# Baltic OI '04 P4 - Repeats

**Time limit:** 4.0s **Memory limit:** 512M

#### Baltic Olympiad in Informatics: 2004 Day 2, Problem 1

A string s is called a (k,l)-repeat if s is obtained by concatenating  $k \ge 1$  times some seed string t with length  $t \ge 1$ . For example, the string abaabaabaaba is a (4,3)-repeat with aba as the seed string. That is, the seed string aba is  $t \ge 1$  characters long, and the whole string  $t \ge 1$  is obtained by repeating it  $t \ge 1$ .

You are given a string u. Find one (k, l)-repeat s that occurs as a substring within u with a k as large as possible.

#### **Constraints**

 $1 \le n \le 5 \times 10^4$ 

 $\it u$  only consists of (a) or (b).

### **Input Specification**

The first line of input contains one integer n: the length of the input string u.

The next n lines describe the string u. Each line contains one character (either a or b).

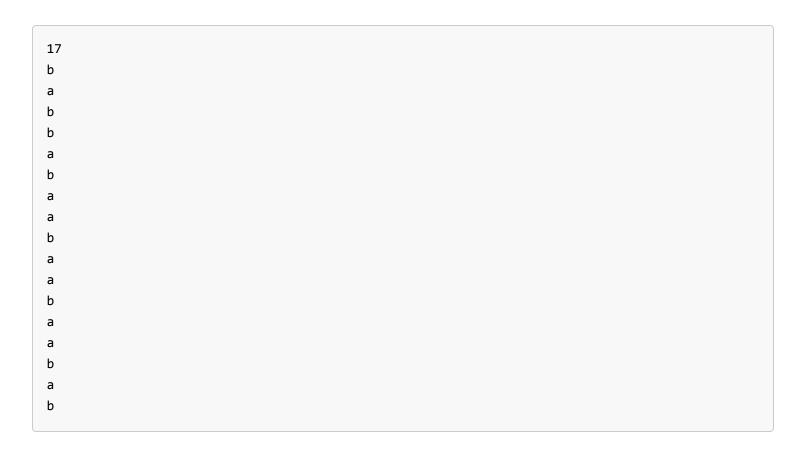
### **Output Specification**

Output three integers, each on its own line. They report the (k,l)-repeat your program found as follows:

- 1. The first line consists of the repeat count k that is maximized.
- 2. The second line consists of the length l of the seed string that is repeated k times.
- 3. The third and final line consists of the position p  $(1 \le p \le n)$  at which the (k, l)-repeat starts.

If there are multiple solutions with the same k, your program can output any one of them.

### Sample Input



## **Sample Output**

4 3 5

## **Sample Explanation**

A (4,3)-repeat is found starting at the  $5^{
m th}$  character of the input string (which is line 6 of the input file).

The underlined substring s of  $babb\underline{abaabaaba}$ b shows the (4,3)-repeat. No substring of u has more than 4 repeats.