# Pizza Pizza Pizza !!!

A city is a strip of ***1 × n*** square cells. In some cells there are Pizza delivery guys , some cells contain houses and remaining cells are empty.

A pizza delivery guy can move to a neighbouring cell in **1 unit** of time. If there is a house in the target cell then the delivery guy delivers all the pizzas ordered by that house. Delivery guy doesn't spend any time delivering any pizza.

In the initial moment of time all Pizza delivery guys begin to move left or right. Each Delivery guy can change direction of its movement(left or right) **any number of times**, but is not allowed to go beyond the boundaries of the city. Pizza delivery guys **do not interfere** with the movement of other delivery guys; in one cell there can be any number of delivery guys moving in any direction.

Your task is to determine **minimum** possible time after which Pizza delivery guys can deliver all the pizzas.

**Input Format**

Each test contains multiple test cases. The first line contains **T** — the number of test cases. Description of the test cases follows.

The first line of each test case contains a single integer ***n*** — the length of the city.

The second line of each test case contains the description of the city consisting of ***n*** symbols. If there is a symbol '**.**' in position ***i***, the cell ***i*** is empty. If there is symbol '*****' in position ***i***, the cell ***i*** contains a house. If there is a symbol '**P**' in position ***i***, the cell ***i*** is occupied by a pizza delivery guy.

It is guaranteed that in the city there is at least one Pizza delivery guy and at least one house.

**Constraints**

1 <= **T** <= 100

2 <= **N** <= 10^5

Note : Sum of **N** over all testcases doesn't exceed 10^5

**Output Format**

Print **minimum** possible time after which Pizza delivery guys can deliver all pizzas to respective houses.

**Sample Input 0**

```
2
7
*..P*P*
10
.**PP.*P.*
```

**Sample Output 0**

```
3
2
```

/

**Explanation 0**

In the first test case , Pizza delivery guy in position 4 will move to the left and will deliver pizza in position 1(house at position 1). He will spend 3 units of time on it. During the same 3 units of time, Pizza delivery guy in position 6 will deliver pizza to both of neighboring houses . For example, it can move to the left and deliver pizza in position 5 (in 1 time unit) and then move from position 5 to the right and deliver pizza to position 7 (in 2 time units). So in 3 time units Pizza delivery guys will deliver all the Pizzas in the city.

In the second test case, Pizza delivery guy in position 4 will move to the left and after 2 units of time will deliver pizza to positions 3 and 2. Pizza delivery guy in positions 5 and 8 will move to the right and in 2 units of time, will deliver pizza to positions 7 and 10, respectively. So 2 time units is enough for Delivery guys to deliver all the Pizzas.

**Sample Input 0**

```
2
12
P**.*P*P*P**
17
.*P*P**P**.**P...
```

**Sample Output 0**

```
3
3
```

/