

COP 3503 Recitation #8 Problem: Backtracking (Week of 7/8)
Due: 7/18/13 (Thursday) at 11:55 PM Webcourses2 time

The Problem: Robot Navigation

Your goal is to navigate a robot from one side of the room to another. Your robot can only travel in four basic directions from its current location: up, down, left, and right. Given a map of the room with obstacles, determine whether or not the robot will be able to get to the other side of the room.

Your robot must always start at position (1,0), specifying the door to the room. The map given will be of size $n \times n$. Thus, if you determine whether he can find a path to $(x, n-1)$ where x is any number between 0 and $n-1$, you will have found out if he can travel to the other side of the room.

Note: Directly read your input from the input file, maze.in. Turn in your program file, Maze.java.

Input Format (for maze.in)

There will be several sets of input. The first line will contain a single positive integer m ($m < 100$) describing the number of test cases in the data set. The first value of each data set will be a positive odd integer n ($n < 200$), representing the size of the $n \times n$ map. Following will be the $n \times n$ map specified by n characters on the next n lines, where an 'x' denotes an obstacle and a '_' denotes a passable area.

Output Format

For each data set, your output will be of the following format

Data Set k: The robot CAN get to the other side.

Data Set k: The robot CAN NOT get to the other side.

where k is an integer in between 1 and m , inclusive.

Sample Input

```
3
5
xxxxx
__x__
x__x
x_x_x
xxxxx
15
xxxxxxxxxxxxxxxxxxx
_____x_____
x_xxx_x_xxxxxxxxxx
x_x_x_x_____x
x_x_x_xxx_x_xxx
x_x_____x_x_x_x
x_x_xxx_xxx_x_x
x_x_x__x__x_x
x_x_x_xxx_xxx_x
x_x_x_x__x__x
x_x_x_x_xxx_x_x
x_x_x_____x_x
x_x_xxxxxxxxxx_x
x_x_xxxxxxxxxx_x
xxxxxxxxxxxxxxxxxxx
15
xxxxxxxxxxxxxxxxxxx
_____x_____
x_xxx_x_xxxxxxxxxx
x_x_x_x_____x
x_x_x_xxx_x_xxx
x_x_____x_x_x_x
x_x_xxx_xxx_x_x
x_x_x__x__x_x
x_x_x_xxx_xxx_x
x_x_x_x__x__x
x_x_x_x_xxx_x_x
x_x_xxxxxxxxxx_x
x_x_xxxxxxxxxx_x
x_x_xxxxxxxxxx_x
xxxxxxxxxxxxxxxxxxx
```

Sample Output

Data Set 1: The robot CAN get to the other side.

Data Set 2: The robot CAN get to the other side.

Data Set 3: The robot CAN NOT get to the other side.

Please prepare a pseudocode that best describes the operation of your program and include ample comments in your code.