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

S → 0A1 A → 0A | 1A | ε

#include <stdio.h>

#include <stdbool.h>

#include <string.h>

// Function to check if a string belongs to the language of CFG A

bool isA(char \*str, int start, int end) {

if (start > end) {

return true; // Base case: epsilon belongs to A

}

if (str[start] == '0') {

return isA(str, start + 1, end);

} else if (str[start] == '1') {

return isA(str, start + 1, end);

}

return false;

}

// Function to check if a string belongs to the language of CFG S

bool belongsToLanguage(char \*str, int start, int end) {

if (start == end) {

return false; // Minimum length requirement for S

}

if (str[start] == '0' && str[end] == '1') {

return isA(str, start + 1, end - 1);

}

return false;

}

int main() {

char input[100];

printf("Enter a string: ");

scanf("%s", input);

if (belongsToLanguage(input, 0, strlen(input) - 1)) {

printf("String belongs to the language.\n");

} else {

printf("String does not belong to the language.\n");

}

return 0;

}