

SUDOKU QUEST

TOPIC – SUDOKU QUEST

SLOT-11 GROUP-19 TEAM 1

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Introduction:

Sudoku is the most popular logic-based numbers game.

The aim of this game is to place 1-9 into each grid cell so that each number can appear only once in each row, each column and each mini grid.

This Sudoku program starts with a welcome screen featuring 2 choices

➤ Play game:

This option can be selected if the user wants to solve a Sudoku Grid. An incomplete Sudoku Grid is Generated based on the level of toughness chosen by the User.

➤ Give a Sudoku:

This option can be selected if the user needs solution for the user given Sudoku. The Sudoku grid input by the user is solved by using Backtracking Algorithm. If the Sudoku Grid is unsolvable, an error message is displayed.

If the Grid has Multiple Solutions, the first solution encountered by the program is displayed and asks if another solution is required.

The total project is divided into 2 parts.

1.Main Coding

2.Introduction of GUI using GTK+.

The total work of the project is divided as follows:

Azmeera Srinath

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Part of the graphics. Checking validity of multiple solutions for the grid and a part of the Sudoku solving algorithm.

Gowtham B

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Part of the graphics. A part of the Sudoku solving algorithm using backtracking technique and linking the grid to algorithm.

Sahil Konkyana

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Linking the graphics to the program. A part of Sudoku generator. Merging different parts of the program and final debugging.

Shaik Abdul Basith

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A part of Sudoku generator. Developing fine features in graphics .Implementing timer and scorecard(if possible) in the user screen.

Graphical Unit Interface.

This program makes use of GTK header file to create a User Interactive Interface.

GTK (Gimp Tool Kit) is a header file which can be added in the program after installing it and properly linking it with Codeblocks. It provided us a wide range of options which helped us to make our interface more interactive and user friendly.

We were able to add most of the features decided during stage 1.

Main Functions Used:

Function: SolveSudoku

Takes a partially filled-in grid and attempts to assign values to all unassigned locations in such a way to meet the requirements for Sudoku solution (non-duplication across rows, columns, and boxes). The function operates via recursive backtracking: it finds an unassigned location with

the grid and then considers all digits from 1 to 9 in a loop. If a digit is found that has no existing conflicts, tentatively assign it and recur to attempt to fill in rest of grid. If this was successful, the puzzle is solved. If not, unmake that decision and try again. If all digits have been examined and none worked out, return false to backtrack to previous decision point.

Function: FindUnassignedLocation

Searches the grid to find an entry that is still unassigned. If found, the reference parameters row, col will be set the location that is unassigned, and true is returned. If no unassigned entries remain, false is returned.

Function: Instantcheck

Returns a boolean which indicates whether it will be valid to assign num to the given row,col location. As assignment is valid if that

number is not already used in the row, col, or box.

Function: Gen

Void gen is a function used in the program. It generates a random partially filled Sudoku by taking in a completely solved Sudoku as a parameter

Function: Genloop

Void genloop is a function which checks the validity of the random Sudoku generated by gen function..It recursively calls itself while doing so. When the generated Sudoku has more than one solution then it ignores the generated one and calls the gen function to generate a new one.

Miss outs:

- We planned to add timer in the Sudoku screen. But our version of GTK did not support it. Timer function was deprecated in GTK+3.0 version because of which we didn't add it.
- We planned to add pencil marks in our program. But it proved useless because eraser button is already present in our program and entries can be rewritten. So we removed it..