String Inversions

Filename: `inversions`

Suppose we have a string of n lowercase letters. Let i and j represent two arbitrary indices in the string. An inversion is defined as a pair of integers i and j such that $i < j$ and the character in the string at position i is lexicographically greater than the character at position j. For example, "ab" has no inversions, "ba" has one inversion, and "baba" has three inversions. Given a string, can you count the number of inversions?

The Problem:

Count the number of inversions in a given string.

The Input:

The first line of the input file begins with a single, positive integer, t, representing the number of test cases. Each test case contains two lines. The first contains a single integer $1 \leq n \leq 10^5$, denoting the length of the string. The second line contains the string itself, which consists of only lowercase letters.

The Output:

For each test case, output a single line containing "`String #i: c`" without the quotes, where `i` is the test case number, and `c` is the number of inversions in the string.

Sample Input:

```
3
5
danny
4
lior
7
natalie
```

Sample Output:

```
String #1: 1
String #2: 1
String #3: 12
```