

2020 to December 31, 2020, that the parallel number is 4, and that the nonoperating days are Saturdays and Sundays.

[0031] In step S21, $\text{Ceiling}(365 \text{ days}/4) = 92 \text{ days}$ is calculated as the reference number of days because the simulation period is 365 days and because the parallel number is 4. Herein, Ceiling function is a function of roundup of digits after the decimal point. In step S22, 1 is set as the variable i and January 1, 2020 is set as the variable si .

In step S23, the processing is advanced to step S24 because January 1, 2020 set as the variable si is Wednesday and an operating day. In step S24, December 29, 2019 that is the first nonoperating day preceding January 1, 2020 is set as the starting day of the first split period. In addition, December 29, 2019 is set as the variable si .

In step S25, the variable i is 1 and thus April 2, 2020 that is 92 days after January 1, 2020 being the starting day of the simulation period is set as the variable ei . In step S26, April 3, 2020 that is the day before April 4, 2020 being the first nonoperating day on or after April 2, 2020 is set as the ending day of the first split period.

In step S27, the processing is advanced to step S29 because April 3, 2020 is not a day on or after the ending day of the simulation period. In step S29, April 4, 2020 is set as the starting day of the second split period. In addition, April 4, 2020 is set as the variable si . Then the variable i is changed into 2 and the processing is thereafter returned to step S25.

[0032] In step S25, July 5, 2020 that is 92 days after April 4, 2020 set as the variable si is set as the variable ei . In step S26, July 4, 2020 that is the day before July 5, 2020 being the first nonoperating day on or after July 5, 2020 is set as the ending day of the second split period.

In step S27, the processing is advanced to step S29 because July 4, 2020 is not

Array) can be assumed.

The functional components may be implemented by one electronic circuit 15 or the functional components may be dispersively implemented by a plurality of electronic circuits 15.

5 [0053] <Modification 6>

In Modification 6, some of the functional components may be implemented by hardware and the other functional components may be implemented by software.

[0054] The processor 11, the memory 12, the storage 13, and the electronic circuit 15 are referred to as a processing circuit. That is, the functions of the functional
10 components are implemented by the processing circuit.

[0055] Embodiment 2.

Embodiment 2 differs from Embodiment 1 in that initial values of the quantities of state concerning the thermal environment are provided for each split period. As for Embodiment 2, these differences will be described and description of
15 identical points is omitted.

[0056] *** Description of configuration ***

With reference to Fig. 10, a configuration of the simulation device 10 according to Embodiment 2 will be described.

The simulation device 10 differs from the simulation device 10 illustrated in
20 Fig. 21 in that an initialization unit 27 is included as a functional component.

[0057] *** Description of operation ***

With reference to Fig. 11, general processing by the simulation device 10 according to Embodiment 2 will be described.

Processes of step S51 to step S53 are the same as the processes of step S11 to
25 step S13 in Fig. 2. In addition, processes of step S55 to step S57 are the same as the

Claims

[Claim 1] A simulation device comprising:

an acquisition unit to acquire a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

a planning unit to set the number of days, resulting from division of the number of days of the simulation period by the parallel number with roundup of digits after decimal point, as a reference number of days, and split the simulation period, acquired by the acquisition unit, into the parallel number so as to generate split periods,
~~the planning unit splitting the simulation period into the parallel number so that~~
numbers of days of the split periods approximate the reference number of days and so
 that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

a simulation unit to do the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting by the planning unit.

~~[Claim 2] — The simulation device according to claim 1, wherein—~~

~~the planning unit sets the number of days, resulting from division of the number of days of the simulation period by the parallel number with roundup of digits after decimal point, as a reference number of days and splits the simulation period into the parallel number so that numbers of days of the split periods approximate the reference number of days and so that the starting days of the split periods other than the initial split period in the simulation period are the nonoperating days indicated by the—~~

~~holiday condition.~~

[Claim 32] ~~The A~~ simulation device ~~according to claim 1 or 2, comprising:~~

an acquisition unit to acquire a simulation period indicating an object period
for which simulations of amounts of energy consumption in a building are to be done, a
 5 parallel number indicating the number of the simulations that are to be performed in
parallel, and a holiday condition indicating nonoperating days of an air conditioning
system installed in the building;

a planning unit to split the simulation period, acquired by the acquisition unit,
into the parallel number so as to generate split periods so that starting days of the split
 10 periods other than an initial split period in the simulation period are the nonoperating
days indicated by the holiday condition; and

a simulation unit to do the simulations of the amounts of energy consumption
in the building in parallel, for the split periods generated by splitting by the planning
unit, wherein

