i);
                                    a.setElementAt(temp, j);   // swap elements
                            }
95                          if (i <= j) { i++; j--; }
                    } while(i <= j);
                    if (from < j) sort(a, from, j); // recursively sort the rest
                    if (i < to) sort(a, i, to);
            }
100         public void setElementAt(SongInfo info, int index)
            {
                    list.setElementAt(info, index);
            }
            public SongInfo pickRandom()
105         {
                    if (size() <= 0)
                            return null;
                    int lucky = (int) Util.random(size() - 1);
                    if (lucky < 0)
110                         return null;
                    SongInfo info = elementAt(lucky);
                    list.removeElementAt(lucky);
                    return info;
            }
115         public Object clone()
            {
                    SongList result = new SongList();
                    result.ordered  = this.ordered;
                    result.unique   = (Hashtable) unique.clone();
120                 result.list     = (Vector) list.clone();
```

```
            return result;
        }
}
```

SongRating

```
package com.launch.PlaylistGenerator;
public class SongRating
{

        public final static byte RATING_SOURCE_NONE       = 0;
        public final static byte RATING_SOURCE_EXPLICIT   = 1;
        public final static byte RATING_SOURCE_FROM_ALBUM  = 2;
        public final static byte RATING_SOURCE_FROM_ARTIST = 3;
        public final static byte RATING_SOURCE_AVERAGE_SONG_RATING_BY_ARTIST = 4;

        private short rating = (short) Constants.DEFAULT_RATING;
        private boolean set = false;
        private byte type;

        public boolean isSet()
        {
                return set;
        }

        public short set(short newRating, byte newType)
        {

                rating = newRating;
                type = newType;
                set = true;

                return rating;
        }

        public short get()
        {
                return rating;
        }

        public byte getSource()
        {
                return type;
        }
}
```

Station

```
package com.launch.PlaylistGenerator;
public class Station
{
        int ID;

        public Station(int stationID)
        {
                ID = stationID;
        }
}
```

StationList

```
package com.launch.PlaylistGenerator;
import java.util.Vector;
public class StationList
{

        private Vector slist;

        public StationList()
        {
                slist = new Vector();
        }

        public Station stationAt(int i)
        {
                return (Station) slist.elementAt(i);
        }

        public void addElement(Station s)
        {
                slist.addElement(s);
        }

        public int size()
        {
                return slist.size();
        }

        public String inList()
        {
                Integer list[] = new Integer[size()];

                int last = 0;

                for (int i = 0; i < slist.size(); i++)
                {
                        list[i] = new Integer(stationAt(i).ID);
                }

                return Util.join(", ", list);
        }
        public Station get(int stationID)
        {
                for (int i = 0; i < slist.size(); i++)
                {
                        if (stationAt(i).ID == stationID)
                        {
                                return stationAt(i);
                        }
                }
                return null;
        }
}
```

Util

```
package com.launch.PlaylistGenerator;
import java.io.OutputStream;
import java.util.Date;
import javax.servlet.ServletOutputStream;
import java.io.IOException;
public class Util
{
	public static final int MILLISECONDS_IN_SECOND = 1000;
	public static final int SECONDS_IN_MINUTE	= 60;
	public static final int MINUTES_IN_HOUR	= 60;
	public static final int HOURS_IN_DAY	= 24;
	public static final int DAYS_IN_WEEK	= 7;
	public static final int DAYS_IN_MONTH	= 30;
	public static final int DISPLAY_TEXT = 0;
	public static final int DISPLAY_HTML = 1;
	public static final String newLine = "\r\n";
	public static final short average(double count, double sum)
	{
		if (count == 0)
			return 0;
		return (short) Math.round(sum / count);
	}
	public static final long random(int ceiling)
	{
		return Math.round(Math.random() * ceiling);
	}
	public static final String join (String delim, Object values[])
	{
		String result = "";
		int i = 0;
		for (; i < values.length; i++)
			result = result.concat(values[i].toString() + delim);
		if (i > 0)
			result = result.substring(0, (result.length() - delim.length()));
		return result;
	}
	public static final String fix(double number, int precision, int zeroFill)
	{
		double power = Math.pow(10, precision);
		double fixed = Math.round(number * power) / power;
		String mantissa = new Long(Math.round(fixed)).toString();
		String result = mantissa;
		for (int i = mantissa.length(); i < zeroFill; i++)
			result = new String("0" + result);
		return result;
	}
	public static final void out(ServletOutputStream stream, String whatever)
	{
		try
		{
			if (stream == null)
				System.out.println(whatever);
			else
				stream.println(whatever);
		}
		catch (IOException e)
		{
		}
```

```
60              }
                public static final void debug(String info)
                {
                        System.out.println(info);
                }
65              public final static String tab(int times)
                {
                        String result = "";
                        for (int i = 0; i < times; i++)
                        {
70                              result = result.concat("    ");
                        }
                        return result;
                }
                public static final void markQueryFinished(String threadName, Date startDate)
75              {
                        Util.debug(newLine + threadName + " started getting data after "
                                        + ((new Date().getTime() - startDate.getTime()) / 1000.0)
                                        + " seconds" + newLine);
                }
80              public static final void printElapsedTime(String threadName, Date startDate)
                {
                        Util.debug(newLine + new Date().toString() + " " + threadName + " took "
                                        + ((new Date().getTime() - startDate.getTime()) / 1000.0)
                                        + " seconds" + newLine);
85              }
                public static final String tab()
                {
                        return tab(1);
                }
90      }
```

WeightMatrix

```
package com.launch.PlaylistGenerator;
public class WeightMatrix
{
        public final static byte RATING     = 0;
        public final static byte DJS        = 1;
        public final static byte NETP       = 2;
        public final static byte COMM_RATING = 3;
        public final static byte LAST_PLAYED = 4;
        public final static byte BDS        = 5;
        public final static byte CONFIDENCE  = 6;
        // rating, djs, netp, commRating, lastPlayed, bds, conf
        public double matrix[][] = {
                                                {0.00, 0.33, 0.00, 0.10, 0.25, 0.20, 0.0},   // no rating
                                                {0.70, 0.00, 0.00, 0.00, 0.30, 0.00, 100.0}, // explicit rating
                                                {0.45, 0.05, 0.00, 0.05, 0.20, 0.20, 50.0},  // album rating
only
                                                {0.40, 0.10, 0.00, 0.05, 0.20, 0.20, 30.0},  // artist only
                                                {0.35, 0.15, 0.00, 0.05, 0.20, 0.20, 20.0}   // cross-propagated
song ratings
                                                };
}
```

WeightMatrix.java Page 1 of 1 11/05/99 1:32 PM