**Wifi Range :-**

Easy Accuracy: 51.63% Submissions: 30K+ Points: 2

There are **N** rooms in a straight line in Geekland State University's hostel, you are given a binary string **S** of length **N** where **S[i] = '1'** represents that there is a wifi in **ith** room or **S[i] = '0'** represents no wifi. Each wifi has range **X** *i.e.* if there is a wifi in ith room then its range will go upto **X** more rooms on its left as well as right. You have to find whether students in all rooms can use wifi.

**Example 1:**

**Input:**

N = 3, X = 0

S = "010"

**Output:**

0

**Explanation**:

Since the range(X)=0, So Wifi is only

accessible in second room while 1st & 3rd

room have no wifi.

**Example 2:**

**Input:**

N = 5, X = 1

S = "10010"

**Output:**

1

**Explanation**:

Index 0 : Wifi is available

Index 1 : Since range of 0th Index is 1

  so, here wifi will be available.

Index 2 : Since range of 3rd Index is 1

  so, here also wifi available.

Index 3 : Wifi is available

Index 4 : here range of 3rd Index is available.

So all the rooms have wifi, so return true.

**Your Task:**  
You don't need to read input or print anything. Your task is to complete the function **wifiRange( )** which takes integer **N**, string **S** and integer **X** as input parameters and returns true if students in all rooms can use wifi or false otherwise.

**Expected Time Complexity**:O(N)  
**Expected Space Complexity**:O(1)

**Constraints:**  
1 ≤ N ≤ 106  
0 ≤ X ≤ 106

**Code :-**

//{ Driver Code Starts

//Initial Template for C++

#include <bits/stdc++.h>

using namespace std;

// } Driver Code Ends

//User function Template for C++

class Solution{

public:

bool wifiRange(int N, string S, int X){

int c0=0, f1=false;

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

if(S[i]=='0') c0++;

else{

if(f1==false && c0>X) return 0;

else if(f1==true && c0 > 2\*X) return 0;

c0=0;

f1=true;

}

}

if(c0<=X && f1==true) return 1;

else return 0;

}

};

//{ Driver Code Starts.

int main(){

int T;

cin >> T;

while(T--){

int N, X;

string S;

cin >> N >> X >> S;

Solution obj;

cout << obj.wifiRange(N, S, X) << "\n";

}

}

// } Driver Code Ends

**Logic :-**

Here, the basic logic that is used = Uptill first & last occurence of '1' if the count of '0'>X (or wifi range), then the answer is FALSE. Or, if the count of '0' between any two '1' is greater than 2\*X (or wifi range), then our answer is FALSE. Else, in every case the answer is TRUE.

Here, c0=count of '0',

f1=whether '1' is found

N = Length of string

S = given string

X = given wifi range