EXTERNAL DOCUMENT

Overview

The task of this assignment is to create a game name Mathdoku which have rules very much similar to sudoku. The game will accept a square n x n grid and it will solve and show the possible output with number of choices it made. Moreover, inside the grid each cell can have grouping and groups can be connected to different cells. In addition, each grouping will be assigned an operator and a result of the operator. Further, the rules to set a number to a cell is such that no integer appears twice in any row or any column and also put the operator to all the values in one grouping will provide the result assigned to the operator.

The class **Mathdoku** will have following methods:

Boolean loadPuzzle (BufferedReader stream): This method will take a file from user which will contain the information of the puzzle. And it will return true if the file is read successfully and false if the file is empty or null is passed. This method does not check if the file information is enough to create puzzle.

Boolean readyToSolve (): This method will check that the given information is enough to generate the puzzle and if it is enough then further it will pass to solve method to provide the solution or else it will return false.

Boolean solve (): This method is the one which will do the computations and find out whether the provided information can generate any solution and will return true if solution exist or false.

String print (): This method will print the solution of the puzzle.

Int choices (): This method will return the total number of choices It required to solve the puzzle.

Files

There are following files for the program:

1. Block.java
2. Computation.java
3. Coordinate.java
4. CurrentCheckedLocation.java
5. CurrentLocation.java
6. CurrentLocationMain.java
7. InternalCoordinateMax.java
8. MathDoku.java
9. OperatorDecider.java

Data Structure and ADT Used

- I have used map which will help me to keep the track of character and it's all coordinates where it is actually present.
- I have stored the coordinates in the an arraylist.

Explanation

In my code first it creates a map of all the alphabets that are passed as a input through file by keeping track of its coordinates and the exact location of x and y i.e. the rows and columns. Further, the program stores the operation and number related to each unique alphabet in the MathDoku. Once this is configured program tries to fit in the values and perform the operation with associated alphabets keeping all the coordinates of that alphabets in track. Furthermore, this function is called recursively until all the numbers are filled. If the MathDoku does not set the criteria it tries with different values and program always tries to fill the cell first which has max x value and y value for a particular alphabet coordinate.

Assumptions

There are few assumptions for this program:

- The input file will have character for each cell grouping is case sensitive.
- There must be operators provided in the input file to get the solution.

Limitation

- The code will return only one solution to the puzzle.
- My code may take more choices to solve the problem. It is not the most efficient code.

References

[1]"KenKen Solver in WPF", *Codeproject.com*, 2020. [Online]. Available: https://www.codeproject.com/Articles/31574/KenKen-Solver-in-WPF. [Accessed: 03- Mar- 2020].

[2]"Partition.java | download free open source code", *Freesourcecode.net*, 2020. [Online]. Available: http://freesourcecode.net/javaprojects/72583/sourcecode/Partition.java#.Xl2LIqhKhPY. [Accessed: 03- Mar- 2020].