

BIL105E

Introduction to Scientific and Engineering Computation

CRN: 21831

Student Name: Mustafa Efehan PEKEL

Student Number: 150140050

Homework 3

Implementing some character sequences (i.e., string) operations
by using pointers and functions.

Lecturer's Name: Ahmet Cüneyd Tantı

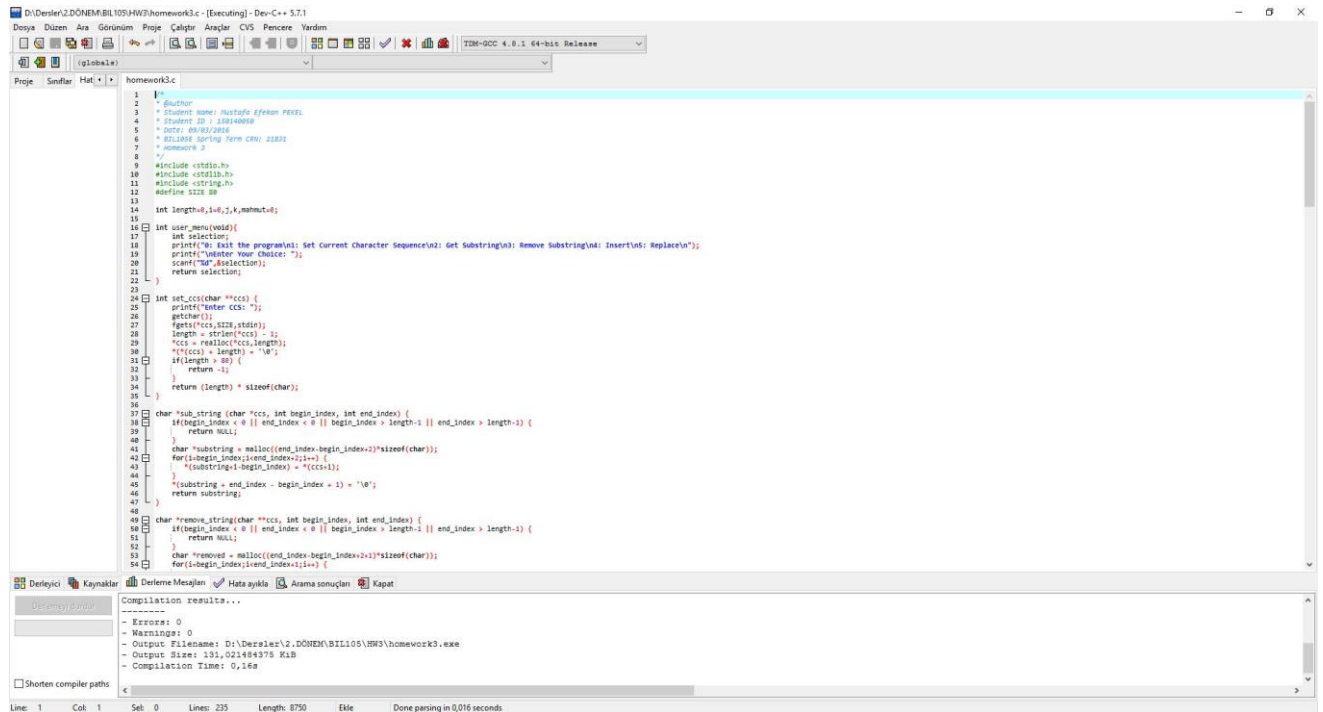
Date of Submission: 01.05.2016

1. Introduction Section

The homework want us to implement some character sequence (i.e., string) operations by using pointers and functions. A menu is presented to the user and the selected operation is executed on a character sequence.

