Power of a String

n-2

str = " aaabbbbbcccddddddaaaaaaa

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

i

len = ~~1~~ ~~2~~ ~~3~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~1~~ ~~2~~ ~~3~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ 7

ans = ~~-∞~~ ~~3~~ ~~5~~ 6

psudo code

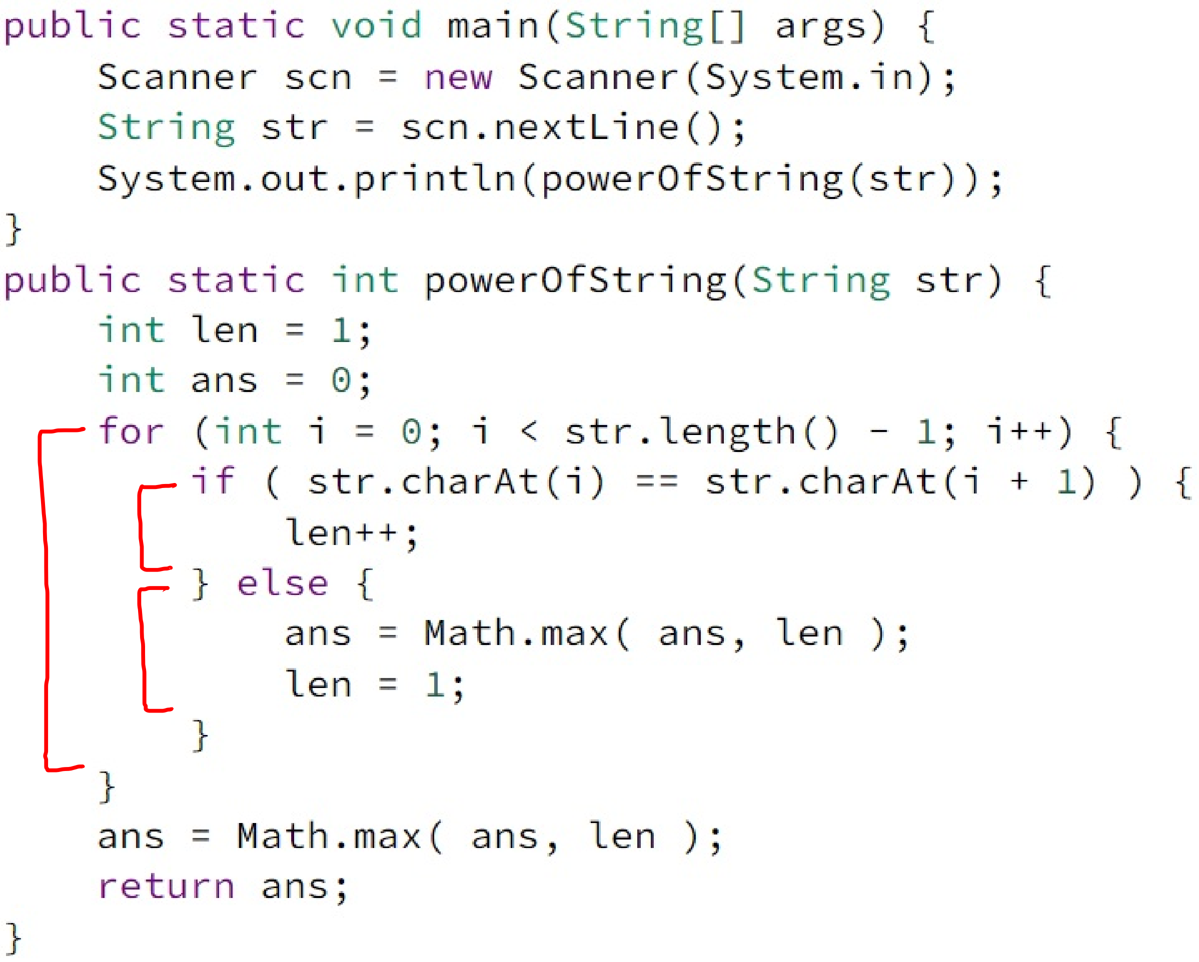
```
1) if char at (i) == char at (i+1)
        len++;

2) else
        2.1) store best answer somewhere
        2.2) and reset the value of len
```

code

T.C = O(N), S.C = O(1)

len of str



```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    String str = scn.nextLine();
    System.out.println(powerOfString(str));
}
public static int powerOfString(String str) {
    int len = 1;
    int ans = 0;
    for (int i = 0; i < str.length() - 1; i++) {
        if ( str.charAt(i) == str.charAt(i + 1) ) {
            len++;
        } else {
            ans = Math.max( ans, len );
            len = 1;
        }
    }
    ans = Math.max( ans, len );
    return ans;
}
```

