Problem L
Lexicographically Minimum

As a perfectionist, Hanh is obsessed with ordering and rearranging things. When objects are not set up in the "correct" way, Hanh often experiences a feeling of discomfort and incompleteness. For example, Hanh gets very anxious when he sees a piece of C++ code with curly braces on a separate line, such as in the code below:

```
int main()
{
    string s; cin >> s;
    if (s != "")
    {
        cout << "Hello " << s << endl;
    }
}
```

Today Hanh received an endlessly long string. The string looks terrible: the string has some consecutive substrings with equal characters, and it is not even lexicographically minimum! This is terrible!! Please help Hanh reorder the string.

More formally, you are given a string S and an integer K. You must find a permutation S' of the string S such that:

- In S', there is no substrings of length K, where all characters are the same.
- Amongst all the strings satisfying the above condition, S' must be the lexicographically smallest one.

Note:

A string a is a substring of a string b if a can be obtained from b by deletion of several (possibly, zero or all) characters from the beginning and several (possibly, zero or all) characters from the end. For example, `abc` is a substring of `abcd`, but `abd` is not.

A string a is lexicographically smaller than a string b if and only if one of the following holds:

- a is a prefix of b, but $a \neq b$;
- in the first position where a and b differ, the string a has a letter that appears earlier in the alphabet than the corresponding letter in b.

Input

The first line of the input contains a single positive integer T – the number of test cases.

T test cases follow, each test case consists of 2 lines:

- In the first line, there is a non-empty string S with only lowercase English letters.
- In the second line, there is a positive integer K.

The sum of the length of all strings does not exceed 10^5. The sum of all K does not exceed 2×10^5.

Output

For each test case, print a single line containing the string S'. If there is no possible answer, print a single line containing the string `OH NO!`.

Sample Input 1	Sample Output 1
2 aabbccdd 2 aaa 2	ababcdcd OH NO!