

ECE 1410 Sudoku Program Requirements

Task

Using Microsoft Visual Studio, write a program that includes a class called Sudoku for generating and solving Sudoku puzzles. The class should contain the following public member functions:

- `Sudoku::Sudoku(int n)` – Populates n squares of the 9×9 matrix with legal values
- `int Sudoku::solve()` – Produces a valid solution to the generated puzzle (returns 1 on success, 0 on failure)
- `void Sudoku::printGrid()` – Prints the 9×9 grid

The program should begin by asking for an initial number of squares to randomly (and legally) populate. The initialized grid should then be printed, using * for undetermined values. The program then tries to find a solution.

If a valid solution is found, the solution is then printed to the screen. Otherwise, the message "Sorry, unsolvable" is printed.

Submit a .zip file to Canvas that contains three files: main.cpp, sudoku.cpp, and sudoku.h.

An example of a main.cpp file looks like this:

```
#include "sudoku.h"
#include <iostream>

using namespace std;

int main()
{
    int n;

    cout << "Welcome to SudokuSolver!!" << endl;
    cout << "Enter number of squares to prepopulate: ";
    cin >> n;

    Sudoku s(n);

    if (s.solve()) {
        cout << "Solved!" << endl;
        s.printGrid();
    }
    else {
        cout << "Sorry, unsolvable..." << endl;
    }

    return 0;
}
```

Examples

```
/cygdrive/f/Documents/ECE_1410/Homework/Sudoku
Dr. Phillips@DESKTOP-S7MNR8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ ./sudoku
Welcome to SudokuSolver!!
Enter number of squares to prepopulate: 40
 5  4  *  7  *  6  1  *  3
1  *  3  8  *  *  4  7  *
*  *  9  *  *  3  *  8  5
3  *  *  *  6  *  9  5  *
2  *  5  *  *  *  *  3  *
8  *  *  *  1  7  2  *  *
*  3  *  6  *  *  *  *  9
*  5  *  4  *  8  3  *  7
6  1  4  9  3  *  5  *  *

Sorry, unsolvable...
Dr. Phillips@DESKTOP-S7MNR8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ |
```

```
/cygdrive/f/Documents/ECE_1410/Homework/Sudoku
Dr. Phillips@DESKTOP-S7MNR8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ ./sudoku
Welcome to SudokuSolver!!
Enter number of squares to prepopulate: 20
*  6  4  *  *  *  *  1  5
3  *  *  *  *  9  *  *  8
*  *  *  4  *  *  6  *  *
*  *  *  *  *  1  *  *  *
*  *  3  *  *  *  1  *  *
*  *  *  *  5  *  *  *  *
*  3  5  *  *  *  *  *  *
4  *  8  *  7  *  *  *  6
*  *  9  *  *  *  *  *  *

Solved!
2  6  4  3  8  7  9  1  5
3  5  1  2  6  9  4  7  8
8  9  7  4  1  5  6  2  3
5  4  2  7  3  1  8  6  9
7  8  3  6  9  2  1  5  4
9  1  6  8  5  4  2  3  7
1  3  5  9  4  6  7  8  2
4  2  8  1  7  3  5  9  6
6  7  9  5  2  8  3  4  1

Dr. Phillips@DESKTOP-S7MNR8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$
```