1060 – nth Permutation

Given a string of characters, we can permute the individual characters to make new strings. At first we order the string into alphabetical order. Then we start permuting it.

For example the string **'abba'** gives rise to the following 6 distinct permutations in alphabetical order.

aabb 1
abab 2
abba 3
baab 4
baba 5
bbaa 6

Given a string, you have to find the **n**th permutation for that string. For the above case **'aabb'** is the 1st and **'baab'** is the 4th permutation.

Input

Input starts with an integer **T (≤ 200)**, denoting the number of test cases.

Each case contains a non empty string of lowercase letters with length no more than **20** and an integer **n (0 < n < 2^{31})**.

Output

For each case, output the case number and the **n**th permutation. If the **n**th permutation doesn't exist print **'Impossible'**.

Sample Input	Output for Sample Input
3 aabb 1 aabb 6 aabb 7	Case 1: aabb Case 2: bbaa Case 3: Impossible