4 Dudes 1 Project

Sudoku Puzzle Solver App

**Initial Requirements**

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**Input**

IN-FN-01 The system shall allow the user to enter the original unsolved puzzle through a GUI.

IN-FN-02 The system shall be able to receive input from mouse and keyboard.

IN-FN-03 The system shall be able to read in an unsolved puzzle from a file.

IN-FN-04 The system shall allow the user to select a solve action through a clickable button once the unsolved puzzle is entered.

**Output**

OUT-FN-01 The system shall utilize a GUI to accept user input and display the completed grid after the solve process is run.

OUT-FN-02 The system shall be able to write the initial, unsolved sudoku puzzle to a file.

OUT-FN-03 The system shall display a blank 9x9 grid to accept input into the system.

OUT-FN-04 The user shall have the option to display the board as it's being solved.

OUT-FN-05 The system shall be able to write the final, solved sudoku puzzle, to a file.

OUT-FN-06 The system shall display a completed 9x9 grid after the solve button is pressed and the solve process is completed.

OUT-FN-07 The system shall output music during runtime.

OUT-NF-08 The system shall output the solved sudoku puzzle within five seconds of clicking the solve button.

**Process/Task**

PT-FN-01 The system shall check each row in accordance to the game rules during the solve process.

PT-FN-02 The system shall check each column in accordance to the game rules during the solve process.

PT-FN-03 The system shall check each 3x3 square in accordance to the game rules during the solve process.

PT-FN-04 The system shall store counts of each number in each row and each column.

PT-FN-06 The system shall use the count of numbers to determine probability.

PT-FN-07 The system shall remove numbers from the list of possible correct integers in each box after checking each row, column, and 3x3 box for the same number.

PT-NF-08 The system shall run using Java 1.8 and higher.

PT-NF-09 The system shall work on Windows Vista, 7, 8, 10.

PT-NF-10 The system shall be unavailable no longer than 5 minutes everyday.

PT-FN-11 The system shall be able to solve sudoku puzzle for user.

PT-FN-12 The system shall be able to run the solve process step-by-step for user.

PT-NF-13 The system shall be able to run the program remotely through a connected server.

PT-NF-14 The system shall be compatible with android and IOS systems.

PT-NF-14 The system shall assume all puzzles are solvable.

**Game Rules**

GR-NF-01 The system shall only allow unique integers in every row between 1 and 9.

GR-NF-02 The system shall only allow unique integers in every column between 1 and 9.

GR-NF-03 The system shall require each column and row to contain numbers 1 through 9 without repetition or omission.

GR-NF-04 The system shall only permit unique integers in every one of the 9 3x3 boxes.

GR-NF-05 The system shall only permit one unique solution to each puzzle.