15 the planning unit

sets the number of days, resulting from the division of the number of
 days of the simulation period by the parallel number with the roundup of digits after
 decimal point, as a reference number of days, sets a day before a first nonoperating day
 on or after a day that is the reference number of days after a starting day of the
 20 simulation period, as an ending day of a first split period, and sets the first nonoperating
 day as a starting day of a second split period, and

sets a day before an i-th nonoperating day that is a first nonoperating
 day on or after a day which is the reference number of days after a starting day of an i-th
 split period, as an ending day of the i-th split period, and sets the i-th nonoperating day
 25 as a starting day of an i+1-th split period, sequentially from $i = 2$ to $n-1$, where n is the

parallel number.

[Claim 43] ~~The A~~ simulation device according to claim 1 or 2, comprising:

an acquisition unit to acquire a simulation period indicating an object period
for which simulations of amounts of energy consumption in a building are to be done, a
 5 parallel number indicating the number of the simulations that are to be performed in
parallel, and a holiday condition indicating nonoperating days of an air conditioning
system installed in the building;

a planning unit to split the simulation period, acquired by the acquisition unit,
into the parallel number so as to generate split periods so that starting days of the split
 10 periods other than an initial split period in the simulation period are the nonoperating
days indicated by the holiday condition; and

a simulation unit to do the simulations of the amounts of energy consumption
in the building in parallel, for the split periods generated by splitting by the planning
unit, wherein

15 the planning unit sets the number of days, resulting from the division of the
 number of days of the simulation period by the parallel number with the roundup of
 digits after decimal point, as a reference number of days, sets a day before an i-th
 nonoperating day that is a first nonoperating day on or after a day which is the reference
 number of days multiplied by i after a starting day of the simulation period, as an ending
 20 day of an i-th split period, and sets the i-th nonoperating day as a starting day of an i+1-
 th split period, sequentially from i = 1 to n-1, where n is the parallel number.

[Claim 74] ~~The A~~ simulation device according to any one of claims 1 to 6,
~~further~~ comprising:

an acquisition unit to acquire a simulation period indicating an object period
 25 for which simulations of amounts of energy consumption in a building are to be done, a

parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

a condition determination unit to determine whether an amount of heat exchange between room interior of the building and outdoors on a nonoperating day indicated by the holiday condition, acquired by the acquisition unit, exceeds a reference value or not, ~~wherein;~~

~~in case where the condition determination unit determines that the amount of the heat exchange exceeds the reference value, the~~ a planning unit to, in case where the condition determination unit has determined that the amount of the heat exchange exceeds the reference value, splits the simulation period, acquired by the acquisition unit, into the parallel number so as to generate split periods so that ~~the~~ starting days of the split periods other than ~~the~~ an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

a simulation unit to do the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting by the planning unit.

[Claim 8] ~~———— The simulation device according to any one of claims 1 to 7, wherein ———— the simulation unit sets each of the split periods as an object split period and does the simulation of the amount of energy consumption in the building for the object split period by using a quantity of state, concerning thermal environment in the building and corresponding to a starting day of the object split period, as an initial value.~~

[Claim 95] ~~The~~ A simulation device ~~according to claim 8,~~ comprising:

an acquisition unit to acquire a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a

parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

a planning unit to split the simulation period, acquired by the acquisition unit,
 5 into the parallel number so as to generate split periods so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

a simulation unit to do the simulations of the amounts of energy consumption
in the building in parallel, for the split periods generated by splitting by the planning
 10 unit, wherein

the simulation unit sets each of the split periods as an object split period, and
does the simulation for the object split period ~~uses by using~~ a quantity of state,
 concerning the thermal environment in the building, for a day before the starting day of
 the object split period, obtained by performance of the simulation of the amount of
 15 energy consumption in the building for a runway period from a prescribed number of
 days before the starting day of the object split period to the day before the starting day
 of the object split period, as ~~the an~~ initial value.

[Claim ~~56~~] The simulation device according to claim ~~3-2~~ or ~~43~~, wherein

the planning unit sets the starting day of the simulation period or a first
 20 nonoperating day preceding the simulation period, as a starting day of a first split
 period.

[Claim ~~67~~] The simulation device according to ~~any one of claims 3 to 5~~ claim 2 or
3, wherein

in case where the split periods are each set as an object split period and where
 25 a starting day of the object split period is within consecutive holidays in which

nonoperating days continue, the planning unit sets the starting day of the object split period on a first day of the consecutive holidays and sets an ending day of the split period before the object split period on a day before the first day of the consecutive holidays.

