

# MathDoku Instructions

This Game was a project from my Programming 2 module in 2020.

## Starting a Game

Press "Play Game" to start a new randomly generated game with the selected size of grid on the slider(Default is 5x5)

Press "Load From File" and then select the txt file with the format of the grid.

If the structure is correct the game will load otherwise an error message will show and you can try again

To start a game from text input you can type the grid with the correct format in the designated area and then press "Load From Input". If the structure is correct the game will load otherwise an error message will show and you can try again and correct it.

## Entering Cell Values

By Keyboard:

To enter a cell value, you must first click on a cell with your mouse and then press any of the numerated buttons on your keyboard. You will be only able to press buttons from 1 to the size of the grid. For example, for grid 4x4 only 1,2,3,4 will work. Other number presses won't be registered. You can also use the numpad in the same way. In order to clear a value of a cell you have to click on it and then press "Backspace" or "Del" button on your keyboard.

By Mouse:

For mouse enter, select a cell with mouse then click on the numerated buttons on the bottom of game screen. Clear cell by pressing the "Delete" button

## Mistake Detection

Click on the "Show Mistakes" checkbox on the right side of the game screen. Wrong cages will show light red if they have wrong calculations, having 2 same numbers on a row/column will highlight the whole row/column.

"Show Mistakes " updates in real time with each next input or operation

## Win Detection / Animation

Upon solving the puzzle a prompt will show notifying you that you have won and show you how many hints you have used(using more hints than the grid size-2 will show a different prompt as well as if you pressed show solution). A winning animation will show in the same time as the prompt making the whole grid light up in different colours, changing a random grid colour on every 45ms. You can press ok on the prompt to go back on the main menu or move it to the size to enjoy the animation and check your entries.

## Clearing Board

While in a game you can press the button Clear Board, it clears the whole board and makes all cells empty, you can not redo this action!

### Undo/Redo

While in a game on the left side of the screen you will see the Undo and Redo buttons, Which will disable and enable if it is possible to use them.

### Loading Files

From File:

While in the main menu press "Load From File" and then select the txt file with the format of the grid.

If the structure is correct the game will load otherwise an error message will show and you can try again

EXAMPLE PUZZLE CONTENTS OF TXT FILE:

2 1

72x 2,5,6,7

2- 3,4,8

2÷ 9,13,14

3x 10,11

24x 12,15,16

From Text:

While in the main menu to start a game from text input you can type the grid with the correct format in the designated area and then press "Load From Input". If the structure is correct the game will load otherwise an error message will show and you can try again and correct it.

EXAMPLE INPUT PUZZLE:

2 1

72x 2,5,6,7

2- 3,4,8

2÷ 9,13,14

3x 10,11

24x 12,15,16

Limitations (optional):

You can not load games bigger than 8x8 or 1x1

### Font Sizes

On the main menu press the "Font Size" button and prompt where you can choose a font size will show. You can choose between "Small", "Medium", "Large" and "Large+". Default is set to "Medium".

This will adjust the sizes of the numbers in the cells in a game and the size of the answers for a cage

## **Solver**

To solve a puzzle you can click on the “Show Solution” button on the right side of the game screen. This will show a solution for the puzzle that has been generated.

Get hint:

To get a hint you can click on the “Hint” button on the right side of the game screen. This will show a hint and replace a random cell with a correct value for the solution. A hint will show for a cell that doesn't have a value or has a wrong value and will highlight it in green. You can undo this action.

Limitations (optional):

Solving puzzle and showing a hint only works for generated random puzzles, but not for puzzles loaded from a file or from text input.

Files / lines for solver:

TAKES FROM RANDOM GENERATED GRID

In Main.java row 1218 method “makeRandGrid(int size)” generates random grid and there I fill the numbers for the solution

## **Random Game Generator**

Generate puzzle (including options):

To generate a new random puzzle the player must select the desired size in the slider above the green “Play Game” button(default puzzle is 5x5).After specifying the desired size of puzzle the player has to click on the “Play Game” button and a new generated game will start. Cages will randomly be assigned and division, subtraction, addition and multiplication are all able to be assigned.

Files / lines for generator:

In Main.java lines from 1213 to 1405 are all for generating a random puzzle.

METHODS:

```
public static void makeRandomGame(Grid grid, int size)
```

```
public static Cell[][] makeRandGrid(int size)
```

```
public static ArrayList<ArrayList<Integer>> makeCagesNumbers(int n)
```

```
public static void makeRandCages(Grid grid, ArrayList<ArrayList<Integer>>  
cagesGivenNumber, int size)
```

File / lines to ensure there is only one solution:

There is no implementation to check for one solution only.

## **Additional Information**

I haven't tested it on a high resolution screen, It is recommended to be played on a 1080p screen.