Problem 2 – 3D Labyrinth

You are given a 3D Labyrinth, divided into **cubes**. The labyrinth consists of **levels** (floors). Essentially, each **level is a horizontal 2D matrix of cubes**.

You can move in the 3D labyrinth just as you would in an apartment building – you **can move to each of your neighboring cubes on the current level**. Two **cubes** on a floor are **neighbors if they share a common wall** (so each cube has a front, back, left and right neighbor, except for the cubes on the edges and sides, which obviously don't have all 4 neighbors).

In some cases, **when there's a ladder or stairway**, you can also **move from one floor to the other**, that is, the **cube directly above or below** you becomes also one of your neighbors.

The number of levels in the labyrinth is exactly **L**. The number of columns for each level is **C** and the number of rows in each level is **R**.

Each cube in the labyrinth can be defined by its position – the level, the row and the column on which the cube is. So if a cube is defined as being on position **(X, Y, Z)**, that means it is on the **X^{th} level**, the **Y^{th} row** and the **Z^{th} column**. Levels, rows and columns are **numbered beginning from 0**. For example, the corner cubes of the bottom level are: (0,0,0), (0,0,C-1), (0,R-1,C-1), (0,R-1,0) – in clockwise order, if you imagine the first level as a matrix.

Some of the cubes in the labyrinth **are impassable**. They are filled with stone and you cannot move into or through them.

Other cubes in the labyrinth **are ladders** – some of them allow you to **move to the upper level**, some allow you to **move to the lower level**. Every **ladder is one-directional** – it only allows you to **travel either up or down** – which means that if you went up one ladder, you cannot go down the same ladder.

Find **minimum number of moves** that are required to **escape the labyrinth**, given a **starting location** and the cubes in the labyrinth. To escape the labyrinth you need to be **on top of the labyrinth** (above highest level) or **below the lowest level**. For example if the given labyrinth has 6 levels (0 to 5) you need to be on level -1 or level 6 in order to escape it).

Input

The input data should be read from the console.

On the first line there will be the numbers **X**, **Y** and **Z**, separated by spaces. These numbers represent your **starting location** – X is the starting level, Y is the starting row, Z is the starting column.

On the next line, of the standard input, there will be the numbers **L**, **R** and **C**, separated by whitespaces.

On the following lines, until the end of the input, there will be **L descriptions** of **RxC matrices**. Each matrix is represented on exactly **R lines**, each containing exactly **C symbols**. The **first matrix** corresponds to the **first level** of the labyrinth; the **second matrix** corresponds to the **second level** of the labyrinth and so on.

Each symbol in a matrix description can be:

- '**.**' (dot) – meaning an empty cube ,'**U**' – meaning a ladder to the upper level (X+1), '**D**' – meaning a ladder to the lower level (X-1), '**#**' – meaning an impassable cube

The input data will always be valid and in the format described. There is no need to check it explicitly.

Output

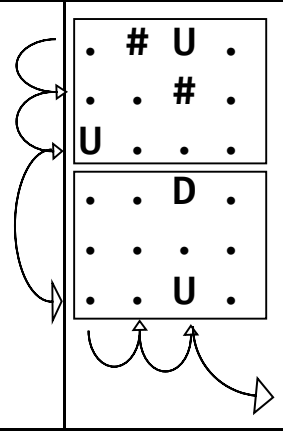
The output data should be printed on the console.

On the only output line, print the **minimum number of moves** needed to escape the labyrinth.

Constraints

- **L, R and C** will be between 1 and 100, inclusive. **X, Y and Z** will be between 0 and 99, inclusive.
- There will always be way to escape the labyrinth
- The start position will never be an impassible cube ('#')
- There are NO special restrictions on positioning of the labyrinth elements ('#', 'U', 'D', '.')
- Allowed working time for your program: 0.3 seconds.
- Allowed memory: 16 MB.

Examples

Example input	Example output	Explanation
0 0 0 2 3 4 .#U. ..#. U... ..D. .... ..U.	6	

Example input	Example output
2 0 2 3 4 3 ... .#. .#. .#D ... ... ##. D.. ..D ... ##. ...	16