Problem J

Leveling Ground

It is important to first level the ground before you build anything on top of it (e.g., new house, shed, swimming pool, driveway, etc.), especially when there are hills on the land, otherwise whatever you built will not be stable. In case you don't understand, "leveling the ground" means making the ground flat and even (having the same height). In this problem, you are given a land description and the length of land – M – that you want to level; your task is to determine the minimum amount of land you should dispose in order to have a level land of length M. Note that in this problem you are only allowed to dispose land, not filling it.

The total length of the given land will be N, and the land will be encoded with the following format:

(1) / means ascending slope (disposing an ascending slope cost 0.5),
(2) \ means descending slope (disposing a descending slope cost 0.5),
(3) _ means flat (disposing a flat land cost 0),
(4) . means full land (disposing a full land cost 1).

Note that the input will only describe the land's surface, thus (4) will not appear in any input. Also note that (1) and (2) are not level.

For example, consider the following input.

```
Input  :  //__\_//\_\\\_/___\///__\\___/_
```

The input corresponds to the following land (which length is 31).

```
                 __    /\_             __
                /..\_/...\           /..\     _
Land   :       /..........\   ___   /....\___/.
               ............\_/...\/............
               ................................
Index  :       12345678901234567890123456789 01
```

Supposed we want to level a land of length M = 7, and for some reasons, we choose the land we want to level to be at index [11, 17]. Recall that you are only allowed to dispose land, thus if you want to level the land at [11, 17], you should level it such that the height is equal to the height of land at index 14 (because it is the lowest point). In the following figure, * (stars) mark the land which should be disposed.

```
                 __    /\_             __                __    /\_             __
                /..\_/...*           /..\     _          /..\_/...|           /..\     _
               /.........**   **_   /....\___/.         /.........|      _   /....\___/.
               .........*******.\/............         .........|_____|.\/............
               ................................         ................................
Index  :       12345678901234567890123456789 01         12345678901234567890123456789 01
```

If you observe, there are 12 stars in the left figure, they are:

- 1 ascending slope (at index: 15),
- 3 descending slopes (at indexes: 11, 12, and 13),
- 3 flat lands (at indexes: 14, 16, and 17), and
- 5 full lands (2 at index 11, 1 at index 12, 1 at index 16, and another 1 at index 17).

Therefore, the cost of leveling [11, 17] is: 1 * 0.5 + 3 * 0.5 + 3 * 0 + 5 * 1 = 7.

In this example, [11, 17] is not the best choice, you can do better.

Input

The first line of input contains T ($T \leq 50$) denoting the number of cases. Each case begins with two integers N and M ($1 \leq M \leq N \leq 1{,}000{,}000$) denoting the total length of the land and the length of the land which should be leveled respectively. The following line contains a string of length N describing the land's surface. The string will only contain character '/', '\', or '_', as described in the problem statement.

Output

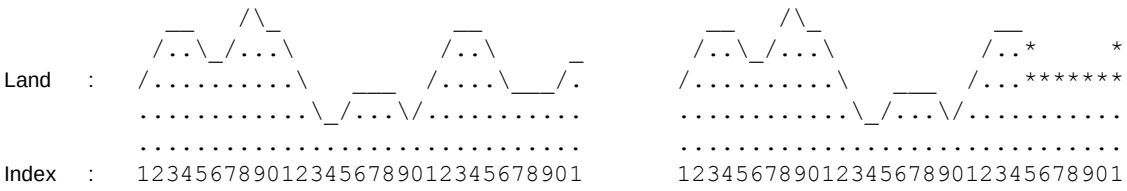
For each case, output "`Case #X: Y`", where `X` is the case number starts from 1 and `Y` is the minimum amount of land which should be disposed to achieve a level land which length is M for that particular case. Output this number with exactly one digit after the decimal point.

Warning: large input/output data, be careful with certain input-output routines.

Sample Input	Output for Sample Input
4 31 7 //___//__/___\///_____/_ 10 4 //_____\\/ 12 4 _//_/_\ 12 1 /\/\/\/\/\/\	Case #1: 3.5 Case #2: 0.0 Case #3: 1.0 Case #4: 0.5

Explanation for 1st sample case

This is the same case as the example in the problem statement. The minimum amount of land which you should dispose is 3.5. You can achieve this by leveling lands at [25, 31].



You will dispose: 1 ascending slope (at index 30), 2 descending slopes (at index 15 and 16), 4 flat lands (at index 27, 28, 29, and 31), and 2 full lands (at index 15 and 31). Therefore the total cost will be: 1 * 0.5 + 2 * 0.5 + 4 * 0 + 2 * 1 = 3.5.

Explanation for 2nd sample case

If you level the land at [3, 6] or [4, 7], you don't need to dispose any land as they are already level (have the same height).

Explanation for 3rd sample case

Level the land at [8, 11], and you only need to dispose 1 ascending slope and 1 descending slope.