Kick Start 2021 - Round E

Shuffled Anagrams

Problem

Let $\mathbf{S}$ be a string containing only letters of the English alphabet. An anagram of $\mathbf{S}$ is any string that contains exactly the same letters as $\mathbf{S}$ (with the same number of occurrences for each letter), but in a different order. For example, the word `kick` has anagrams such as `kcik` and `ckki`.

Now, let $S[i]$ be the i-th letter in $\mathbf{S}$. We say that an anagram of $\mathbf{S}$, A, is *shuffled* if and only if for all i, $S[i] \neq A[i]$. So, for instance, `kcik` is not a shuffled anagram of `kick` as the first and fourth letters of both of them are the same. However, `ckki` would be considered a shuffled anagram of `kick`, as would `ikkc`.

Given an arbitrary string $\mathbf{S}$, your task is to output any one shuffled anagram of $\mathbf{S}$, or else print `IMPOSSIBLE` if this cannot be done.

Input

The first line of the input gives the number of test cases, $\mathbf{T}$. $\mathbf{T}$ test cases follow. Each test case consists of one line, a string of English letters.

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 a shuffled anagram of the string for that test case, or `IMPOSSIBLE` if no shuffled anagram exists for that string.

Limits

Memory limit: 1 GB.
$1 \leq \mathbf{T} \leq 100$.
All input letters are lowercase English letters.

Test Set 1

Time limit: 20 seconds.
$1 \leq$ the length of $\mathbf{S} \leq 8$.

Test Set 2

Time limit: 40 seconds.
$1 \leq$ the length of $\mathbf{S} \leq 10^4$.

Sample

Sample Input	Sample Output

```
2
start
jjj
```

```
Case #1: tarts
Case #2: IMPOSSIBLE
```

In test case #1, `tarts` is a shuffled anagram of `start` as none of the letters in each position of both strings match the other. Another possible solution is `trsta` (though you only need to provide one solution). However, in test case #2, there is no way of anagramming `jjj` to form a shuffled anagram, so `IMPOSSIBLE` is printed instead.