Report Problem 4

Idea

Find a path through which the driver can reach the destination following the given conditions. When the driver moves through a square or cell then indicate it in the solution map. Like that we can show the path in chosen in the map. Apart from that, indicate the moves done by the driver (up, down, left, right) and how many turns it has done. Try all the possibilities until a path is found through backtracking.

Methodology

The algorithm did the following:

If the driver reaches the destination: print the solution map.

If the driver doesn't reach its destination trying all the possibilities: print a message saying no solution was found.

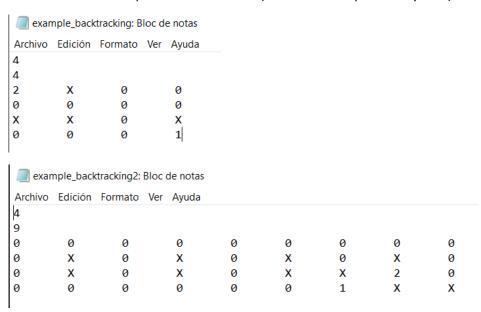
If the driver doesn't reach its destination: mark the current cell as a solution in the solution map. Check the last direction taken and only move forward or turn to the right. For example, if the last direction was "up", then we can move either upwards or turn to the right (we can't turn to the left neither do a 180° turn). While moving, for the specific path, we count the times the driver has turned right.

If the previous movement doesn't lead to a solution after trying all the possible movements then use backtracking and mark the current cell as 0 (doesn't form part of the path).

Input File

A file "example backtracking.txt", with the following format:

- Line 1: Number of rows (F).
- Line 2: Number of columns (C).
- Line 3: Description of the first row (C characters separated by tabs).
- Line 4: Description of the second row (C characters separated by tabs).
- Line N + 2: Description of the last row (C characters separated by tabs).



Output file

Following the "example_backtracking.txt"

```
In output_backtracking: Bloc de notas

Archivo Edición Formato Ver Ayuda

Moves(from latest to earliest): Up Left Left Down Right Up Up Up Left
The driver turned right 5 times.
The path taken is the following one (Start = 1, Destination = 2, Path = 3):
2 0 3 3
3 3 3 3
0 0 3 0
0 0 3 1
```

Following the "example_backtracking2.txt"