

CLAIMS

What is claimed is:

5

1. A computer-implemented data processing system ~~(100)~~, comprising:
 - a table comprising rows, and columns that indicate an identifier, name, outline level, view position, data position, and descendant count, the table in part defines a hierarchical dataset of an entire recordset;
 - a position converter index comprising an ordered index of the rows used to track an expanded/collapsed state of the table and to translate between a view position and a data position of the hierarchical dataset;
 - a collapsed set list comprising a list of collapsed rows, configured to indicate whether a respective row of the hierarchical dataset is to be collapsed or expanded;
 - a paging component ~~(102) for paging a hierarchical dataset based on~~ configured to page the table, the position converter, and the set list to obtain relevant rows to a row operation on one or more rows of a client viewset, thereby reducing an amount of processed data to the relevant rows, wherein paging comprises obtaining a subset of rows through viewing operations including sorting, filtering, or grouping, and wherein the client viewset represents what a user can physically see on a client at a given moment; ~~and~~
 - an update component ~~(112) for updating~~ configured to update the client viewset to include the relevant rows in response to a row change operation comprising a row operation of an editing nature, the update to the client viewset based on row keys associated with the paged ~~hierarchical dataset table;~~ and
 - a processor that executes computer-executable instructions associated with at least one of the table, the position converter index, the collapsed set list, the paging component, or the update component.
2. The system of claim 1, wherein the paging component manages a parent-child relationship of rows in the client viewset, the rows are relevant to the row operation.

3. The system of claim 1, wherein the paging component creates a hierarchy structure index defined by an ordered mapping of row keys and parent keys, the index sent to a client in response to the row operation of the client viewset.

4. The system of claim 1, wherein the row operation is a read operation that collapses rows of the hierarchical view into a collapsed row, expands a collapsed row to show one or more new rows in the hierarchical view, and adds or removes rows based on scrolling of the client viewset.

5. The system of claim 1, wherein the row operation is an edit operation associated with insert of a row, delete of a row, indent of a row, or outdent of a row in the client viewset.

6. The system of claim 1, wherein the paging component pages the hierarchical dataset for rows relevant to the row operation based on filtering, sorting, row expansion, and row collapse.

7. The system of claim 1, wherein the update component updates an unfiltered hierarchy based on row operations associated with an edit mode.

5

8. The system of claim 1, wherein the paging component pages the hierarchical dataset asynchronously based on the row change operation.

9. A [computer-readable storage memory comprising computer-executable instructions that when executed by a processor enables a ~~computer-implemented~~ data processing system-\(200\)](#), comprising:

[a table comprising rows, and columns that indicate an identifier, name, outline level, view position, data position, and descendant count;](#)

[datasets associated with the table, the datasets comprising a position converter index and a collapsed set list, wherein the position converter index is an ordered index of the rows that is used to track an expanded/collapsed state of the table and to translate between a view position and a data position, and wherein the collapsed set list is a list of collapsed rows, to indicate whether a respective row will be collapsed or expanded;](#)

a paging component ~~(102)~~ of a server configured to obtain a subset of relevant rows of the table ~~for obtaining a page of a hierarchical dataset~~ in response to a row operation for obtaining relevant data to be rendered in a client viewset of a client, where the client viewset comprises a set of rows visible on a screen of the client without scrolling; and

an update component ~~(112)~~ of the server configured to update ~~for updating~~ the client viewset to include the relevant rows according to a row change operation comprising a row operation of an editing nature, the subset ~~page~~ including only rows relevant to the row change operation.

10. The computer-readable storage memory ~~system~~ of claim 9, wherein the paging component manages parent-child relationships of rows in the client viewset.

11. The computer-readable storage memory ~~system~~ of claim 9, wherein the paging component creates a hierarchy structure index defined by an ordered mapping of row keys and parent keys, and sends the index to a client with the updated client viewset based on an editing row operation.

12. The computer-readable storage memory ~~system~~ of claim 9, wherein the row operation is a read operation, the read operation associated with collapsing rows of the client viewset into a collapsed row, expanding a row to show one or more new rows in the client viewset, or adding and removing rows based on scrolling of the client viewset.

13. The computer-readable storage memory ~~system~~ of claim 9, wherein the row operation is an edit operation associated with insert of a row, delete of a row, indent of a row, or outdent of a row in the client viewset.

14. A computer-implemented method of processing data, comprising acts of:
providing a table that defines a hierarchical dataset of an entire recordset,
the table comprising rows, and columns that indicate an identifier, name, outline level,
view position, data position, and descendant count of the hierarchical dataset;
providing datasets associated with the table, the datasets comprising a
position converter index and a collapsed set list, wherein the position converter index is an
ordered index of the rows that is used to track an expanded/collapsed state of the table and
to translate between a view position and a data position, and wherein the collapsed set list
is a list of collapsed rows, to indicate whether a respective row is to be collapsed or
expanded;
receiving a request from a client for relevant data to be rendered in a client
viewset based on a client row operation, where the client viewset comprises a set of rows
visible on a screen of the client without scrolling ~~(500)~~;
obtaining a subset of relevant rows of the table ~~page of a hierarchical~~
~~dataset~~ for the relevant data in response to the request by performing viewing operations
including sorting, filtering, or grouping ~~(502)~~; ~~and~~
sending the relevant rows ~~data~~ to the client for update of the client viewset
~~(504)~~; ~~and~~
utilizing a processor that executes instructions stored in memory to perform
at least one of the acts of receiving, obtaining, or sending.

15. The method of claim 14, further comprising managing parent-child
relationships based on the row operation.

16. The method of claim 14, further comprising paging the table ~~hierarchical~~
~~dataset~~ in response to a read operation that collapses rows of the client viewset into a
collapsed row, expands a collapsed row to show one or more child rows in the client
viewset, and shows/hides rows based on scrolling of the client viewset.

17. The method of claim 14, further comprising obtaining a subset ~~page~~ of the
hierarchical dataset as represented by the table and the datasets, in response to an edit
operation associated with insert of a row, delete of a row, indent of a row, or outdent of a
row in the client viewset.

18. The method of claim 14, further comprising applying one or more of filtering, sorting, or grouping to receive the relevant data.

19. The method of claim 14, further comprising creating an unfiltered hierarchy structure that defines the relevant data related to row parentage, row outline level, child rows, and indent/outdent operations.

20. The method of claim 14, wherein the [subset](#) ~~page~~ of the hierarchical dataset [as represented by the table](#) is obtained asynchronously based on the request.