CS101

COURSE PROJECT

SLOT –11

GROUP–16

SRS Report

INTRODUCTION

Sudoku , originally called **Number Place**, is a logic based, combinatorial number- placement puzzle. The objective is to fill a 9×9 grid with digits so that each column, each row, and each of the nine 3×3 sub-grids that compose the grid (also called "boxes", "blocks", "regions", or "sub-squares") contains all of the digits from 1 to 9. The puzzle setter provides a partially completed grid, which for a well-posed puzzle has a unique solution. Sudoku was popularised in 1986 by the Japanese Puzzle Company**, Nikoli**.

PROJECT TOPIC

Sudoku-The Mind Game

APPROACH

- The program will ask the user to enter an incomplete solvable Sudoku puzzle, having a unique solution. If the user is unwilling to enter an incomplete Sudoku, the program will provide with 3 levels of difficulty namely, Easy, Medium and Hard to choose from, after which the

program will generate an unsolved Sudoku of the user's choice of difficulty.

- If the user has entered an unsolved Sudoku, it will be verified for correctness.
- The solution provided by the user is matched with the correct solution. If both the solutions match, a message congratulating the user for the correct solution is displayed.
- If the solution given by the user is incorrect, a message conveying the same is displayed along with the correct solution.

FUNCTION SPECIFICATION

main()

- Sudoku is entered by the user or selected in accordance to the level of difficulty
- If the user decides to enter the incomplete Sudoku by himself then the program asks for the corresponding row, column and value of the known entries
- The relevant functions are called to check the validity of incomplete sudoku

check_sudoku_row()

Number can appear only once in each row

check_sudoku_column()
Number can appear only once in each column

Allowed   Not allowed

check_sudoku_grid()
Number can appear only once in each grid

Allowed   Not allowed

user_solve_sudoku()

• The user attempts to solve the Sudoku and the program asks the user to enter the row, column and value of the position where he wants to input an entry

• A choice to display the correct solution is given

solvesudoku()

• Correct solution to Sudoku is obtained using this function.
• Various other functions like check_row(), check_column(), check_grid(), navigate() and display() are called.

check_row()

- This function accepts a row and a number as its parameter.
- Checks whether we can put the number in the given row or not.
- If the number is already present in the row, it returns 0 to the main function otherwise returns 1.

check_column()

- This function accepts a column and a number as its parameter.
- Checks whether we can put the number in the given column or not.
- If the number is already present in the column, it returns 0 to the main function otherwise returns 1.

check_grid()

- This function accepts a row, a column and a number as its parameter.
- Checks whether we can put the number in the given grid or not.
- If the number is already present in the grid , it returns 0 to the main function otherwise returns 1.

navigate()

- This function moves control to the next cell in case we have already filled one cell with numbers from 1 to 9.

display()

- This function displays the solved Sudoku

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