2. Development Environment

My homework has one C file 150140050.c. The application is written on a Microsoft Windows 10 machine with using Dev-C++ 5.7.1 program and TDM-GCC 4.8.1 64-bit Release compiler. Then the program tested in both Windows and Linux Ubuntu distribution. Then finally compiled at ITU SSH server successfully. I compiled my homework with CodeBlocks on Windows. I compiled my homework using Terminal by the command gcc homework3.c -o homework3.out



```
1 //
2 * Author
3 * Student Name: Mustafa Efehan PEREL
4 * Student ID : 150140050
5 * Date: 09/03/2016
6 * Bilkent Spring Term CMI: 22831
7 * homework 3
8
9 #include <stdio.h>
10 #include <stdlib.h>
11 #include <string.h>
12 #define SIZE 80
13
14 int length=0,i,j,k,m,n,mu,tu;
15
16 int user_menu(void){
17     int selection;
18     printf("\n Isit the program\n1: Set Current Character Sequence\n2: Get Substring\n3: Remove Substring\n4: Insert\n5: Replace\n");
19     printf("\nEnter Your Choice: ");
20     scanf("%d",&selection);
21     return selection;
22 }
23
24 int set_ccs(char **ccs){
25     printf("Enter CCS: ");
26     getche();
27     gets(ccs,SIZE,stdin);
28     length = strlen(ccs) - 1;
29     *ccs = realloc(ccs,length);
30     *(ccs) + length = '\0';
31     if(length > 0){
32         return -1;
33     }
34     return (length) * sizeof(char);
35 }
36
37 char *sub_string(char *ccs, int begin_index, int end_index){
38     if(begin_index < 0 || end_index < 0 || begin_index > length-1 || end_index > length-1){
39         return NULL;
40     }
41     char *substring = malloc((end_index-begin_index+2)*sizeof(char));
42     for(i=begin_index;i<end_index+2;i++){
43         *(substring+i-begin_index) = *(ccs+i);
44     }
45     *(substring + end_index - begin_index + 1) = '\0';
46     return substring;
47 }
48
49 char *remove_string(char **ccs, int begin_index, int end_index){
50     if(begin_index < 0 || end_index < 0 || begin_index > length-1 || end_index > length-1){
51         return NULL;
52     }
53     char *removed = malloc((end_index-begin_index+2)*sizeof(char));
54     for(i=begin_index;i<end_index+2;i++){
```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\Devzlex\2.DONEM\BIL105\HW3\homework3.exe
- Output Size: 131,021484975 KiB
- Compilation Time: 0,14s

Line: 1 Col: 1 Sel: 0 Lines: 235 Length: 8750 Ekile Done parsing in 0,016 seconds

```
D:\Dersler\2.D\NEM\BIL105\HW3\homework3.exe
0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2

You have to set Current Character Sequence (CCS) before doing any operations!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 1
Enter CCS: A man, a plan, a canal, Panama!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2
Enter the BEGIN INDEX and END INDEX numbers: 2 6

CCS:"A man, a plan, a canal, Panama!"
Substring(2,6): "man, "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 3
Enter the BEGIN INDEX and END INDEX numbers: 2 8
CCS:"A plan, a canal, Panama!"
Removed String(2,8): "man, a "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 4
Enter a new string for insertion: man, a
Enter the BEGIN INDEX number where the new string begins:2
CCS:"A man, a plan, a canal, Panama!"

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 5
Find what: A
Replace with: One
There were 1 replacement.
CCS:"One man, a plan, a canal, Panama!"

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 0

Goodbye!
-----
Process exited after 244.2 seconds with return value 9
Press any key to continue . . .
```

```
efekan@ubuntu: ~/Desktop/homework3
0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2

You have to set Current Character Sequence (CCS) before doing any operations!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 1
Enter CCS: A man, a plan, a canal, Panama!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2
Enter the BEGIN INDEX and END INDEX numbers: 2 6

CCS:"A man, a plan, a canal, Panama!"
Substring(2,6): "man, "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 3
Enter the BEGIN INDEX and END INDEX numbers: 2 8
CCS:"A plan, a canal, Panama!"
Removed String(2,8): "man, a "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 4
Enter a new string for insertion: man, a
Enter the BEGIN INDEX number where the new string begins:2
CCS:"A man, a plan, a canal, Panama!"
```

```
ssh.itu.edu.tr - default - SSH Secure Shell
File Edit View Window Help
[Icons] Quick Connect Profiles

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2

You have to set Current Character Sequence (CCS) before doing any operations!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 1
Enter CCS: A man, a plan, a canal, Panama!

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 2
Enter the BEGIN INDEX and END INDEX numbers: 2 6

CCS:"A man, a plan, a canal, Panama!"
Substring(2,6): "man, "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 3
Enter the BEGIN INDEX and END INDEX numbers: 2 8
CCS:"A plan, a canal, Panama!"
Removed String(2,8): "man, a "

0: Exit the program
1: Set Current Character Sequence
2: Get Substring
3: Remove Substring
4: Insert
5: Replace

Enter Your Choice: 4
Enter a new string for insertion: man, a
Enter the BEGIN INDEX number where the new string begins:2
CCS:"A man, a plan, a canal, Panama!"

0: Exit the program
1: Set Current Character Sequence
2: Get Substring

Connected to ssh.itu.edu.tr SSH2 - aes128-cbc - hmac-md5 - n 148x61 NUM
```

3. Data Structures and Variables

Homework uses three library which are `stdio.h`, `stdlib.h`, `string.h`.

