

# Problem FIFA2: Fifa World Cup II

Do you know Raimund? I do not know how, but he has managed to hold some tickets for the final game in Berlin. Two teams have played a fascinating tournament and are facing each other consequentially in the final. The stadium is completely full - except for a single seat. The fans are in good mood all together and the weather could not be better. Thus it will be a great experience for everybody in the *Olympiastadion* in Berlin.



Figure 1: *Olympiastadion*, Berlin

The kick-off will soon take place but Raimund is not in the stadium! Where is he? Something in his backpack attracted the attention of the security people at the entrance. Security suspected Raimund to be a hooligan and arrested him. After a while the police gave the all-clear and released Raimund. He is left in front of the arrest cells under the stadium in the catacombs. However, here are a police station, a running track, the soccer teams' changing rooms, a VIP underground parking lot, showers, the referee cabins, and so on. Raimund does not know the shortest way out. And as he is very anxious and somewhat offended because of the arrest he does neither watch out for any site plan nor does he ask someone for directions to get to his seat.

Since the game will start in a few minutes he has to hurry. What is the **longest** way out of the catacombs into the stadium? Will Raimund be at his seat on time even if he takes this longest path?

## Input

The input consists of several scenarios. Each scenario starts with two integers  $h$  and  $w$  in one line ( $1 \leq h, w \leq 15$ ).  $h$  denotes the height and  $w$  the width of the following site plan.

The site plan only consists of the ' ' and the '# ' character. ' ' denotes a free floorway cell and '# ' is a blocked cell (by a wall, a closed door or something else).

After these  $h$  lines, there are 2 more lines with start position and end position respectively. The position is made up of 2 integers, the  $x$  and the  $y$  coordinate (the cell in the bottom left corner has coordinates 0 0).

The last line of each scenario contains the number of seconds  $s$ , that are left before the kick-off takes place. You can assume that Raimund can run from a cell to a non-blocked adjacent cell (only into the 4 directions, not diagonally) in 5 seconds. There are never more than 1, 234, 567 valid paths from start position to target position, but there is at least one.

The input is terminated by *EOF*.

## Output

Assume Raimund takes the **longest** path out of the catacombs. But be aware that he never enters any cell twice.

If he is on his seat before the kick-off (that means *running time* < *remaining time*), print ":)" otherwise print "; (" on one line.

*(Sample Input and Output are provided on the next page)*

### Sample Input 1

```
6 10
#####
#      ##
#  #### ##
##      ##
# ## ##
#####
2 2
9 1
100
6 10
#####
#      ##
#  #### ##
##      ##
# ## ##
#####
2 2
9 1
70
6 10
#####
#      ##
#  #### ##
##      ##
# ## ##
#####
2 2
9 1
75
5 10
#####
#      #
#      #
#      #
#####
1 1
8 3
113
5 10
#####
#      #
#      #
#      #
#####
1 1
8 3
117
```

### Sample Output 1

```
:)
;(
:)
;(
:)
```