Problem A
Period

Input File: A.IN
Output File: standard output
Program Source File: A.PAS or A.C or A.CPP or A.JAVA

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 ($2 \leq i \leq N$) 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**.

The input file consists of several 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**. The input file ends with a line, having the number zero on it.

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	Output
3	Test case #1
aaa	2 2
12	3 3
aabaabaabaab	
0	Test case #2
	2 2
	6 2
	9 3
	12 4