

Northern Michigan University (Marquette Co, MI)

CS 222-61-21W: Data Structures

Program 3

Due: Wednesday 3 March 2021 10:00 A.M. EST

Maze Solving

Create a folder called "PG3" in the top level of your CS222-61-20W folder. Place all files pertaining to this assignment into the top level of your PG3 folder. Place a (possibly empty) file called "DONE" into this folder when you are ready to have your programs graded. The only files you need to turn in are the .cpp and the .h files. Please don't turn in any files other than these!!

For this program, you will read in a maze and compute the shortest path from the start point to the destination point. The maze is a rectangular grid consisting of spaces and stars. The start point is the upper left corner. The end point is the lower right corner. You can move wherever there are spaces. You cannot move wherever there are stars. Your program will then print out the maze with the path taken marked by X's. If there is a tie for shortest path, it doesn't matter which one your program discovers.

For example,

```
Enter the width of the maze: 6
Enter the height of the maze: 6
Please enter the maze below
*****
*****
```

```
  **
  **
SOLUTION
X*****
X*****
XXXXXXX
  X
  ** X
  ** X
```

or

```
Enter the width of the maze: 6
Enter the height of the maze: 6
Please enter the maze below
*****
*****
```

*
*
**

SOLUTION

X*****
X*****
XX *
X *
X**
XXXXX

Maze Solving is a natural queue problem. Queue code has been provided for you to complete this project. We will discuss how to do this in class. You must use a queue to solve this problem. You are only allowed to interact with the queue using ENQUEUE, DEQUEUE, and EMPTY. You are not allowed to add additional methods or to get information out of the queue in any other way.

There will always be at least one path through the maze.