Sudoku

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September 2019

1 Objective

The main objective of this report is to generate any number sudoku puzzles and their corresponding solvers.

1.1 Functions

Functions to check if the position is correct for a given number. This further requires thre functions to check row, column, box, is safe or not.

2 Methodology

The solver works on backtracking algorithm. A function finds empty places in grid and then there is iterator which checks if which numbers can be placed there. After placing a valid number the function again calls itself so the remaining number of positions get filled if there is any point that no number is available the function return false to the previous immediate call. And places another number in that loop and thus after all successive calls the grid is solved.

For generator it feeds a solver a empty grid with a random position placed with a random number. And the iterator tries random number and thus generate a complete sudoku. Then a function removes number from random places and check if the grid is still solvable if yes then it removes next element randomly, else it undoes the previous removal.

3 Results

Successfully achieved most random possible sudoku with all difficulties, that is, with any number of empty places in valid range.

4 Discussion

The code can be made efficient by making the recursive code fast. And the code can be modified to check if the sudoku has a unique solution or not.

5 Conclusion

The code generates matrix of grid in proper user understandable manner and prints solution in same order.

References

[1]https://www.geeksforgeeks.org/sudoku-backtracking-7/
[2]https://www.101computing.net/sudoku-generator-algorithm/