***Maximum Increment***

C371\_Coding\_September2022

**Topic**: String

**Difficulty Level:** Easy

**Question / Problem Statement**:

Greyson has an integer variable **X**. Initially **X**=1.

Sergio gave Greyson a string **S** of length **N** and using the string **S** Greyson can perform the following operation **N** times. In the i-th operation, Greyson increments the value of **X** by 2 if ***S****i* = “a”, and decrements the value of **X** by 1 if ***S****i* = “d”.

Write a program to find the maximum value taken by **X** during the operations (including before the first operation, and after the last operation).

**Note**

An integer **X** initially 1.

**N** is always greater than 0.

String **S** only contains characters “a” or “d”.

**Function Description**

In the provided code snippet, implement the provided **maxIncrement(...)** method using the variables to print the maximum value taken by **X** during the operations. You can write your code in the space below the phrase **“WRITE YOUR LOGIC HERE”**.   
  
There will be multiple test cases running so the Input and Output should match exactly as provided.  
The base Output variable **result** is set to a default value of **-404** which can be modified. Additionally, you can add or remove these output variables.

**Input Format**

First line contains an integer **N**.

Second line contains a string **S**.

**Sample Input**

3 –denotes N.

aad –denotes S.

**Constraints**

1 <= **N** <= 100

-100 <= **X** <= 201

**Output Format**

Output should print the maximum value taken by **X** during the operations.

**Sample Output**

5

**Explanation**

Initially X=1.

Now traverse the string S from index 0 to N-1 :

For index-0: X becomes 3, since S*i = “*a*”*.

For index-1: X becomes 5, since S*i = “*a*”*.

For index-2: X becomes 4, since S*i = “*d*”*.

Thus, the output should be 5, the maximum value among all the values of X.

**Solution Steps**

1. Initialise **X** = 1 and traverse the string **S** and increment the value of **X** by 2 if S*i* = “a” and decrement the value of **X** by 1 if S*i* = “d” and every time maintain a variable mxm\_increment which stores the maximum value taken by **X** till now.

2. Finally return the mxm\_increment which is the answer.

**Running Solution in C++**

#include <bits/stdc++.h>

using namespace std;

int main(){

//Declare the N variable.

int N;

//Take N as input.

cin>>N;

//Declare the S variable.

string S;

//Take S as input.

cin>>S;

//Initialise X = 1.

int X=1;

//Initialise answer variable.

int mxm\_increment=1;

//Iterate the string S.

for(int idx=0;idx<N;idx++){

//check if S*i* = “a” or not.

if(S[idx]=='a')

X+=2;

//check if S*i* = “d” or not.

else

X-=1;

//updating the answer variable.

mxm\_increment=max(mxm\_increment,X);

}

cout<<mxm\_increment<<"\n";

}

Input:

5

ddddd

Output:

1

**Test Cases [Qty: 12]**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case No** | **Input** | **Output** | **Score** |
| 1 | 3  aad | 5 | 0 |
| 2 | 5  ddddd | 1 | 0 |
| 3 | 10  adadadadad | 7 | 1 |
| 4 | 15  aaaaaadddddddad | 13 | 1 |
| 5 | 7  adddada | 3 | 1 |
| 6 | 20  aaaaaddddddddddadada | 11 | 1 |
| 7 | 30  aaaaaaaaaaddddddddddadadadadad | 21 | 1 |
| 8 | 50  adadaaaaaaaaaaaaaaaaddddddddddadadadadadadadadaadd | 37 | 1 |
| 9 | 100  adaaaaaadadadadadadddddddaaaaaaaddddddddddddaaaaaaadadaaaaaaaaaaaaaaaaddddddddddadadadadadadadadaadd | 62 | 1 |
| 10 | 25  aaaaaddddddddddadadadadad | 11 | 1 |
| 11 | 1  a | 3 | 1 |
| 12 | 14  aaaaadddddddad | 11 | 1 |

Plagiarism found – No

Clarity of the problem statement - Yes

Clarity of the example in the problem statement - Yes

Clarity of sample test cases - Yes

Clarity of test cases (Dual output) – Yes

Clarity of explanations - Yes

Provided Solution running – Yes

EEOC complaint (using abusive words/Indian Names/) - No

Similar Question in System - No

Difficulty Level – Easy

Question w.r.t strings concepts- Yes

Final Comment: **Accepted**