DATA STRUCTURES AND ALGORITHMS

HOME WORK 03

MARKS 100

Instructions

Work on this home work individually. Absolutely NO collaboration is allowed. Any traces of plagiarism would result in a ZERO marks in this home work and possible disciplinary action.

Due Date

Paste the solution(s) folder of the problems (source code .cpp files only) labeled with your complete roll number in DSAM – HW 03 and DSAA – HW 03 folders for morning and afternoon sections respectively on Wednesday, April 20, 2011 before 01:00 PM. These folders are available at \\printsrv\Teacher Data\Umair Babar\Students

What you have to do

Consider the problem of a trapped mouse that tries to find its way to a destination in a maze. The mouse hopes to reach there from the stating point by systematically trying all the routes. If it reaches a dead end, it retraces its steps to the last position and begins at least one more untried path. For each position, the mouse can go in one of the four directions: **left**, **right, down**, **up**. Regardless of how close it is to the exit, it always tries the open paths in this order, which may lead to some unnecessary detours.

You have to implement a program that will read a maze from a file **input.txt** and help the mouse to find a way out **recursively**. You have to show the complete **path** followed by the mouse to reach to the required position. If **no** path leads to the **destination** display an appropriate message. The maze consists of **0s(empty)** and **1s(obstacles)**.

The input file is in the following format:

Line 1: two numbers separated by space indicates the **size** (rows and columns respectively) of the maze
Line 2: two numbers separated by space indicates the **position** of mouse in the maze in row and column format.
Line 3: two numbers separated by space indicates the **destination** of mouse in the maze in row and column format.
Line 4: On the next line the maze started.

Input.txt

```
5 5
1 0
4 4

1 1 1 1 1
0 0 1 0 1
1 0 0 0 0
0 1 0 0 1
1 1 1 0 0
```

Possible Output

```
1 1 1 1 1
m m 1 0 1
1 m m m 0
0 1 0 m 1
1 1 1 m m
```

NOTE: - No submission will be accepted after the DUE TIME and DATE.

B E S T O F L U C K