

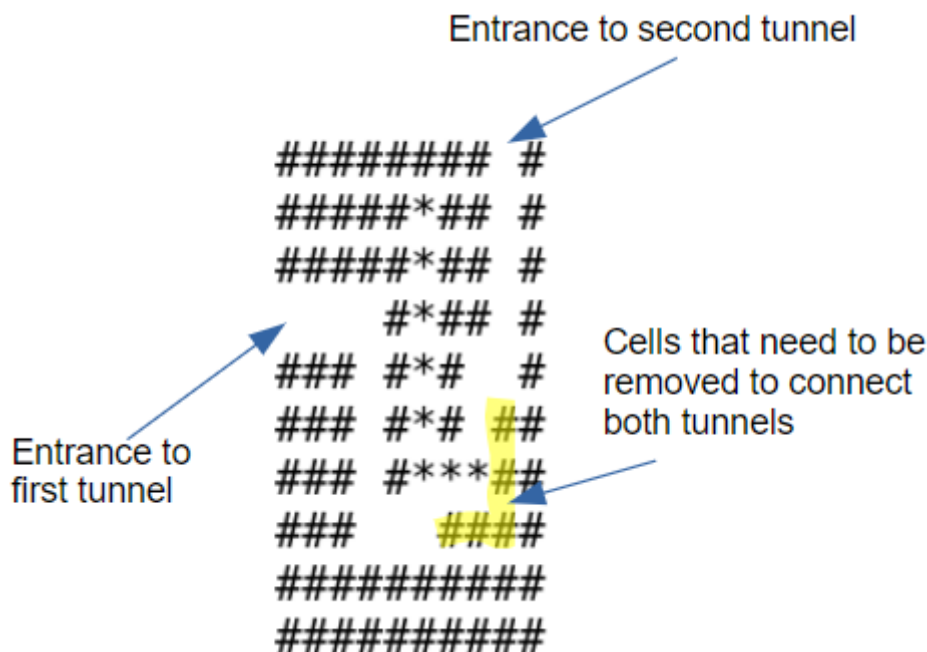
D - Unfinished Labyrinths

The Problem

Your business specializes in the design and construction of subterranean labyrinths. You have a number of projects which have been left unfinished and you need to complete those labyrinths excavating the least amount of dirt.

Each unfinished labyrinth has two entrances that lead to two tunnels. These tunnels are unconnected and you need to find the shortest path to join them. You can start drilling the connecting segment at any point from the first tunnel and it can reach to any point of the second tunnel. The new tunnel segment will need to avoid hard rock terrain which cannot be excavated.

In the image below you can see an example where the minimum number of cells that need to be excavated is 5.



The Input

The input format is as follows:

An integer in a single line which says the number of problems to solve. Then, for each problem:

- A line with two integers: the height and width of the labyrinth.
- A line with two integers: the coordinates of the entrance to the first tunnel.
- A line with two integers: the coordinates of the entrance to the second tunnel.
- The map of the current labyrinth represented as a matrix of characters with as many rows as the height of the labyrinth and as many columns as its width. Each character represents a cell which can be:
 - Unexcavated dirt, represented by #.
 - An excavated cell, represented by a space. Tunnels are comprised of adjacent excavated cells. Note that a cell is considered adjacent to those immediately above and below it and to those immediately to the left and right (i.e., each cell

has up to four adjacent cells, and nearby cells in diagonal are not considered adjacent).

- A rock, represented by *. Rocks cannot be excavated.

Note that rows and columns are numbered starting from 0.

The Output

For each problem, a line with a number by itself representing the number of cells that need to be excavated to join the two tunnels of the labyrinth.

Sample Input

```
1
10 10
3 0
0 8
##### #
#####*## #
#####*## #
    #*## #
### #*# #
### #*# ##
### #***##
###    ####
#####
#####
```

Sample Output

5