4.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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Program:

#include <stdio.h>

#include <string.h>

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

if (start > end) {

return 1;

}

if (start == end) {

return (str[start] == '0' || str[start] == '1');

}

int i, j;

for (i = start; i <= end; ++i) {

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

return 0;

}

}

for (i = start + 1; i <= end - 1; ++i) {

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

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

if (belongsToLanguage(str, start + 1, i - 1) && belongsToLanguage(str, i + 1, end - 1)) {

return 1;

}

}

}

return 0;

}

int main() {

char input[100];

printf("Enter a string: ");

scanf("%s", input);

int length = strlen(input);

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

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

} else {

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

}

return 0;

}