`length`: length of current character set

`length_insert`: length of insertion string

`selection`: selection of user to choose operation

`begin_index`: starting index

`end_index`: last index

replacement: the number of replacements

length_find: the length of find string

length_replace: the length of replace string

*substring: the product of sub_string function

*removed: the part of ccs to remove which is user's input

*insert: the addition part to ccs which is user's input

*find: user's input string to find in ccs

*replace: user's input string to replace with *find in ccs

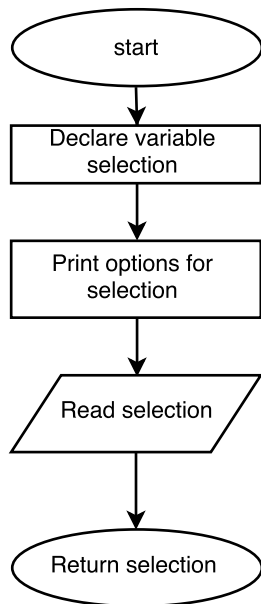
4. Conclusions

I used if-else statements, strings, functions, pointers, dynamic memory allocation operations(malloc, free, realloc) , while and for loops. It was good practice to learn strings and dynamic memory allocation operations. Owing to homework, I saw a lot of my mistakes. I learn dynamic memory allocations.

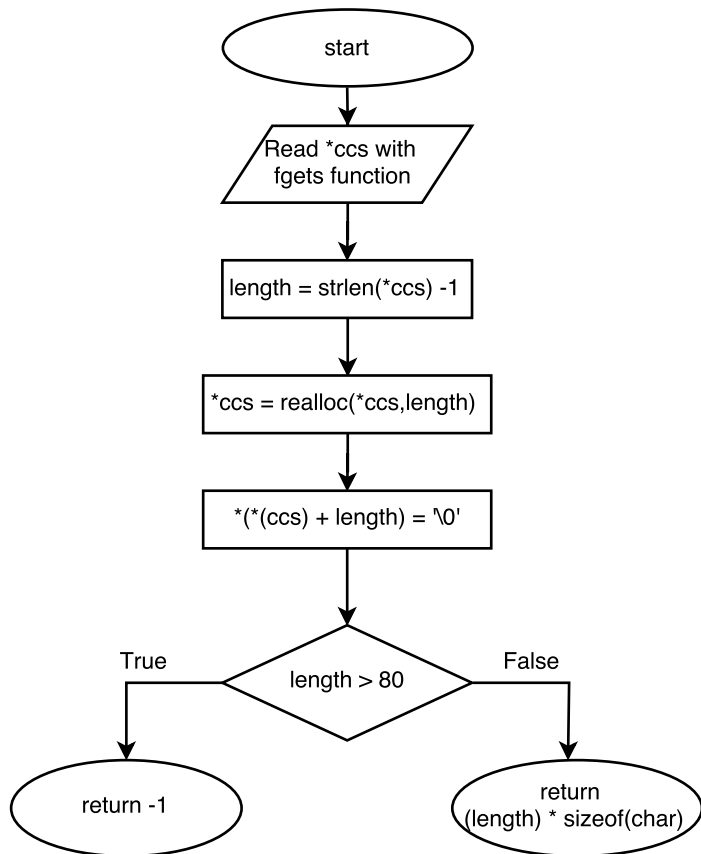
5. Program Flow

My program flow:

