

## Talent Battle 100 Days Coding Series

You are given a binary string  $S$  of length  $N$ . You can perform the following operation on  $S$ :

- Pick any set of indices such that no two picked indices are adjacent.
- Flip the values at the picked indices (i.e. change 0 to 1 and 1 to 0).

For example, consider the string  $S=1101101$ .

If we pick the indices  $\{1,3,6\}$ , then after flipping the values at picked indices, we will get 11011011.  
 $1 \rightarrow 0$ 111111.

Note that we cannot pick the set  $\{2,3,5\}$  since 2 and 3 are adjacent indices.

Find the **minimum** number of operations required to convert **all** the characters of  $S$  to 0.

### Input Format

- The first line contains a single integer  $T$  - the number of test cases. Then the test cases follow.
- The first line of each test case contains an integer  $N$  - the length of the binary string  $S$ .
- The second line of each test case contains a binary string  $S$  of length  $N$ .

### Output Format

For each test case, output the **minimum** number of operations required to convert all the characters of  $S$  to 0.

### Sample Input

```
3
6
101001
5
00000
3
111
```

### Sample Output

```
1
0
2
```

C

```
#include <stdio.h>
```

```
int main(void) {
```

```
    int t;
```

```
    scanf("%d",&t);
```

```
    while(t--){
```

```
        int n,i,j,p=0,q=0;
```

```
        scanf("%d",&n);
```

```
        char s[n];
```

```
        scanf("\n");
```

```
        gets(s);
```

```
        for(i=0;i<n;i++){
```

```
            if(s[i]=='1') q+=1;
```

```
        }
```

```
        if(q==0) printf("0\n");
```

```
        else if(q==1) printf("1\n");
```

```
        else{
```

```
            for(i=0;i<n-1;i++){
```

```
                if(s[i]=='1'&& s[i+1]=='1') {
```

```
                    p=1;
```

```
                    break;
```

```
                }
```

```
            }
```

```
            if(p==0) printf("1\n");
```

```
            else printf("2\n");
```

```
        }
```

```
    }
```

```
    return 0;
```

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```
}
```

### C++

```
#include<bits/stdc++.h>
```

```
using namespace std;
```

```
int main(){
```

```
int t,N,i;
```

```
string s;
```

```
cin>>t;
```

```
while(t--){
```

```
    cin>>N;
```

```
    cin>>s;
```

```
    for(i=0;i<N;++i)if(s[i]=='1')break;
```

```
    if(i==N){
```

```
        cout<<0<<endl;
```

```
        continue;
```

```
    }
```

```
    else{
```

```
        for(i=1;i<N;++i)if(s[i]=='1'&& s[i-1]=='1')break;
```

```
        if(i==N)cout<<1<<endl;
```

```
        else cout<<2<<endl;
```

```
    }
```

```
}
```

```
return 0;
```

```
}
```

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### Java

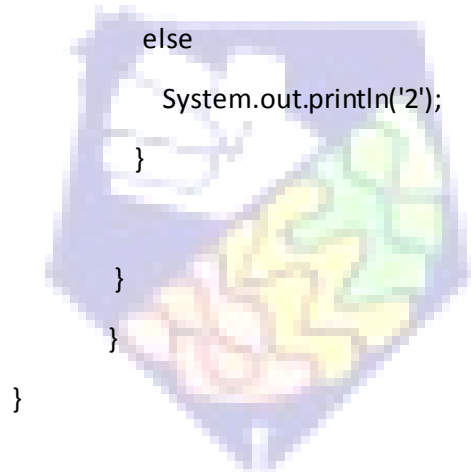
```
import java.util.*;
import java.lang.*;
import java.io.*;
class Main
{
    public static void main (String[] args) throws java.lang.Exception
    {
        Scanner in=new Scanner(System.in);
        int T=in.nextInt();
        for(int i=0;i<T;i++)
        {int count=0,t=0;
            int n=in.nextInt();
            String s=in.next();

            for(int j=0;j<s.length()-1;j++)
            {

                if(s.charAt(j)=='1')
                {
                    count++;
                    if(s.charAt(j)==s.charAt(j+1))
                        t++;
                }
            }
            if(s.charAt(s.length()-1)=='1'&& count==0 )
            {
                System.out.println('1');
```

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```
        continue;
    }
    if(count==0)
    {
        System.out.println('0');
    }
    else
    {
        if(t==0)
            System.out.println('1');
```



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### Python

```
T = int(input())
for i in range(T):
    N = int(input())
    S = list(input())
    count = 0
    while(S.count('1')!=0):
        cnt = 0
        t = 0
        for i in range(N):
```

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```
if(t==1):  
    t = 0  
    continue  
elif(S[i]=='1'):  
    cnt += 1  
    S[i]='0'  
    t = 1  
if(cnt!=0):  
    count += 1  
print(count)
```



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