CS 2420
Fall semester section 01
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Chapter 7 Maze

```java
import java.io.File;

/**
 *
 * @author
 * @version
 *
 */

public class Recursion {

    public static void main(String[] args){


        solveMaze("Maze1-easy.txt");
        solveMaze("Maze2-manyChoices.txt");
        solveMaze("Maze3-Large.txt");
        solveMaze("Maze4-No_Solution.txt");
        solveMaze("Maze5-Larger.txt");
    }

    //Probably not void, or 0 arguments
    public static String[][] readMazeFromFile(String filename) {
        try {
            Scanner in = new Scanner(new File(filename));
            int rows = in.nextInt();
            int cols = in.nextInt();

            String[][] maze = new String[rows][cols];
            for(int i =0; i < rows; i++) {
                for(int j = 0; j < cols; j++) {
                    maze[i][j] = in.next();
                }
            }
```

My main where all call each maze to solve it and my readMaze method to call the txt file into scanner and read it in.

```
            }
            return maze;
        }
        catch(FileNotFoundException e){
            e.printStackTrace();
            return null;
        }
    }

    //Probably not 0 arguments
    public static void printMaze(String[][] m) {
        int rows=m.length;
        int cols=m[0].length;

        for(int i =0; i < rows; i++) {
            for(int j = 0; j < cols; j++) {
                System.out.print(m[i][j]);
            }
            System.out.println();
        }
    }

    //This method is what the book calls the "driver" method
    public static void solveMaze(String filename){
        //setup all the variables correctly
        System.out.println("Working on maze " + filename);


        String[][] maze = readMazeFromFile(filename);
        printMaze(maze);
        int[] array = start(maze);
        System.out.println("The starting location is: " + array[0] +", " + array[1]);
        //trying to find start position by going through the loop
```

PrintMaze method where I do the nested for loop to print the maze out. Also my solve maze where I go to find the startting position then traverse through the maze until I find the right way.

```java
    public static boolean mazeTraversal(String[][] maze, int x, int y){
        if (x<0 || y<0 || x >= maze.length || y >= maze[0].length){
            return false;
        }
        if(maze[x][y].equals("#")) {
            return false;
        }
        if(maze[x][y].equals("?")) {
            return false;
        }
//      if(maze[x][y].equals("X")) {
//          return false;
//      }
        if(maze[x][y].equals("E")){
            printMaze(maze);
            return true;
        }
        if(maze[x][y].equals("S")) {
            maze[x][y] = "?";
        }
        if(maze[x][y].equals(".")) {
            maze[x][y] = "?";
        }

        //goes right
        boolean foundTheEnd = mazeTraversal(maze, x+1, y);
        //goes up
        foundTheEnd = mazeTraversal(maze, x, y+1);
        //goes down
        foundTheEnd = mazeTraversal(maze, x, y-1);
        //goes left
        foundTheEnd = mazeTraversal(maze, x-1, y);
```

My base cases where I go through everything also recusion where I call it until it finds a solution if there is one.

```
        if (foundTheEnd ==true) {
            return true;
        }
//      else {
//          maze[x][y] = "X";
//      }
        //will need an "X" which means that every option doesn't work and they have given up (li
//      if(false) {
//
//          return false;
//      }
        //Note, you should not need any loops.  Your first instinct might be to add them, but ig
        //Loops are for iteration, not recursion
        return false;
    }


}
```

If there is a solution then I return true if there is not then I return false.

```
Working on maze Maze1-easy.txt
#####
S..##
##..E
#####
The starting location is: 1, 0
#####
???##
##??E
#####



Working on maze Maze2-manyChoices.txt
......
#..#..
..##..
...#.#
..E#S.
......
The starting location is: 4, 4
......
#..#..
..##..
...#.#
??E#??
??????
......
#..#..
..##..
.??#.#
??E#??
??????
??????
#??#??
```

```
??E#??
??????
......
#..#..
..##..
.??#.#
??E#??
??????
??????
#??#??
??##??
???#?#
??E#??
??????



Working on maze Maze3-Large.txt
#....##.#
#.##.##.#
#..#E...#
#.#####..
#.#.....#
#.#.#.###
....###..
#.#.#...#
#.#.#.###
#.#.....S
#########
The starting location is: 9, 8
#????##.#
#?##?##.#
#??#E...#
#?#####..
```

```
#?#?????..
#?#.....#
#?#.#.###
????###..
#?#?#...#
#?#?#.###
#?#??????
#########
#???##.#
#?##?##.#
#??#E???#
#?######??
#?#?????#
#?#?#?###
????###..
#?#?#...#
#?#?#.###
#?#??????
#########



Working on maze Maze4-No_Solution.txt
#S.##
#.#.#
##.E#
The starting location is: 0, 1
```

```
Working on maze Maze5-Larger.txt
#####################################################
#...#...#.........#.....#.......#.....#...........#
#.#.#.#.#.#######.###.###.#####.###.#.#.#.#######.#
#.#...#...#.#...#...#...#...#.#...#.#.#.#.......#.#
#.#########.#.#.###.###.###.#.###.#.#.#########.#.#
#...#.......#.#...#.....#.#.#...#.#.#.......#...#.#
#.#.#.###.#.#.###.#####.#.#.#.#.#.#.#######.#.#####
#.#.#.#...#.#...#.....#.#.#.#.#.#...#.....#.#.#...#
#.#.#.#.#######.###.###.#.#.#.#########.###.#.#.#.#
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#.#.###############.#######.#.#.###.#.#.###.###.###.#
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#.#.#.#.#.#####.###.###.###.#########.#.###.###.#.#
#.#...#.......#.#...#.#...#.....#...#.#...#.#...#.#
#.###############.#.###.###.#####.#.#.###.###.#.###.#
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#.#####.############.###.############.###.#########.#
```