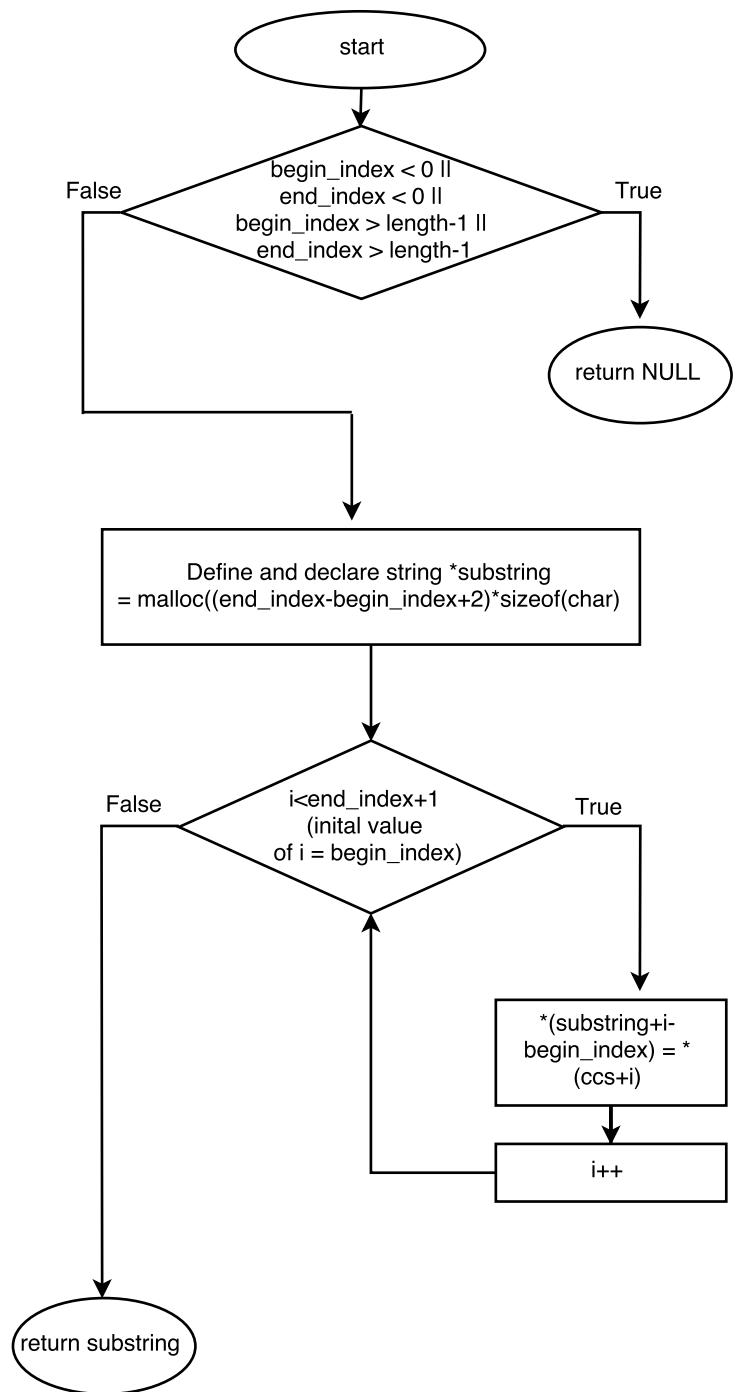
Flowchart: user_menu(void)



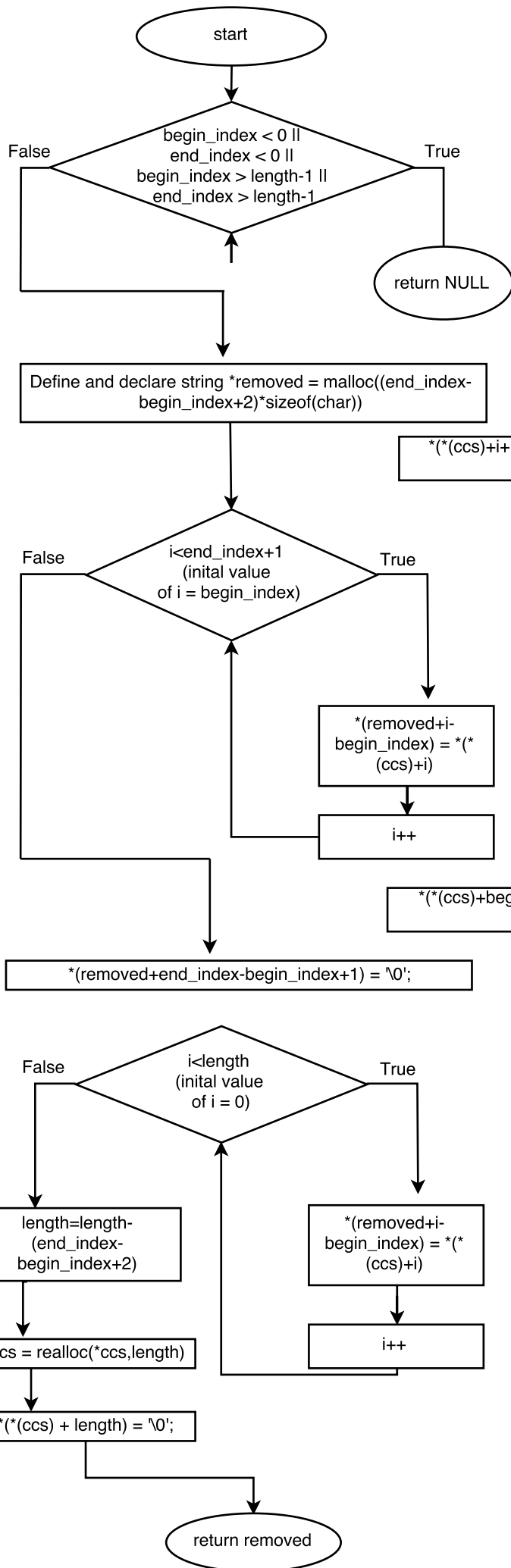
Flowchart: set_ccs(char **ccs)



