



## Circular Palindromes



by shaka\_shadows

Problem

Submissions

Leaderboard

Discussions

A *palindrome* is a string that reads the same from left to right as it does from right to left.

Given a string,  $S$ , of  $N$  lowercase English letters, we define a  *$k$ -length rotation* as cutting the first  $k$  characters from the beginning of  $S$  and appending them to the end of  $S$ . For each  $S$ , there are  $N$  possible  $k$ -length rotations (where  $0 \leq k < N$ ). See the *Explanation* section for examples.

Given  $N$  and  $S$ , find all  $N$   $k$ -length rotations of  $S$ ; for each rotated string,  $S_k$ , print the maximum possible length of any palindromic substring of  $S_k$  on a new line.

### Input Format

The first line contains an integer,  $N$  (the length of  $S$ ).  
The second line contains a single string,  $S$ .

### Constraints

- $1 \leq N \leq 5 \times 10^5$
- $0 \leq k < N$
- $S$  is comprised of lowercase English letters.

### Output Format

There should be  $N$  lines of output, where each line  $k$  contains an integer denoting the maximum length of any palindromic substring of rotation  $S_k$ .

### Sample Input 0

```
13
aaaaabbbbbaaaa
```

### Sample Output 0

```
12
12
10
8
8
9
11
13
11
9
8
8
10
```

### Sample Input 1

```
7
cacbbba
```

### Sample Output 1

```
3
3
3
3
3
3
3
```

### Sample Input 2

```
12
eededdeededede
```

## Sample Output 2

Attempting to reconnect in ...

Reconnect

```
5
7
7
7
7
9
9
9
9
7
5
4
```

## Explanation

Consider *Sample Case 1*, where  $S = \text{"cacbbba"}$ .

The possible rotations,  $S_k$ , for string  $S$  are:

 $S_0 = \text{"cacbbba"}$ . $S_1 = \text{"acbbba"}$  $S_2 = \text{"cbbba"}$  $S_3 = \text{"bbba"}$  $S_4 = \text{"bbacac"}$  $S_5 = \text{"bacac"}$  $S_6 = \text{"acac"}$ 

The longest palindromic substrings for each  $S_k$  are:

 $S_0$ : "cac" and "bbb", so we print their length (3) on a new line. $S_1$ : "bbb", so we print its length (3) on a new line. $S_2$ : "bbb" and "aca", so we print their length (3) on a new line. $S_3$ : "bbb", "aca", and "cac", so we print their length (3) on a new line. $S_4$ : "aca" and "cac", so we print their length (3) on a new line. $S_5$ : "aca" and "cac", so we print their length (3) on a new line. $S_6$ : "aca", "cac", and "bbb", so we print their length (3) on a new line.

Submissions: 107

Max Score: 120

Difficulty: Advanced

[More](#)Current Buffer (saved locally, editable)  

C++



```
1 #include <cmath>
2 #include <cstdio>
3 #include <vector>
4 #include <iostream>
5 #include <algorithm>
6 using namespace std;
7
8
9 int main() {
10     /* Enter your code here. Read input from STDIN. Print output to STDOUT */
11     return 0;
12 }
13
```

Line: 1 Col: 1

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