



Faculty of Engineering and Applied Science

SOFE 3950 Operating Systems

Lab 3 - Sudoku Solution Validator

Group Member 1

Name: Daniel Nucci

Student ID: 100655384

Group Member 2

Name: Avdon Racki

Student ID: 100661246

Group Member 3

Name: Nikola Soldatovic

Student ID: 100655244

Group Member 4

Name: Owen Stoll

Student ID: 100661873

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Deliverable 1

See attached code.

Deliverable 2

Modified requirements as per instructions in the lab.

Deliverable 3

There are 2 primary functionalities that the sudoku checker program has: check lines, check boxes. The check lines function is the first way in which we checked the validity of each individual solution by checking if each line in the game is correctly solved. There are 2 threads used for this, one for rows and one for columns. The same goes for the check boxes function, in which each box is checked for all numbers ranging from 1 to 9. Nine threads for the nine boxes in the game are created. All threads combined, there are 11 threads that need to get joined which then if all return 0, the solution is valid and if even one thread returns a 1, the solution is invalid.

```
owen@owen-VirtualBox:~/labs$ cat solution.txt
5 3 4 6 7 8 9 1 2
6 7 2 1 9 5 3 4 8
1 9 8 3 4 2 5 6 7
8 5 9 7 6 1 4 2 3
4 2 6 8 5 3 7 9 1
7 1 3 9 2 4 8 5 6
9 6 1 5 3 7 2 8 4
2 8 7 4 1 9 6 3 5
3 4 5 2 8 6 1 7 9
owen@owen-VirtualBox:~/labs$ ./sudoku_checker solution.txt
Valid solution
```

Figure 1: Demonstrating a valid solution

```
owen@owen-VirtualBox:~/labs$ cat solution2.txt
5 3 4 6 7 8 9 1 2
6 7 2 1 9 1 3 4 8
1 9 8 3 4 2 5 6 7
8 5 9 7 6 6 4 2 3
4 2 6 8 5 3 7 9 1
7 1 3 9 2 4 8 5 6
9 6 1 5 3 7 2 8 4
2 8 7 4 1 5 6 3 9
3 4 5 2 8 9 1 7 9
owen@owen-VirtualBox:~/labs$ ./sudoku_checker solution2.txt
Invalid solution
```

Figure 2: Demonstrating an invalid solution