IOI Training Camp 2011 – Test 7, 18 June, 2011

Problem 1 Security by Obscurity

To comply with government regulations, Raspberry has agreed to simplify the encryption scheme used on its network. Any piece of information transmitted over the Raspberry network is transformed into a string of characters made up of the lowercase letters `'a'`, `'b'`, ..., `'z'`. Most of the encrypted sequence is actually junk. The relevant contiguous substring that contains the real message is identified by its *rarity*.

The rarity of a string is defined as the number of elements that occur in it exactly once. For instance, in the input sequence `aabeape`, the rarity of the substring `aabe` is 2 while the rarity of the substring `bea` is 3. In this case, the maximum rarity among all contiguous substrings of `aabeape` is 4, which is achieved by `beap`.

Your task is relatively simple: you just have to write a program to compute the maximum rarity among all contiguous substrings of a given input string. This information will then be passed on to government "sleuths" to actually decrypt the text being transmitted on the Raspberry network. They are still working out how they can fruitfully use the information you supply, but this is their problem, not yours!

Input format

The first line of input is a single number N, the number of characters in the input string. The second line is a string of N letters made up of characters from the set {`'a'`,`'b'`,...,`'z'`}.

Output format

Your output should be a single integer, the maximum rarity among all contiguous substrings of the input string.

Test Data

- *Subtask 1 (30 marks):* $1 \leq N \leq 2000$.
- *Subtask 2 (70 marks):* $1 \leq N \leq 10^5$.

Sample input

```
7
aabeape
```

Sample output

```
4
```

Time and memory limits

The time limit for this task is 1 second. The memory limit is 32 MB.