
COLLEGE OF INFORMATION TECHNOLOGY**CSEB134 Principles of C Programming****More Exercises on Functions****EXERCISE 1**

Write a complete C program consisting of two user-defined functions (i.e. product and sum). The first function is to calculate the product of the two integers and the second function is to calculate the sum. The main() function should request for two integers from the user and call the two functions respectively.

EXERCISE 2

The following program accepts a character from the user and then determines whether it is a digit, vowel, consonant or; neither a letter or a digit. Rewrite the following program by introducing 4 separate functions called DIGIT, VOWEL, CONSONANT and NEITHER. Use the main function to accept the character from the user, and call all four functions to determine the type of character entered.

```
#include<stdio.h>

void main()
{
    char input;

    printf("Enter a character: ");
    input = getchar();

    if(input >= '0' && input <= '9')

    printf("You have entered a DIGIT!\n");

    if(input >= 'a' && input <= 'z' || input >= 'A' && input <= 'Z')
    {
        if(input == 'a' || input == 'e' || input == 'i' || input == 'o' || input == 'u')

        printf("You have entered a VOWEL!\n");
    }

    if(input >= 'a' && input <= 'z' || input >= 'A' && input <= 'Z')
    {
        if(!(input == 'a' || input == 'e' || input == 'i' || input == 'o' || input == 'u'))

        printf("You have entered a CONSONANT!\n");
    }

    if(!(input >= 'a' && input <= 'z' || input >= 'A' && input <= 'Z' || input >= '0' && input <= '9'))
    {
        printf("You have entered neither a digit nor a letter!\n");
    }
}
```

EXERCISE 3

Write a complete C program consisting of a user-defined function called maximum. The main() function should request three integers from the user and then passes them to maximum() to determine the largest number among all three. Then the maximum() function return the largest number to main() to print.

EXERCISE 4

Write four functions to compute the following properties of a sphere, given a diameter, a, which is greater than or equal to 0.0.

- a) Radius $r = d/2$
- b) Surface area $= 4 \times \pi \times r^2$
- c) Circumference $= \pi d$
- d) Volume $= \frac{4}{3} \times \pi \times r^3$

Write a main program that will input the diameter of sphere, call all four functions and print out the four results. Do not accept inputs less than 0.0.

EXERCISE5

Write a complete C program containing functions that can be used to perform the following operations on any two numbers.

- a) Addition
- b) Multiplication
- c) Subtraction
- d) Division

You are required to make use of a menu to present the list of options. The main section of the program is to print the results of the chosen computation.

EXERCISE 6

Write a complete C program that reads total hours worked in a day of 5 employees and plot the histogram that shows how many hours each employee has worked. Introduce two functions named *get_hours* and *plot_hours* that will be called by the main function.

Use *get_hours* function to obtain the total number of hours worked from each employee. This function should accept an integer array that is going to be filled by the user. Assume that each employee can only worked up to 12 hours in a day. Therefore, this function also must ensure that the hours entered in only between 0 and 12 inclusive.

The *plot_hours* function is used to plot the histogram of total hours worked for each employee.

Your main function should look like this:

```
int hours[10];

get_hours(hours);
plot_hours(hours);
```

Your output should look like this:

```
Enter total hours worked for employee 1: 8
Enter total hours worked for employee 2: 6
Enter total hours worked for employee 3: 10
Enter total hours worked for employee 4: 12
Enter total hours worked for employee 5: 8
```

The plot is:

```
Employee      Total Hours Worked
 1             *****
 2             *****
 3             *****
 4             *****
 5             *****
```

[10 Marks]