Sort the Fabrics

Problem

A fabric is represented by three properties:

- Color (C), a string consisting of lowercase letters of the English alphabet, representing the color of the fabric.
- Durability (D), an integer representing the durability of the fabric.
- Unique identifier (U), an integer representing the ID of the fabric.

Ada and Charles work at the Kick Start fabric factory. Each day they receive N fabrics, and one of them has to sort it. They sort it using the following criteria:

- Ada sorts in lexicographically increasing order by color (C).
- Charles sorts in ascending order by durability (D).
- They break ties by sorting in ascending order by the unique identifier (U).

Given N fabrics, count the number of fabrics which end up in the same position regardless of whether Ada or Charles sort them.

Input

The first line of the input gives the number of test cases, T. T test cases follow.
Each test case begins with one line consisting of an integer N denoting the number of fabrics.
Then N lines follow, each line with a string C_i, an integer D_i, and an integer U_i: the color, the durability and the unique identifier of the i-th fabric 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 fabrics which end up in the same position regardless of whether a worker sorts them by color or by durability.

Limits

Time limit: 20 seconds.
Memory limit: 1 GB.
$1 \leq T \leq 100$.
$1 \leq$ length of string $C_i \leq 10$.
String C_i consists of only lowercase letters of the English alphabet.
No two fabrics have same U_i.

Test Set 1

$1 \leq N \leq 2$.
$1 \leq D_i \leq 2$.
$1 \leq U_i \leq 2$.

Test Set 2

$1 \le N \le 10^3.$
$1 \le D_i \le 10^2.$
$1 \le U_i \le 10^3.$

Sample

Note: there are additional samples that are not run on submissions down below.

Sample Input	Sample Output
3 2 blue 2 1 yellow 1 2 2 blue 2 1 brown 2 2 1 red 1 1	Case #1: 0 Case #2: 2 Case #3: 1

In Sample Case #1, when sorted by color, the order of fabrics represented by the unique identifier is 1 and 2. When sorted by durability, the order of fabrics is 2 and 1. Therefore, 0 fabrics have the same position when sorted by color or durability.

In Sample Case #2, when sorted by color, the order of fabrics represented by the unique identifier is 1 and 2. When sorted by durability, the order of fabrics is also 1 and 2. Therefore, 2 fabrics have the same position. Notice that both fabrics have the same durability, so when Charles sorts them he decides that fabric 1 comes first because it has a smaller identifier.

In Sample Case #3, since there is only 1 fabric, the position remains the same whether the fabrics are sorted by color or durability.

Additional Sample - Test Set 2

The following additional sample fits the limits of Test Set 2. It will not be run against your submitted solutions.

Sample Input	Sample Output
1 5 blue 1 2 green 1 4 orange 2 5 red 3 6 yellow 3 7	Case #1: 5

In Sample Case #1, the order is the same for both when sorted by color or durability. So the answer is 5.