

Kickstart Round B 2017

[A. Math Encoder](#)[B. Center](#)**C. Christmas Tree**[Questions asked](#)

Submissions

Math Encoder

7pt	Not attempted 820/920 users correct (89%)
16pt	Not attempted 411/802 users correct (51%)

Center

13pt	Not attempted 190/437 users correct (43%)
21pt	Not attempted 97/175 users correct (55%)

Christmas Tree

11pt	Not attempted 442/522 users correct (85%)
32pt	Not attempted 59/199 users correct (30%)

Top Scores

azure97	100
pps789	100
saffahyjp	100
wifi	100
Uhateme	100
BangBangBang	100
Tian.Xie	100
pwypeanut	100
mengrao	100
Doju	100

Problem C. Christmas Tree

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input
11 points

Solve C-small

Large input
32 points

Solve C-large

Problem

You are given a rectangular grid with **N** rows and **M** columns. Each cell of this grid is painted with one of two colors: green and white. Your task is to find the number of green cells in the largest Christmas tree in this grid.

To define a Christmas tree, first we define a **good triangle** as follows:

A good triangle with top point at row **R**, column **C** and height **h** ($h > 0$) is an isosceles triangle consisting entirely of green cells and pointing upward. Formally, this means that: The cell (**R**, **C**) is green, and for each **i** from 0 to **h-1** inclusive, the cells in row **R+i** from column **C-i** to column **C+i** are all green.

For example:

```
..#..
.####
#####
```

is a good triangle with height 3. The # cells are green and the . cells are white. Note that there is a green cell that is not part of the good triangle, even though it touches the good triangle.

```
..#..
.###.
####.
```

is **NOT** a good triangle with height 3, because the 5th cell in the 3rd row is white. However, there are good triangles with height 2 present.

```
...#.
.###.
#####.
```

is **NOT** a good triangle with height 3. However, there are good triangles with height 2 present.

A **K**-Christmas tree is defined as follows:

- It contains exactly **K** good triangles in vertical arrangement.
- The top cell of the **i+1**-th triangle must share its top edge with the bottom edge of any one of the cells at the base of the **i**-th triangle. This means that, if the base of the **i**-th triangle is at row **r**, from column **c1** to column **c2**, then the top of the **i+1**-th triangle must be on row **r+1**, in a column somewhere between **c1** and **c2**, inclusive.

For example, if **K** = 2:

```
...#...
..###..
.#####.
#####.
..#...
.###..
#####.
```

is a valid 2-Christmas tree. Note that the height of the 2 good triangles can be different.

```
..#..
.###.
.#...
```

is also a valid 2-Christmas tree. Note that a good triangle can be of height 1 and have only one green cell.

```
...#...
..###..
#####.
.....
..#...
.###..
#####.
```

The two good triangles with height 3 does **NOT** form a valid 2-Christmas tree, because the 2nd triangle must start from the 4-th row.

```
...#.
.###.
.#...
###..
```

The two good triangles with height 2 does **NOT** form a valid 2-Christmas tree, because the top of the 2nd triangle must be in a column between 3 and 5, inclusive.

You need to find the K-Christmas tree with the largest number of green cells.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each test case consists of three lines:

- The first line contains 3 space-separated integers **N**, **M** and **K**, where **N** is the number of rows of the grid, **M** is the number of columns of the grid and **K** is the number of good triangle in the desired Christmas tree.
- The next **N** lines each contain exactly **M** characters. Each character will be either **.** or **#**, representing a white or green cell, respectively.

Output

For each test case, output one line containing Case #x: y, where x is the test case number (starting from 1) and y is the number of green cells in the largest K-Christmas tree. If there is no K-Christmas tree, output 0.

Limits

$1 \leq T \leq 100$.

$1 \leq M \leq 100$.

$1 \leq N \leq 100$.

Each cell in the grid is either **.** or **#**.

Small dataset

K = 1.

Large dataset

$1 \leq K \leq 100$.

Sample

Input	Output
4	Case #1: 9
3 5 1	Case #2: 0
..#..	Case #3: 9
.###.	Case #4: 10
#####	
3 5 1	
.....	
.....	
.....	
4 5 1	
#####	
#####	
#####	
#####	
4 5 2	
#####	
#####	
#####	
#####	

In sample case #1, the largest 1-Christmas tree has 9 green cells:

```
..#..
.###.
#####
```

In sample case #2, there is no 1-Christmas tree.

In sample case #3, one largest 1-Christmas tree with 9 green cells is:

```
#####
#####
#####
#####
```

In sample case #4, one largest 2-Christmas tree with 10 green cells is:

```
#####
#####
#####
#####
```

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