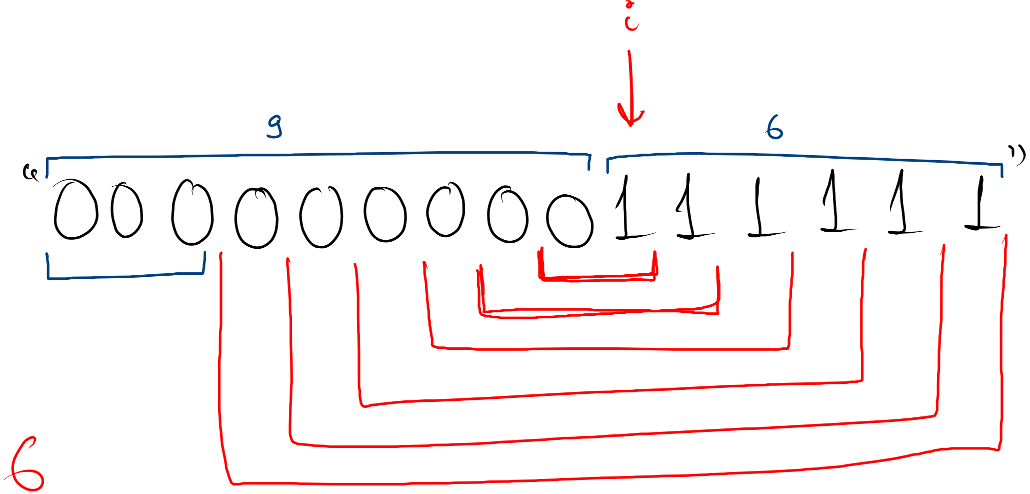
Count Substring of 0 and 1

- counting of 0's and 1's should be same
- all 0's and all 1's should be together

$$str = "\underbrace{0000}_{4}\underbrace{11}_{2}\underbrace{000}_{3}\underbrace{11111}_{5}" ;$$

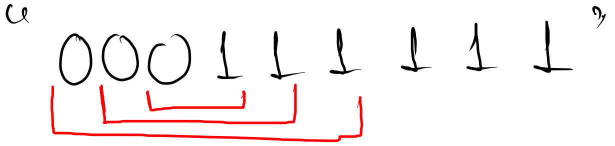
$$ans = 2 + 2 + 3$$
$$= 7$$

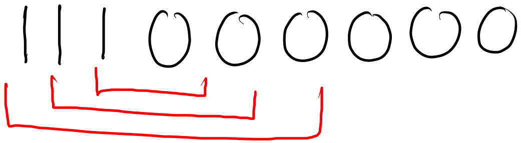
str = "000000000111111"



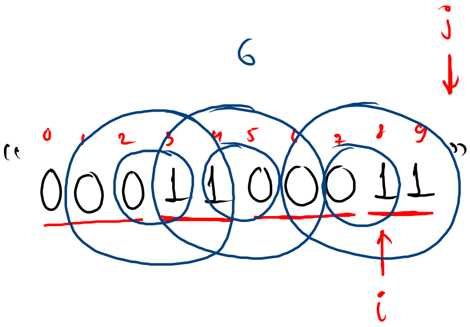
ans = 6

countZero = ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~8~~ 9





```
public static int countSubstring(String str) {
    int n = str.length();
    int i = 0;
    int ans = 0;
    while ( i < n ) {
        int countZero = 0;
        int countOne = 0;
        if ( str.charAt(i) == '0' ) {
            while ( i < n && str.charAt(i) == '0' ) {
                countZero++;
                i++;
            }
            int j = i;
            while ( j < n && str.charAt(j) == '1' ) {
                countOne++;
                j++;
            }
        } else {
            while ( i < n && str.charAt(i) == '1' ) {
                countOne++;
                i++;
            }
            int j = i;
            while ( j < n && str.charAt(j) == '0' ) {
                countZero++;
                j++;
            }
        }
        ans = ans + Math.min( countZero, countOne );
    }
    return ans;
}
```



CountZero = ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~0~~ ~~1~~ ~~2~~ 3

count One = ~~0~~ ~~1~~ ~~2~~ ~~0~~ ~~1~~ ~~2~~ ~~0~~ ~~1~~ 2

ans = 0 + 2 + 2 + 2

= 6

T.C = 2 * N

≅ O(N)