J. Period

Time limit: 3s   Memory limit: 1536 MB

For each prefix of a given string **S** with **N** characters (each character has an ASCII code between 97 and 126, inclusive), we want to know whether the prefix is a periodic string. That is, for each **i** (2 <= **i** <= **N**) we want to know the largest **K** > 1 (if there is one) such that the prefix of **S** with length **i** can be written as A^K, that is **A** concatenated **K** times, for some string **A**. Of course, we also want to know the period **K**.

Input
The first line of the input file will contains only the number *T (1 <= T <= 10)* of the test cases.

Each test case consists of two lines. The first one contains **N** (2 <= **N** <= 1 000 000) – the size of the string **S**. The second line contains the string **S**.

Output
For each test case, output "Test case #" and the consecutive test case number on a single line; then, for each prefix with length **i** that has a period **K** > 1, output the prefix size **i** and the period **K** separated by a single space; the prefix sizes must be in increasing order. Print a blank line after each test case.

Example

```
Input:
2
3
aaa
12
aabaabaabaab

Output:
Test case #1
2 2
3 3

Test case #2
2 2
6 2
9 3
12 4
```

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