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

**S → A101A, A → 0A | 1A | ε**

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

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**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 < 4 || input[0] == '0' || input[length-1] == '0' || input[length-2] == '0') {

return 0;

}

int i = 0;

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

i++;

}

if (i == 0 || i == length - 3) {

return 0;

}

while (i < length - 2 && input[i] == '0') {

i++;

}

if (i == length - 2) {

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

}

if (input[i] == '1') {

return is\_valid\_string(&input[i+1]) && is\_valid\_string(&input[length-2]);

}

return 0;

}

**OUTPUT :**