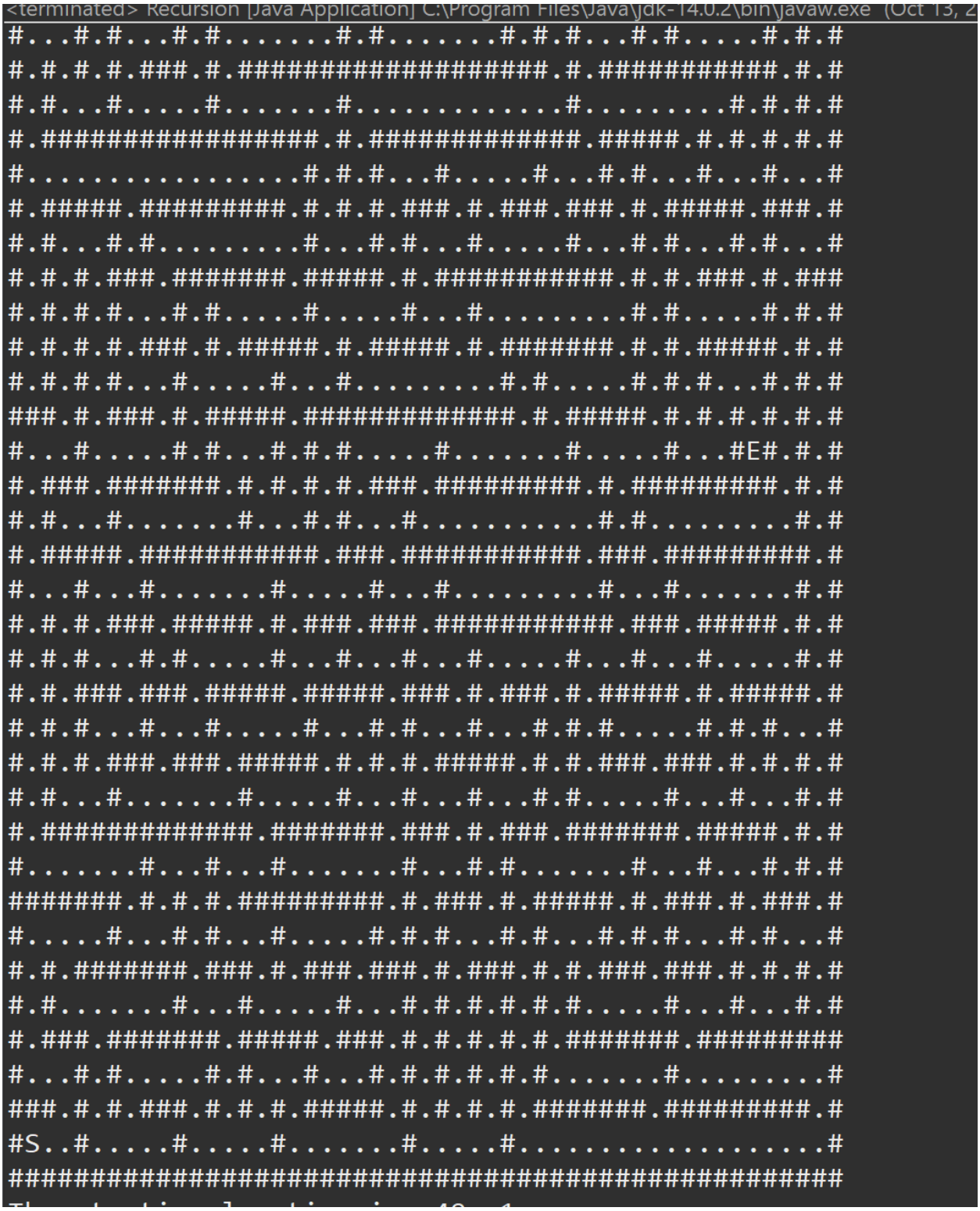
<terminated> Recursion [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe (Oct 13, 2
#...#.#...#.#.......#.#.......#.#.#...#.#.....#.#.#
#.#.#.#.###.#.####################.#.###########.#.#
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#.................#.#.#...#.....#...#.#...#...#...#
#.#####.#########.#.#.#.###.#.###.###.#.#####.###.#
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#S..#.....#.....#.......#.....#.....................#
###

```
The starting location is: 49, 1
##################################################
#...#...#.........#.....#??????#????#??????????#
#.#.#.#.#.#######.###.###?#####?###?#?#?#?#######?#