5 [Claim 408] A simulation method comprising:

acquiring, by an acquisition unit, a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

10 ~~splitting~~ setting, by a planning unit, the number of days, resulting from division of the number of days of the simulation period by the parallel number with roundup of digits after decimal point, as a reference number of days, and splitting the simulation period into the parallel number so as to generate split periods so that numbers of days of the split periods approximate the reference number of days and so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

doing, by a simulation unit, the simulations of the amounts of energy consumption in the building in parallel, for the split periods.

20 [Claim 9] A simulation method comprising:

acquiring, by an acquisition unit, a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

25

splitting, by a planning unit, the simulation period into the parallel number so as to generate split periods so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

5 doing, by a simulation unit, the simulations of the amounts of energy consumption in the building in parallel, for the split periods, wherein
the planning unit

sets the number of days, resulting from the division of the number of days of the simulation period by the parallel number with the roundup of digits after
10 decimal point, as a reference number of days, sets a day before a first nonoperating day on or after a day that is the reference number of days after a starting day of the simulation period, as an ending day of a first split period, and sets the first nonoperating day as a starting day of a second split period, and

sets a day before an i-th nonoperating day that is a first nonoperating
15 day on or after a day which is the reference number of days after a starting day of an i-th split period, as an ending day of the i-th split period, and sets the i-th nonoperating day as a starting day of an i+1-th split period, sequentially from $i = 2$ to $n-1$, where n is the parallel number.

[Claim 10] A simulation method comprising:

20 acquiring, by an acquisition unit, a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

25 splitting, by a planning unit, the simulation period into the parallel number so

as to generate split periods so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

_____ doing, by a simulation unit, the simulations of the amounts of energy
 5 consumption in the building in parallel, for the split periods, wherein
_____ the planning unit sets the number of days, resulting from the division of the
number of days of the simulation period by the parallel number with the roundup of
digits after decimal point, as a reference number of days, sets a day before an i-th
nonoperating day that is a first nonoperating day on or after a day which is the reference
 10 number of days multiplied by i after a starting day of the simulation period, as an ending
day of an i-th split period, and sets the i-th nonoperating day as a starting day of an i+1-
th split period, sequentially from i = 1 to n-1, where n is the parallel number.

[Claim 11] _____ A simulation method comprising:

_____ acquiring, by an acquisition unit, a simulation period indicating an object
 15 period for which simulations of amounts of energy consumption in a building are to be
done, a parallel number indicating the number of the simulations that are to be
performed in parallel, and a holiday condition indicating nonoperating days of an air
conditioning system installed in the building;

_____ determining, by a condition determination unit, whether an amount of heat
 20 exchange between room interior of the building and outdoors on a nonoperating day
indicated by the holiday condition exceeds a reference value or not;

_____ splitting the simulation period, by a planning unit, in case where it has been
has determined that the amount of the heat exchange exceeds the reference value, the
planning unit splitting the simulation period into the parallel number so as to generate
 25 split periods so that starting days of the split periods other than an initial split period in

the simulation period are the nonoperating days indicated by the holiday condition; and
doing, by a simulation unit, the simulations of the amounts of energy
consumption in the building in parallel, for the split periods.

[Claim 12] A simulation method comprising:

5 acquiring, by an acquisition unit, a simulation period indicating an object
period for which simulations of amounts of energy consumption in a building are to be
done, a parallel number indicating the number of the simulations that are to be
performed in parallel, and a holiday condition indicating nonoperating days of an air
conditioning system installed in the building;

10 splitting, by a planning unit, the simulation period into the parallel number so
as to generate split periods so that starting days of the split periods other than an initial
split period in the simulation period are the nonoperating days indicated by the holiday
condition; and

doing, by a simulation unit, the simulations of the amounts of energy
15 consumption in the building in parallel, for the split periods, wherein
the simulation unit sets each of the split periods as an object split period, and
does the simulation for the object split period by using a quantity of state, concerning
the thermal environment in the building, for a day before the starting day of the object
split period, obtained by performance of the simulation of the amount of energy
20 consumption in the building for a runway period from a prescribed number of days
before the starting day of the object split period to the day before the starting day of the
object split period, as an initial value.

