

**Department of ICT
Faculty of Technology
University of Ruhuna**

Programming Practicum – ICT1142

Level 1- Semester 1

Lab Sheet 07

| 2022

Objective:

To familiarize with repetition/iteration control structures in C programming language.

<u>while loop</u> Repeats a statement or group of statements while a given condition is true. It tests the condition before executing the loop body.	<pre>while(condition) { statement(s); }</pre>
<u>for loop</u> Executes a sequence of statements multiple times and abbreviates the code that manages the loop variable.	<pre>for (init; condition; increment) { statement(s); }</pre>
<u>do-while loop</u> It is more like a while statement, except that it tests the condition at the end of the loop body.	<pre>do { statement(s); } while(condition);</pre>
<u>nested loops</u> You can use one or more loops inside any other while, for, or do-while loop.	<pre>for (init; condition; increment){ for (init; condition; increment){ statement(s); } statement(s); }</pre>

Exercise 01

- a) Write a C program to print all odd numbers from 1 to 100 using for loop.
- b) Modify above program using while loop and do while loop also.

Exercise 02

- a) Write a C program to find the sum of all natural numbers between 1 to n using **for loop**. “n” should be taken by the user. Hint: $1 + 2 + 3 + \dots + n$

Example:

Enter n: 5

Sum of natural numbers between 1-5: 15

- b) Modify the program to take both number limits (m and n) from user and find the sum of all natural numbers between the limit. Hint: $m + (m+1) + (m+2) + \dots + n$

Exercise 03

Write a C program to read marks for **four subjects** using a **while loop**. Calculate the average and output the results (pass/fail) according to the average.

```
average >=45
    pass
average <45
    fail
```

Exercise 04

Write a C program to enter a number from user and print multiplication table of the given number using **for loop**.

```
Output
Enter number to print the table of: 5
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

Exercise 05

a) Write C programs to print following square star (*) patterns (**Nested loop**).

***** ***** ***** *****	* ** *** **** ***** *****	***** **** *** ** *	* ** *** **** *****	***** **** *** ** *	* *** ***** ***** *****
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b) Write programs in C to display the patterns below.

1	1
12	22
123	333
1234	4444

Exercise 06

Develop a program to display a menu with simple operations of a calculator as bellow. Corresponding operation should be performed and display the result according to the selected menu option number. First the option number should be taken by the user and then two values for the calculation. Menu should be displayed continuously until user select exit option. Give a suitable error message for incorrect option inputs. (Use **do-while** and **switch**)

```

My Calculator
-----
1. Addidtion
2. Substraction
3. Multiplication
4. Division
5. Exit
Enter your option: 3
Enter numbers: 10 5

The result is: 50
-----

```

Exercise 06

Find the number of digits in an user entered integer using a while loop.

Ex: if the number is 57123, number of digits are 5.

Exercise 07

- a) Write a C program to find the maximum from a list of 10 user given numbers using for loop.
- b) Modify the above program using while and do while loop.
- c) Write a C program to find the maximum from a list of any user given numbers using appropriate loop. (Hint: use sentinel control value)

Exercise 08

Write a C program to calculate the factorial of a given number using appropriate loop structure.

Example:

Input the number: 5

The Factorial of 5 is: 120

Exercise 09

Write a C program to find sum of all odd numbers from 1 to n using for loop. n should be taken from the user.

Exercise 10

Write a program in C to display the number in reverse order.

Example:

Input the number: 45

Reverse order of 45: 54