

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

```
Dr. Phillips@DESKTOP-S7MNRE8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ ./sudoku
Welcome to SudokuSolver!!
Enter number of squares to prepopulate: 30
* 4 6 | * 2 * | * * 7
* * * | * * 8 | 1 * 6
* 2 1 | * 6 * | 5 * *
-----
8 * * | * * * | * 2 *
* * * | 6 * 3 | 4 5 8
6 1 * | 7 * 5 | 9 * *
-----
* 9 * | * 1 * | 2 * *
* * * | * * * | * 7 *
* * * | 4 * * | * 6 3

Sorry, unsolvable...

Dr. Phillips@DESKTOP-S7MNRE8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ |
```

```
Dr. Phillips@DESKTOP-S7MNRE8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ ./sudoku
Welcome to SudokuSolver!!
Enter number of squares to prepopulate: 10
* * * | * * 3 | * * *
* * * | * * * | * * 9
* * * | * 8 * | 6 * *
-----
* * * | * * * | * * *
* * * | * * 9 | * * *
7 * 6 | * * * | * 3 *
-----
* * * | * * * | * * 4
* * * | * * * | * * *
* 1 * | * * * | * * *

Solved!

1 2 4 | 6 9 3 | 5 7 8
3 6 8 | 1 5 7 | 2 4 9
5 7 9 | 2 8 4 | 6 1 3
-----
2 3 1 | 4 6 5 | 8 9 7
4 8 5 | 3 7 9 | 1 2 6
7 9 6 | 8 1 2 | 4 3 5
-----
6 5 2 | 7 3 1 | 9 8 4
8 4 3 | 9 2 6 | 7 5 1
9 1 7 | 5 4 8 | 3 6 2

Dr. Phillips@DESKTOP-S7MNRE8 /cygdrive/f/Documents/ECE_1410/Homework/Sudoku
$ |
```