## CSCI 235

Programming Assignment

A maze is specified as a rectangular array of characters, either ‘X’, ‘ ‘, ‘S’ or ‘E’ (letters are uppercase). The ‘X’s represent walls. There is exactly one ‘S’ and one ‘E’. Write an algorithm to find a path from ‘S’ to ‘E’. This is an example of a possible input.

XXXXXXSXXXXX

X X XX X

XXX XX X XX

XX X X

XXXXX XXXEXX

For full credit follow these guidelines.

The maze is given in a file named maze.txt. The only movements allowed are one character up, down, right, left, avoiding the walls of course.

Show the output as a diagram of the same type as the input where you indicate the path with an appropriate symbol. For the above input for instance you could output

XXXXXXSXXXXX

X X...XX X

XXX .XX X XX

XX X...... X

XXXXX XXXEXX

Obviously several paths are possible in general; you are asked to show one of your choice. Alternatively, if there is no path as specified above, your program should output an appropriate message. Send your output to result.txt. Assume that input and output files are in the same directory as your executable.

**Notes on how to solve this motherfucker:**

1. **Use recursion**
   1. **Basic movement is up, down, left, right**
      1. **Program will constantly attempt to move to a valid spot ‘ ‘ until it meets the base case, which is ‘E’**
         1. **If not possible, output will say so**
2. **Maze is basically a 2D array (works basically as a matrix, in which each spot has a (i,j) coordinate**
3. **Program will search for ‘S’ and start from there. S and E must always be at edge** 
   1. **Each text file has only one maze**
4. **Be sure to make a list of visited paths so that it does not repeat**