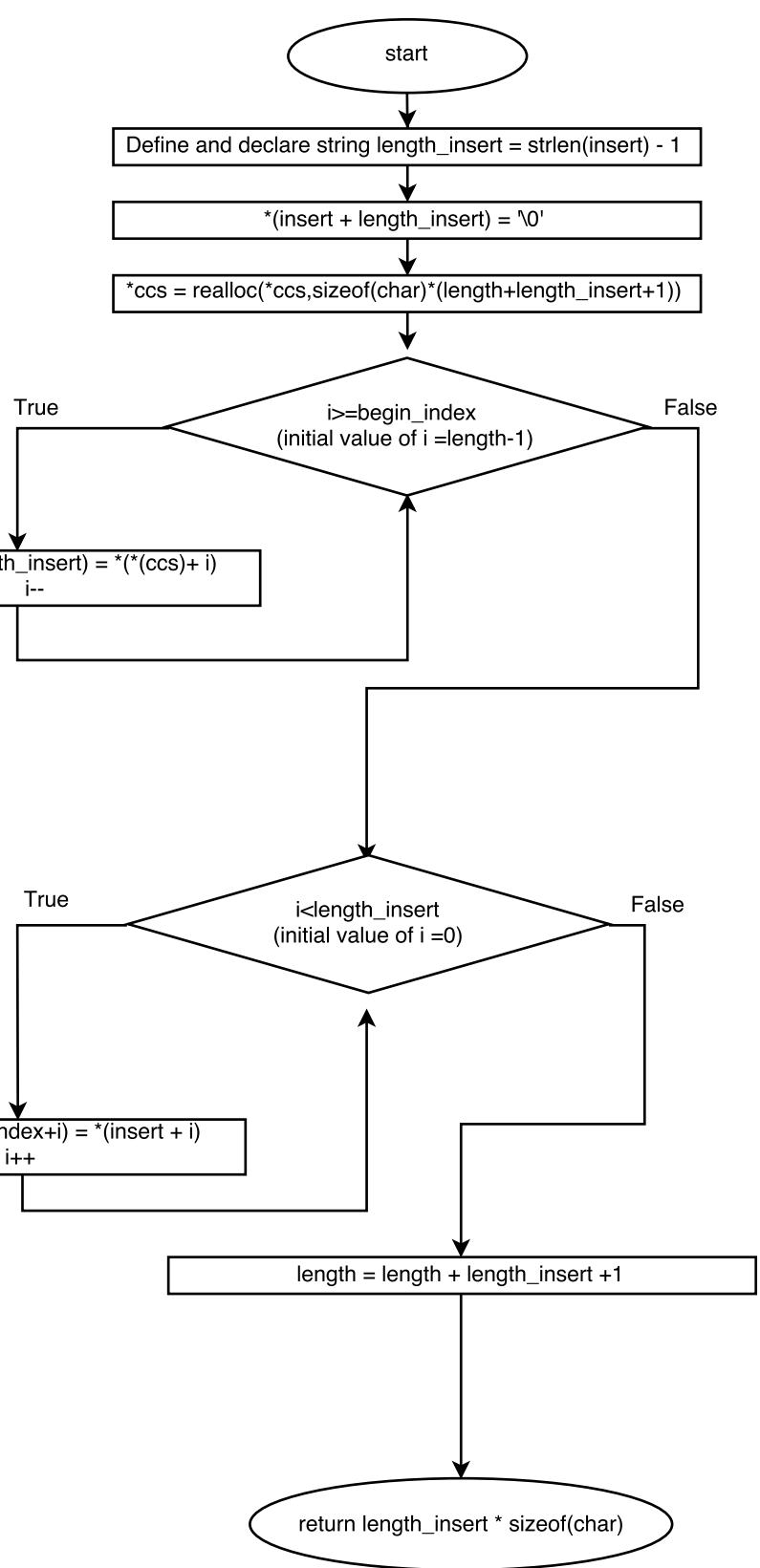
Flowchart: sub_string (char *ccs, int begin_index, int end_index)



