A+ Computer Science	Graphs – Shortest Path Maze	Lab Value - 100

Lab Goal : This lab was designed to teach you more about recursion.

Lab Description : Take in any maze and determine if there is an exit path. A valid path will be a continuous block of 1s that connect the top left corner to any spot on the far right column. A valid path can only be connected horizontally or vertically. Diagonal connections are not legal. The 1s in the file represent the path and 0s represent the walls of the maze. Output shortest path of X if there is a path leading to an exit out of the maze. Output no path if there is not a path leading out of the maze. Output the shortest path distance and the path itself represented by 9's(the path itself is the most challenging part).

Helpful Hints / Assumptions: All input will be 1s and 0s. The 1s represent the path and 0s show that there is no path in that area.

Sample Output :

```
1 0 0 0 1
1 1 1 1 0
0 0 1 0 1
0 1 1 1 0
0 0 0 0 1
no path

9 0 0 0 0 9 9
9 9 9 1 0 9 0
0 0 9 0 0 9 0
0 1 9 9 0 9 0
0 1 0 9 0 9 0
0 1 0 9 9 9 0
0 1 0 1 0 0 1
shortest path of 17

1 0 0 0 0 1 0
1 1 1 1 0 1 0
0 0 1 0 0 1 0
0 1 1 1 0 1 0
0 1 0 1 0 1 0
0 1 0 1 1 1 0
0 1 0 1 0 1 0
no path

9 0 1 1 0 1 0
9 9 9 1 1 1 0
0 0 9 0 0 0 1
0 1 9 9 9 9 9
0 1 0 1 0 1 0
1 1 1 1 1 1 0
0 1 0 1 0 1 0
shortest path of 10

9 0 1 1 1 1 1 1 1 0
9 9 9 9 9 9 9 9 9 9
1 0 1 0 0 0 1 1 1 0
1 1 1 1 1 1 1 1 0 1
1 1 0 1 0 1 0 1 0 1
1 1 1 1 1 1 0 1 1 1
1 1 0 1 0 1 0 0 0 1
1 1 1 1 0 1 0 0 0 0
1 1 0 1 0 1 0 1 1 1
1 1 1 1 1 1 1 1 1 1
shortest path of 11

9 9 9 9 9 9 9 9 9 9
1 1 1 1 1 1 1 1 1 1
0 0 1 0 0 0 1 1 1 0
0 1 1 1 1 1 1 1 0 1
0 1 0 1 0 1 0 1 0 1
1 1 1 1 1 1 0 1 1 0
0 1 0 1 0 1 0 0 0 0
0 1 1 1 0 1 0 0 1 1
```

Files Needed ::

ShortestPathMaze.java
ShortestPathMazeRunner.java

Sample Data :

```
5
1 0 0 0 1
1 1 1 1 0
0 0 1 0 1
0 1 1 1 0
0 0 0 0 1
7
1 0 0 0 0 1 1
1 1 1 1 0 1 0
0 0 1 0 0 1 0
0 1 1 1 0 1 0
0 1 0 1 0 1 0
0 1 0 1 1 1 0
0 1 0 1 0 0 1
7
1 0 0 0 0 1 0
1 1 1 1 0 1 0
0 0 1 0 0 1 0
0 1 1 1 0 1 0
0 1 0 1 0 1 0
0 1 0 1 1 1 0
0 1 0 1 0 1 0
7
1 0 1 1 0 1 0
1 1 1 1 1 1 0
0 0 1 0 0 0 1
0 1 1 1 1 1 1
0 1 0 1 0 1 0
1 1 1 1 1 1 0
0 1 0 1 0 1 0
10
1 0 1 1 1 1 1 1 1 0
1 1 1 1 1 1 1 1 1 1
1 0 1 0 0 0 1 1 1 0
1 1 1 1 1 1 1 1 0 1
1 1 0 1 0 1 0 1 0 1
1 1 1 1 1 1 0 1 1 1
1 1 0 1 0 1 0 0 0 1
1 1 1 1 0 1 0 0 0 0
1 1 0 1 0 1 0 1 1 1
1 1 1 1 1 1 1 1 1 1
10
1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1
0 0 1 0 0 0 1 1 1 0
0 1 1 1 1 1 1 1 0 1
0 1 0 1 0 1 0 1 0 1
1 1 1 1 1 1 0 1 1 0
0 1 0 1 0 1 0 0 0 0
0 1 1 1 0 1 0 0 1 1
0 1 0 1 0 1 0 1 1 1
```

```
0 1 0 1 0 1 0 1 1 1
0 1 1 1 1 1 0 1 1 1
shortest path of 10
```