#.#...#...#.#...#...#...#???#.#???#?#?#?#???????#?#
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#.#.#.#...#.#...#.....#.#.#?#.#.#???#.....#?#?#???#
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#.#.#.#...........#.......#?#.....#.....#???#???#?#
#.#.##############.#######.#?#.###.#.#.###?###?###?#
#.#.#...#.......#.#?????#.#?#...#...#...#???#?#???#
#.#.#.#.#.#####.###?###?###?#########.#.###?###?#?#
#.#...#.......#.#???#?#???#????#???#.#...#?#???#?#
#.##############.#?###?###?#####?#?#?###.###?#?###?#
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```

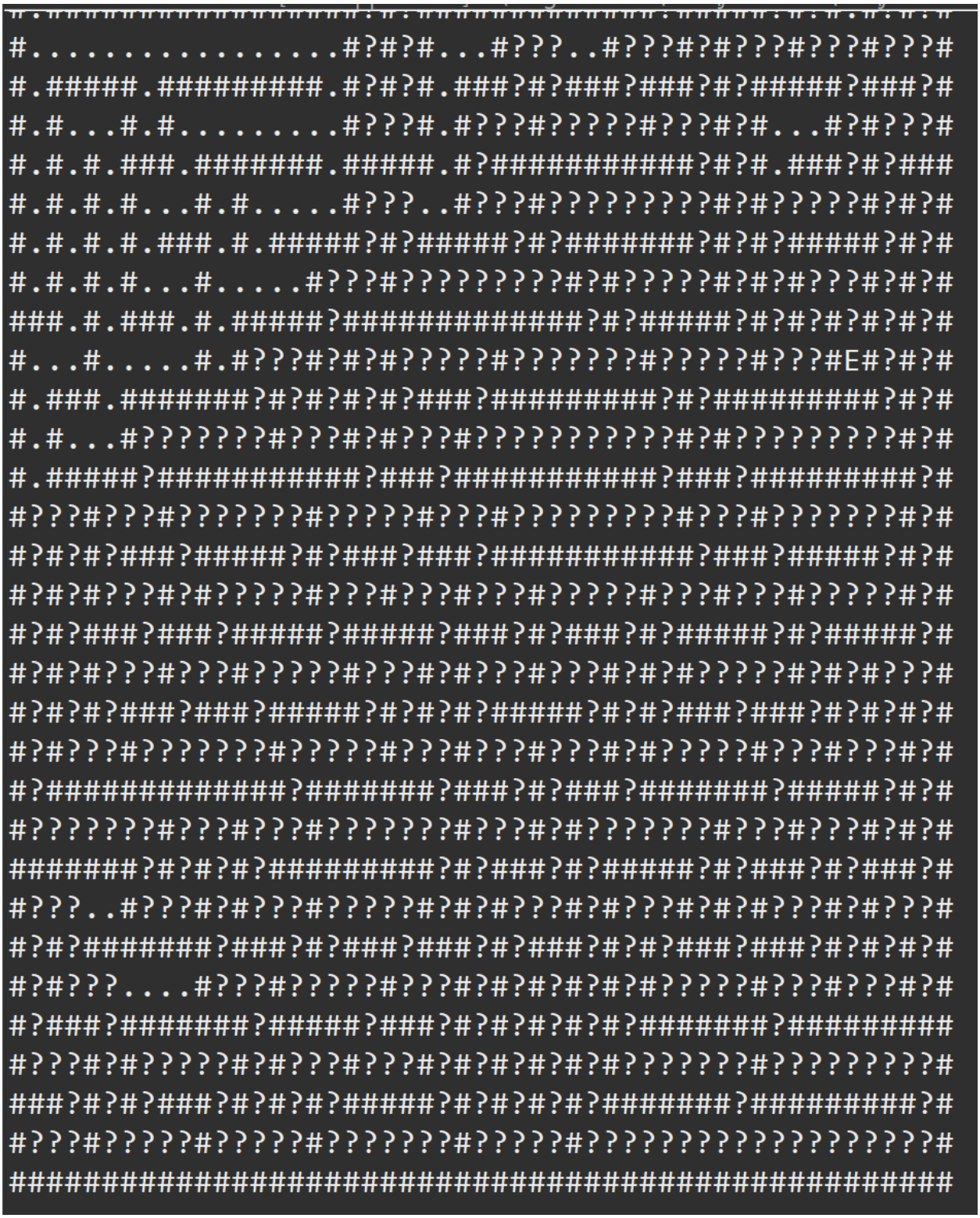

What was the output