	Department of Computer Engineering Faculty of Engineering University of Sri Jayewardenepura
Course	Programming Quest
Course Code	CO2210
Deadline	On or before 23:55H on 6th September 2021
Assignment Number	01
Total Marks	100
Objectives	● Get familiar with the Programming Quest Continuous Assessment Process. ● Use the data structures and algorithms in solving the practical problem. ● Use good coding practices.

General Instructions

- This is an individual assignment.
- This assignment should be completed using C++ programming language.
- Use the standard header files in the assignment.
- Do not use external libraries in this assignment.
- Submit all source code files (*.cpp) in a zip file. The zip file should be named in the yy_ENG_abc.zip format. (for example, if the index number is 19/ENG/777, the zip file name should be 19_ENG_777.zip.
- Late submission are accepted upto 72 hours from the original deadline but marks will be deducted.
- Submit the zip file to CO2210 Programming Quest LMS page on or before the deadline mentioned above. If the LMS course page is not working, then the zip file can be emailed to randima@sjp.ac.lk .

Quest 01 - Sudoku Puzzle Generator & Solver

Sudoku is a very popular mathematical puzzle. In general, the 9-by-9 cell grid is filled with numbers from 1 to 9 in a random pattern. However, a number appears in a row or a column only once. Further, the 9-by-9 grid is sub divided in to nine 3-by-3 cell grids. A number appears only once within the 3-by-3 cell grid as well.
More details about Sudoku puzzle can be found in the following websites:
https://en.wikipedia.org/wiki/Sudoku
https://www.learn-sudoku.com/what-is-sudoku.html

In this quest, first, generate a Sudoku puzzle with randomly distributed numbers. The number of numbers missing in a row or a column can be between 2 to 4.
Hint: A Sudoku puzzle can be generated with all the numbers and then randomly remove the numbers according to the hardness of the puzzle.

Secondly, an algorithm should be developed to solve the Sudoku puzzle generated in the first step according to the rules. If the algorithm place a wrong number on missing cell, it should be indicated. User can decide to start over the solving process or remove the wrong number start the solving process from previous step.

User can select how many cells are blank/with missing value in a row or column at the beginning of the programme. Then the puzzle is presented to the user. Once the user issue the command to solve the puzzle, algorithm will automatically fill the missing cells step by step, and each step will be displayed to the user while indicating the newly filled cell.