Ron likes to play with integers. Recently he is interested in a game where some integers are given and he is allowed to permute them. His **point** will be calculated from the permutation made by him. Ron knows that he will get as many candies as his **point**, so he wants to permute the numbers to maximize his **point**.

Say, Ron has got n integers $\{x_1, x_2, \ldots, x_n\}$ and $(x_{i1}, x_{i2}, \ldots, x_{in})$ is the permutation made by him. His **point** will be the sum of the *score* of all integers. The *score* of an individual number x_{iw} in that permutation is calculated by the length of the longest subsequence (Let us consider x_{j1}, x_{j2}, ..., x_{jm} as the subsequence where $1 \leq j_1 < j_2 < \ldots < j_m \leq n$) you can form with the following constraints:

1. There exists an integer k such that $1 \leq k \leq m$ and $j_k = i_w$.
2. $x_{j1} \leq x_{j2} \leq \ldots \leq x_{jk-1} \leq x_{jk} \geq x_{jk+1} \geq \ldots \geq x_{jm-1} \geq x_{jm}$.

Therefore, the *score* of x_{iw} in that permutation will be m. Say, $(1, 4, 3)$ is a permutation made by Ron using the numbers $\{1, 3, 4\}$. For this permutation, score of 1 is 1 with subsequence (1), score of 4 is 3 with subsequence (1, 4, 3) and score of 3 is 2 with subsequence (1, 3). So, Ron's point is 6 for this permutation.

Ron is not sure how to achieve the maximum **point** and he is also wondering about the number of different permutations which generate that maximum value of **point**. You need to help Ron to calculate these two values. A permutation $(x_1, x_2, \ldots, x_n)$ is different from another permutation $(y_1, y_2, \ldots, y_n)$ if there exists an integer i such that $1 \leq i \leq n$ and x_i is not equal to y_i.

Input

The first line of input contains a single integer T ($1 \leq T \leq 200$), which denotes the number of test cases to follow. For each test case, there will be two lines of input. The first line contains a single integer, p ($1 \leq p \leq 10^5$). The second line contains p pairs of integers. In each pair, there are two integers v_i and f_i ($1 \leq v_i, f_i \leq 10^5$) which indicate that the value v_i is present f_i times among the given numbers. Therefore, $f_1 + f_2 + \ldots + f_p = n$, where n is the total number of integers given to Ron. All the values of v_i will be distinct.

Output

For each case, in a separate line, print the case number and the maximum sum of scores and the number of permutations to achieve that sum of scores. As the number of permutations can be quite large, print it modulo 1000000007 ($10^9 + 7$). Follow Sample Input and Output for details. The value of the maximum sum of scores will fit in 64-bit unsigned integer.

Sample Input

```
2
2
121 1 22 1
2
71 2 35 1
```

Sample Output

```
Case 1: 3 2
Case 2: 7 2
```