

Programming in C

Duration time: 90 minutes

Introduction

Requirements

- Arrays and strings.

Exercise 1

Functions

Write the following functions. Each of these functions should have a single parameter -- accepting a c-style string as an argument. The function should **only** do what is specified (note that none of these functions do any output to the screen). Your functions should use `const` in the prototype wherever it is appropriate:

1. Write a function that counts and returns the number of vowels in the string. (For the purposes of this exercise, we are talking about the standard 5 vowels -- A, E, I, O, U).
2. Write a function that counts and returns the number of consonants in the string.
3. Write a function that converts the string to all lowercase.
4. Write a function that converts the string to all uppercase.

Menu program

Write a main program that performs the following steps:

1. Prompt the user to enter a string, and let them type it in. This could be an entire sentence, with the newline indicating the end of the string. You may assume the string will be no more than 100 characters, so declare your array accordingly.
2. Display the following menu:

```
A) Count the number of vowels in the string
B) Count the number of consonants in the string
C) Convert the string to uppercase
D) Convert the string to lowercase
E) Display the current string
F) Enter another string

M) Display this menu
X) Exit the program
```
3. Enter a loop, allowing the user to type in a menu choice each time. Loop should continue until the user enters the command to exit. Upper and lowercase letters should be allowed for the menu choices.
 - When the A or B commands are entered (counting vowels or consonants), call the corresponding function, then print the result
 - When the C or D commands are chosen, just call the appropriate function to convert the string. Do not do any output from main on these commands.

- When E is chosen, print the contents of the stored string.
- When F is chosen, allow a new string to be typed -- this will replace the previous one.
- The menu should only be displayed once at the start, and then again whenever the M option is selected

Exercise 2

Write a C program to find length of a string using loop. How to find length of a string without using in-built library function strlen() in C programming. C program to find length of string through inbuilt strlen() string function.

Example:

Input string: I love programming. I love CodeforWin.

Output length of string: 38

Exercise 3

Write a C program to copy one string to another string using loop. C program to copy one string to another without using inbuilt library function strcpy() and count total number of characters copied. How to copy one string to another and count total characters copied with and without using inbuilt string library function in C programming.

Write a C program to copy one string to another using strcpy() library function. How to use strcpy() library function.

Example:

Input string1: Hello World!

Output string2: Hello World!

Exercise 4

Write a C program to compare two strings using loop character by character. How to compare two strings without using inbuilt library function strcmp() in C programming. Comparing two strings [lexicographically](#) without using string library functions.

Write a C program to compare two strings using strcmp() library function. How to use strcmp() string library function. Comparing two different strings using inbuilt string library function in C programming.

Example:

Input string1: CodeforWin

Input string2: CodeforWin

Output: Both strings are equal

Exercise 5

Write a C program to count total number of alphabets, digits or special characters in a string using loop. How to find total number of alphabets, digits and special characters in a string in C programming.

Example:

Input string: I love programming.

Output: Alphabets = 16

Digits = 0

Special character = 3

Total length = 19

Exercise 6

Write a C program to input any string from user and find the first occurrence of a given character in the string. How to find the first occurrence of a given character in a string in C programming.

Example:

Input string: I love programming.

Input character: o

Output: 3

Exercise 7

Write a C program to count all occurrences of a character in a string using loop. How to find total occurrences of a given character in a string using for loop in C programming. Program to calculate total occurrences of a character in a given string.

Example:

Input string: I love programming. I love CodeforWin.

Input character to search: o

Output total occurrences of 'o': 5