[Claim 13] A simulation program that causes a computer to function as a
simulation device to execute:

25 an acquisition process of acquiring a simulation period indicating an object

period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

5 a planning process of setting the number of days, resulting from division of the number of days of the simulation period by the parallel number with roundup of digits after decimal point, as a reference number of days, and splitting the simulation period, acquired by the acquisition process, into the parallel number so as to generate split periods,~~the planning process splitting the simulation period into the parallel number so~~
10 that numbers of days of the split periods approximate the reference number of days and so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

 a simulation process of doing the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting in the
15 planning process.

[Claim 14] A simulation program that causes a computer to function as a simulation device to execute:

an acquisition process of acquiring a simulation period indicating an object
period for which simulations of amounts of energy consumption in a building are to be
20 done, a parallel number indicating the number of the simulations that are to be
performed in parallel, and a holiday condition indicating nonoperating days of an air
conditioning system installed in the building;

a planning process of splitting the simulation period, acquired by the
acquisition process, into the parallel number so as to generate split periods so that
25 starting days of the split periods other than an initial split period in the simulation period

are the nonoperating days indicated by the holiday condition; and

a simulation process of doing the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting by the planning process, wherein

5 in the planning process

the number of days, resulting from the division of the number of days of the simulation period by the parallel number with the roundup of digits after decimal point, is set as a reference number of days, a day before a first nonoperating day on or after a day that is the reference number of days after a starting day of the simulation

10 period is set as an ending day of a first split period, and the first nonoperating day is set as a starting day of a second split period, and

a day before an i-th nonoperating day that is a first nonoperating day on or after a day which is the reference number of days after a starting day of an i-th split period is set as an ending day of the i-th split period, and the i-th nonoperating day is set as a starting day of an i+1-th split period, sequentially from $i = 2$ to $n-1$, where n is the parallel number.

15 the parallel number.

[Claim 15] A simulation program that causes a computer to function as a simulation device to execute:

an acquisition process of acquiring a simulation period indicating an object

20 period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

a planning process of splitting the simulation period, acquired by the

25 acquisition process, into the parallel number so as to generate split periods so that

starting days of the split periods other than an initial split period in the simulation period
are the nonoperating days indicated by the holiday condition; and

a simulation process of doing the simulations of the amounts of energy
consumption in the building in parallel, for the split periods generated by splitting by
 5 the planning process, wherein

in the planning process, the number of days, resulting from the division of the
number of days of the simulation period by the parallel number with the roundup of
digits after decimal point, is set as a reference number of days, a day before an i-th
nonoperating day that is a first nonoperating day on or after a day which is the reference
 10 number of days multiplied by i after a starting day of the simulation period is set as an
ending day of an i-th split period, and the i-th nonoperating day is set as a starting day
of an i+1-th split period, sequentially from $i = 1$ to $n-1$, where n is the parallel number.

[Claim 16] A simulation program that causes a computer to function as a
simulation device to execute:

15 an acquisition process of acquiring a simulation period indicating an object
period for which simulations of amounts of energy consumption in a building are to be
done, a parallel number indicating the number of the simulations that are to be
performed in parallel, and a holiday condition indicating nonoperating days of an air
conditioning system installed in the building;

20 a condition determination process of determining whether an amount of heat
exchange between room interior of the building and outdoors on a nonoperating day
indicated by the holiday condition, acquired by the acquisition process, exceeds a
reference value or not;

a planning process of, in case where the condition determination process has
 25 determined that the amount of the heat exchange exceeds the reference value, splitting

the simulation period, acquired by the acquisition process, into the parallel number so as to generate split periods so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

5 _____ a simulation process of doing the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting by the planning process.

[Claim 17] _____ A simulation program that causes a computer to function as a simulation device to execute:

10 _____ an acquisition process of acquiring a simulation period indicating an object period for which simulations of amounts of energy consumption in a building are to be done, a parallel number indicating the number of the simulations that are to be performed in parallel, and a holiday condition indicating nonoperating days of an air conditioning system installed in the building;

15 _____ a planning process of splitting the simulation period, acquired by the acquisition process, into the parallel number so as to generate split periods so that starting days of the split periods other than an initial split period in the simulation period are the nonoperating days indicated by the holiday condition; and

_____ a simulation process of doing the simulations of the amounts of energy consumption in the building in parallel, for the split periods generated by splitting by the planning process, wherein

_____ in the simulation process, each of the split periods is set as an object split period, and the simulation for the object split period is done by using a quantity of state, concerning the thermal environment in the building, for a day before the starting day of
25 the object split period, obtained by performance of the simulation of the amount of

energy consumption in the building for a runway period from a prescribed number of days before the starting day of the object split period to the day before the starting day of the object split period, as an initial value.