

Planning Document – Arup Guha Sample Program: Sudoku

Planning Phase

I will store the grid in a 9 x 9 two dimensional array of integers. Since the input is a big string of digits, I will parse the input by reading it in as a string, and converting each character to an integer.

Functions needed: One function to check a row, One function to check a column, One function to check a box. Each function will take in the 9 x 9 grid, as well as the row, column or box to check.

To determine if 9 values are unique, we can just use a frequency array and if any value appears more than once, then we know the set of values is not unique. (This logic will be in all three functions.

Assistance Received

I did not receive any assistance, I worked on the program on my own from start to finish.

Debugging Phase

Tested reading in board by printing it back out. Weird stuff printed out. Realized I forgot the ampersand on numCases. That was the only issue, so after fixing that the board was read in properly. After this miscue, with iterative testing, no further debugging (changes) occurred. Each function was tested as it was written.

Testing Phase

Right after writing checkRows, I tested it on the sample input and also made the three following rows to test it on:

```
111111111
213456789
981234569
```

The program correctly identified that rows 0 and 2 are invalid.

Right after writing checkCols, I tested it on this sample input:

```
1
111111111
613456789
881234563
357648912
216539748
948712536
521486397
463197285
789325164
```

and my program correctly identified that columns 0 and 8 were valid and the rest were invalid.

Tested the box code on the sample and it seemed to work.

After completing the final function, I tested the code on the sample, my third board, a valid fourth board I found on an internet search and a slightly modified version of the fourth board that was only invalid in the last square. My program correctly solved all of these, so then I decided to submit it.