

P1: Solving Sudoku

https://en.wikipedia.org/wiki/Sudoku_solving_algorithms

<https://www.geeksforgeeks.org/sudoku-backtracking-7/>

https://www.tutorialspoint.com/cplusplus/cpp_multi_dimensional_arrays.htm

Algorithm Design - 02/02/21

- 1) What are the various types of sudoku solving algorithms available? (List at least 2)

For solving sudoku there are two main methods:

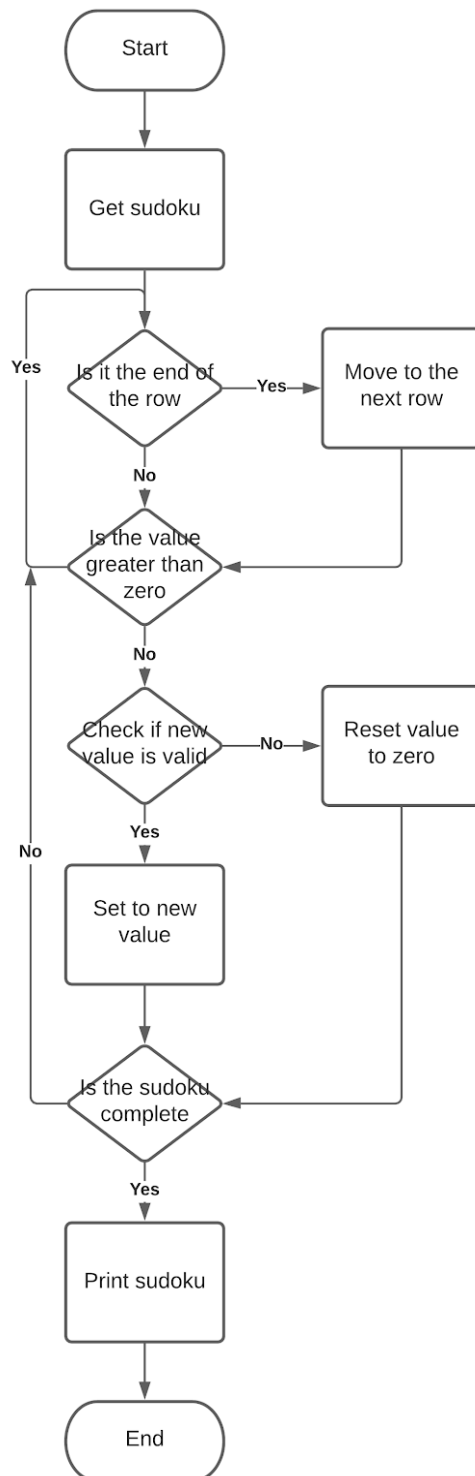
Backtracking is a type of depth-first search algorithm that is looking for the solution using recursion. It will look down the branch until an error is detected and then backtrack till the last split.

Stochastic searches randomly assigns numbers to the cells and then checks for shuffles that reduces the number of total errors. It will keep iterating this until a global maximum is reached, i.e. the sudoku is solved.

- 2) Work together with your partners to decide on the best approach to solve the problem, then, choose one algorithm that you plan to implement in this lab and list down its pros and cons.

I will be implementing a backtracking algorithm. The advantages of this method are the solution is guaranteed and the algorithm is simpler to implement. The disadvantage of this method is the program will be comparatively slow to other algorithms.

- 3) Then, draw a suitable program flowchart to illustrate your approach in your logbook. You may draw multiple flowcharts to explain your program's subroutines or functions if needed.



File Handling - 02/02/21

4) How do you read a character from file in C++?

To read from a file in C++ the <fstream> and <string> headers are needed.

The code will read in the file one word at a time and then print it out to the terminal.

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;

int main()
{
    fstream inputStream;
    string text;

    inputStream.open("lazy_doggo.txt");

    while(!inputStream.eof())
    {
        inputStream >> text;
        cout << text << " ";
    }

    return 0;
}
```

5) How do you read a character from file in C?

To read in a file using c the fgetc command is used on characters and the fgets command is used on strings.

```
#include <stdio.h>

int main()
{
    FILE *fp;

    fp = fopen("test.txt", "r");
    while (!feof(fp))
    {
        char letter = fgetc(fp);
        printf("%s", letter);
    }
    fclose(fp);
}
```

6) Will your answer for 5) work in a C++ code?

My code for part 5 should work in C++ as all C features should work. However, it is recommended against using C libraries as there is the potential to conflict with C++ libraries.