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

**S → 0S0 | 1S1 | 0 | 1 | ε**

**AIM :** To Write a C program to check whether a given string belongs to the language defined by a Context Free Grammar (CFG)

S → 0S0 | 1S1 | 0 | 1 | ε

**CODE :**

#include <stdio.h>

#include <string.h>

int is\_valid\_string(char \*input);

int main() {

char input[100];

printf("Enter a string: ");

scanf("%s", input);

if (is\_valid\_string(input)) {

printf("The string \"%s\" belongs to the CFG.\n", input);

} else {

printf("The string \"%s\" does not belong to the CFG.\n", input);

}

return 0;

}

int is\_valid\_string(char \*input) {

int length = strlen(input);

if (length == 0) {

return 1;

}

if (length == 1) {

if (input[0] == '0' || input[0] == '1') {

return 1;

} else {

return 0;

}

}

if (input[0] == '0' && input[length - 1] == '0') {

int i = 1;

while (i < length - 1 && input[i] == '0') {

i++;

}

if (i == length - 1) {

return is\_valid\_string(&input[1]);

}

}

if (input[0] == '1' && input[length - 1] == '1') {

int i = 1;

while (i < length - 1 && input[i] == '1') {

i++;

}

if (i == length - 1) {

return is\_valid\_string(&input[1]);

}

}

return 0;

}

**OUTPUT :**



