

Problem I

Problem : Turning Mirrors

Input File: mirrors.in
Output File: mirrors.out

It's 3000 years ago. The Pharaoh's pyramid has just been finished, and now the interior needs to be worked on. However, it's pitch dark inside, and the problem of providing light for the workers has to be solved.

Electric light hasn't been invented yet, and lighting a fire inside the pyramid isn't a good solution either, because the interior should stay clean of smoke and ash. Therefore, the senior architect's proposal is to use mirrors to redirect sunlight from the entrance to the construction sites. From time to time, after work had been finished at one place, the mirrors will have to be realigned in order to direct the light to another place. For this task of realigning the mirrors, an algorithm is needed. The input will be a two-dimensional map of one floor. The map displays the origin and the desired destination of the light, all obstacles and all mirrors, and the current path of the light. The output should be another map in which the mirrors are realigned appropriately (if necessary) so that the light reaches the destination.

As the Pharaoh's chief software engineer, it's your job to design this algorithm. The "computers" - a group of mathematically trained workers - will execute the program manually later. (Now you know why it took decades to build the pyramids.)

Input Specification

The input file consists of one or more test cases. Each test case starts with a line that contains two integers: the number of rows R and the number of columns C of the map. Then a map of the current situation follows, given as R rows of C characters each. The possible characters are 'O', 'D', '/', '\', '\', '\', '\', '+', '#', and '.'. They stand for:

O	origin of light
D	destination of light
/	mirror in position 1
\	mirror in position 2
#	obstacle
.	free space
	light ray moving vertically
-	light ray moving horizontally
+	crossing light rays

The origin of light 'O' will always be on the border. The remaining border will consist entirely of '#' characters. Light always travels vertically or horizontally, and reflections are always 90-degree turns.

Output Specification

For each test case, output the same map with the following two modifications:

- Turn mirrors where it is necessary, i.e. replace / by \ or vice versa.
- Redraw the light ray, i.e. change the characters |, -, + and . accordingly, so that it goes from O to D.

The characters O, D, and # always remain unchanged.



```
#####
# ..... / ..... D. #####
# ..... | .....
# ..... / ..... \
# ..... | ..... | .....
# ..... / ..... / .....
# ..... | ..... | .....
# ..... | ..... \ .....
# ..... / .....
#####O#####
```

```
#####
#D- / \
# . | .
#
#####O#####
```

Sample Output

```
0 0
#####
# ..... / ..... D. #####
# ..... | .....
# ..... \ .....
# ..... | ..... | .....
# ..... / ..... / .....
# ..... | ..... | .....
# ..... \ .....
# ..... / .....
#####O#####
```

```
11 49
#####
#D- \ -
# . | .
#
#####O#####
```

Sample Input

4 6