

INTRODUCTION TO COMPUTER SCIENCE I

PROJECT 2B

Sudoku: The Solver

The second of a two part project, with this one building on Project 2a. Here, you will write a program that solves Sudoku puzzles.

1 Overview

Update your previous work from Project 2a in `sudoku.py`. (You may want to copy that previous work into, say, `sudoku-2b.py`, so that you don't lose your previous work. It's up to you.). Specifically, you must add the following function (and any supporting functions) to your code:

- `solve(grid)`: Given a pointer `grid` to a two-dimensional grid of integers that represent a Sudoku puzzle (with the value 0 representing blank entries), **solve the puzzle**. That is, fill in all of the blank entries such that each row, column, and subgrid contain exactly one each of the digits 1 through 9.

This function should yield one of two outcomes:

1. **Success:** If the puzzle can be solved, leave the grid filled with the correct values and return `True`.
2. **Failure:** If the puzzle cannot be solved, restore the grid such that it contains exactly the values that it had when the function began, and return `False`.

A complete solution for this project should contain a `main()` function that uses the functions above in the following form:

```
def main():
    filename = input('Provide the name of a file
                    that contains a sudoku puzzle: ')
    grid = readGrid(filename)
    print("Unsolved puzzle:")
    printGrid(grid)
    solved = solve(grid)
    if solved:
        print("Solved puzzle: ")
        printGrid(grid)
        valid = checkGrid(grid)
        print("Valid solution? " + str(valid))
    else:
        print("Puzzle unsolvable!")
```

2 Your assignment

Write the solver described above such that the `main()` function in Section 1 should work as advertised.

3 Submitting your work

On the CS submission site, upload your module, which I expect will be named `sudoku.py` or `sudoku-2b.py`.

This assignment is due by Monday, Nov-17, at 11:59 pm.