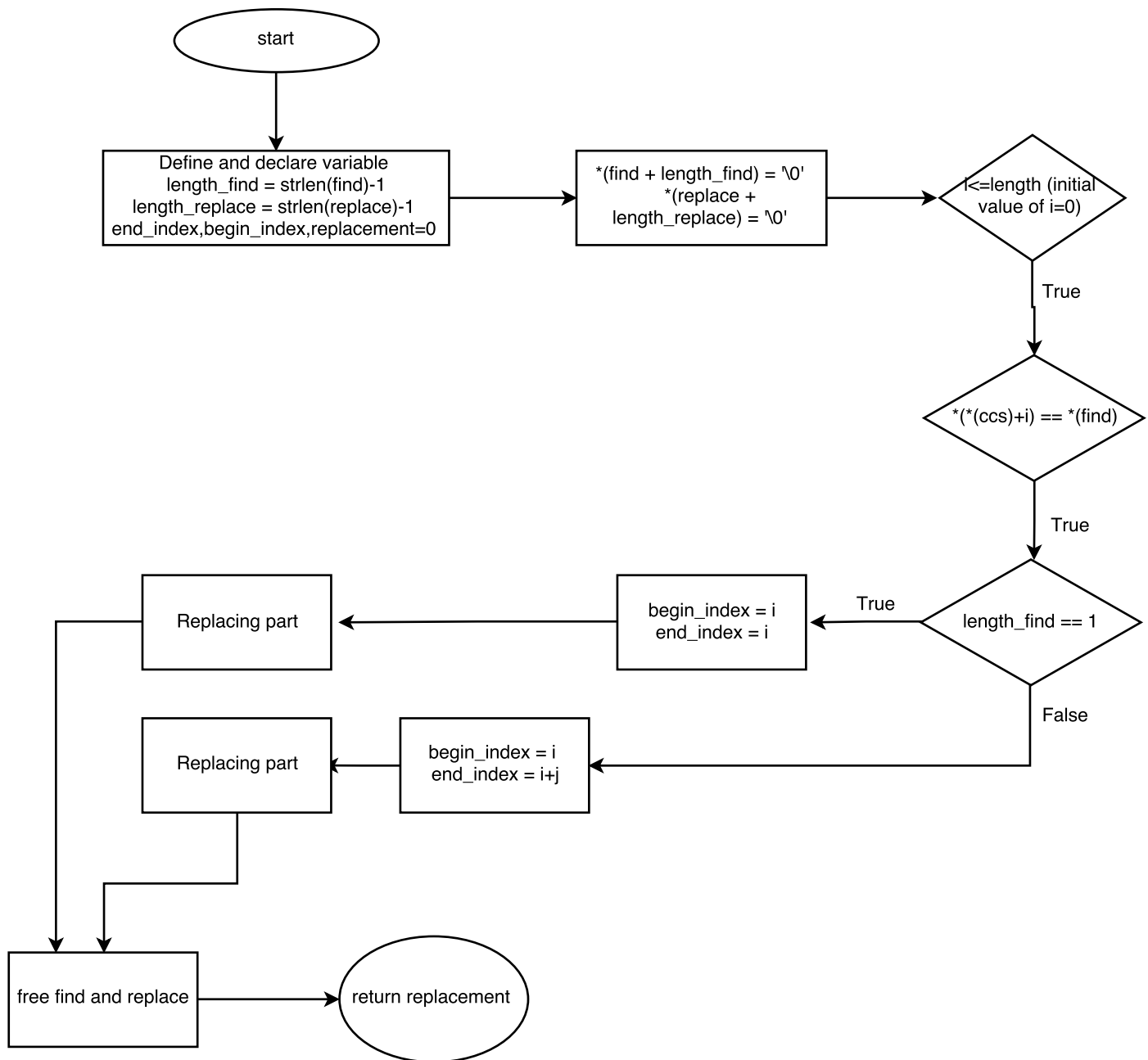
Flowchart: remove_string(char **ccs, int begin_index, int end_index)



Flowchart: insert_string(char **ccs, char *insert, int begin_index)



Flowchart: replace_string(char **ccs, char *find, char *replace)



Flowchart: main

