6. Write a C program to check whether a given string belongs to the language defined by a Context Free Grammar (CFG)

S → 0S1 | ε

#include<stdio.h>

#include<string.h>

int main()

{

char s[100];

int i,flag,flag1,flag2;

int l;

printf("enter a string to check:");

scanf("%s",s);

l=strlen(s);

flag=1;

for(i=0;i<l;i++)

{

if(s[i]!='0' && s[i]!='1')

{

 flag=0;

}

}

if(flag!=1)

printf("string is Not Valid\n");

if(flag==1)

{

if(l%2!=0) // If string length is odd

 {

 printf("The string does not satisfy the condition 0n1n\n");

 printf("String Not Accepted\n");

 }

else

{

// To check first half contains 0s

flag1=1;

for(i=0;i<(l/2);i++)

{

if(s[i]!='0')

{

flag1=0;

}

}

// To check second half contains 1s

flag2=1;

for(i=l/2;i<l;i++)

{

if(s[i]!='1')

{

flag2=0;

}

}

if(flag1==1 && flag2==1)

 {

 printf("The string satisfies the condition 0n1n\n");

 printf("String Accepted\n");

 }

else

 {

 printf("The string does not satisfy the condition 0n1n\n");

 printf("String Not Accepted\n");

 }

}

}

}

Output:

