Bear and Steady Gene

A gene is represented as a string of length n (where n is divisible by 4), composed of the letters A, C, T, and G. It is considered to be *steady* if each of the four letters occurs exactly $\frac{n}{4}$ times. For example, GACT and AAGTGCCT are both steady genes.

Bear Limak is a famous biotechnology scientist who specializes in modifying bear DNA to make it steady. Right now, he is examining a gene represented as a string s. It is not necessarily steady. Fortunately, Limak can choose one (maybe empty) substring of s and replace it with any substring of the same length.

Modifying a large substring of bear genes can be dangerous. Given a string s, can you help Limak find the length of the smallest possible substring that he can replace to make s a steady gene?

Note: A substring of a string S is a subsequence made up of zero or more *consecutive* characters of S.

Input Format

The first line contains an interger n divisible by 4, denoting the length of a string s.
The second line contains a string s of length n. Each character is one of the four: A, C, T, G.

Constraints

- $4 \le n \le 500\,000$
- n is divisible by 4

Subtask

- $4 \le n \le 2000$ in tests worth 30% points.

Output Format

On a new line, print the minimum length of the substring replaced to make s stable.

Sample Input

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8
GAAATAAA
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Sample Output

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5
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Explanation

One optimal solution is to replace a substring AAATA with TTCCG, resulting in GTTCCGAA. The replaced substring has length 5, so we print 5 on a new line.