Department of ICT
Faculty of Technology
University of Ruhuna

Programming Practicum – ICT1142 **Level 1- Semester 1**

Lab Sheet 08 **| 2022**

Objective:

To familiarize with the user-define functions in C programming language.

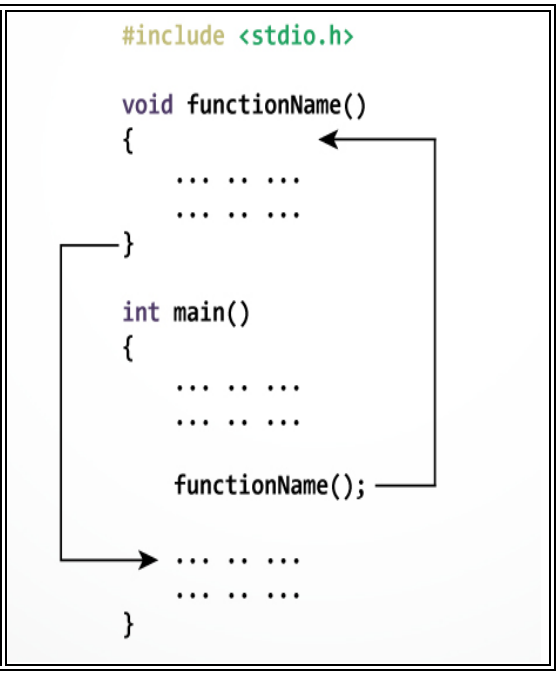
User-defined function

```
#include <stdio.h>

void functionName(); //Prototype of the function

int main(){
   ... .. ...
   ... .. ...
   functionName();   //Function Invocation
   ... .. ...
   ... .. ...
}

void functionName()   //Function Definition
{
   ... .. ...
   ... .. ...
}
```



Exercise 01

Write a C program to input three numbers from the user and find the maximum among them using a function.

```
int max();                  // Function prototype

int main(){                 // main Function
   int maximum;
   maximum = max();  //Calls the maximum function
   printf("\nMaximum = %d\n", maximum);

   return 0; }

//Define the function
```

Exercise 02

Write a C program to input radius of circle from user and find diameter, circumference and area of the given circle using function.

Function declarations/Prototypes
double diameter(double radius);
double circumference(double radius);
double area(double radius);

Diameter = 2*radius
Circumference = 2*π*radius
Area = π*radius^2

Exercise 03

Write a C program to calculate the amount spent on buying a particular product from the market. You should define a function called "**calcCost**" which should take two arguments stated bellow,

1. The name of a product (A/B/C or D)
2. Number of units bought from that product

Cost per unit for each products are as follows,

- Product A → Rs. 50.00
- Product B → Rs. 100.00
- Product C → Rs. 70.00
- Product D → Rs. 180.00

Function should print the total cost for buying the product after doing necessary calculations.
Note: Use a **switch case** as the control structure.

Exercise 04

Write a function "**findRank"** that input student's **average** and return,

- A, if a student's average is 90-100
- B, if the average is 70-89
- C, if the average is 50-69
- D, if the average is 30-49 and
- F, if the average is 0-29.

Get the average mark of student as a user input.

Exercise 05

a. Define a function "factLoop(int n)" to **find and print** the factorial of a user entered number **using loops**. This number should be the argument to the function.

   Hint: factorial of n (n!) = n*(n-1)*(n-2)*…*2*1
   1! or 0! = 1

b. Define a new function "factRecursion(int n)" to **find and return** the factorial using function recursion (without loops).

Exercise 06

Write three functions,

- "my_add" to add its two parameters together and return the sum,
- "my_multi" to multiply its two parameters, and return,
- "my_square" to find and return the square of its single parameter.

Call your functions in main program to calculate the result of this mathematical expression. **Note:** you will need to have four function calls.

$$\mathbf{(3*4+5*7)^2}$$

Exercise 07

Write a recursive function in C programming to find sum of all natural numbers between 1 to n. take 'n' as a user input.

Exercise 08

Implement a small scientific calculator using C functions. First a menu of operations should be displayed to the user as bellow.

```
---------------------------------
Scientific Calculator
-----------------------------
1. Power
2. Square Root
3. Exponential
4. Log
5. Round
Enter the operation number:
---------------------------------
```

Define separate functions for each operation and invoke them according to the user option. Take necessary inputs to the scientific operation and output the answer. Use math.h library functions as needed.

Finally display a message “Do you want to continue? Y/N“ to the user. Repeat the menu until user enters “N” as the answer.