Higher Diploma in Information Technology

Introduction to Programming (C++)

Year 1 Semester 1 – 2022

Worksheet 05

Intended Learning Outcomes:

At the end of the class the students should be able to:

- Use while-loop in a C++ program
- Use do-while loop in a C++ Program
- Use for-loop in a C++ program
- Use nested loops in C++ programs
- Use break and continue statement in C++ program

Exercise 01: Create a simple C++ program as **Ex01.cpp** to print numbers from 10 to 1 and observe the usage of while-loop structure.

```
#include <iostream>
using namespace std;
int main()
{
      int no = 10;
      while (no > 0)
      {
            cout << no << endl;
            no = no - 1;

      } /* end of while loop */

      return 0;
} /* main */
```

Exercise 02: Save a copy of the above program as **Ex02.cpp** and modify a program to print "Welcome to SLIIT" ten times using while-loop structure.

Exercise 03: Create a program called **Ex03.cpp** to input 5 numbers from the keyboard and print the sum and the average to the screen using while-loop structure.

Exercise 04: Create a C++ program called **Ex04.cpp** to input a list of positive numbers from the keyboard and find the average. The list is terminated with the value -99 (Sentinel input value).

Exercise 05: Create a program called **Ex05.cpp** using the do-while structure to read the name of an employee (terminal input). If the name is not equal to 'END' then it read the number of hours worked and the rate per hour. Then program calculate the total pay and print the total pay. This process is repeated until the name read is equal to "END".

Exercise 06: Create a simple C++ program as **Ex06.cpp** and observe the usage of for-loop structure.

```
//This program prints numbers from 10 to 1
#include <iostream>
using namespace std;
int main()
{
      for (int no = 10; no > 0; no--)
      {
            cout << no << endl;
      } /* end of for */

      return 0;
} /* main */
```

Exercise 07: Write a C++ program as **Ex07.cpp** to print numbers from 1 to 10, using for-loop structure.

Exercise 08: Save a copy of the above program as **Ex08.cpp** and modify your program to print even numbers from 1 to 10.

Exercise 09: Save a copy of the above program as **Ex09.cpp** and modify your program to print the sum of 1 to 10 using for-loop structure.

Exercise 10: Print the following patterns using nested loop statements. Save the programs with the names of **Ex10-A.cpp and Ex10-B.cpp.**

```
Sample Output:
Enter number: 3
1
2 2
3 3 3
```

```
Sample Output:
Enter number: 3
*
* *
* * *
```

Exercise 11: Write a program called **Ex11.cpp** to print numbers from 1 to 10 and break the program at line number 5. Use break statement.

Exercise 12: Write a program **Ex12.cpp** to print the following number pattern using continue statement.

```
Sample Output:
Enter number: 6
1 2 4 5 6
```

Exercise 13:

A program is needed for Black Cabs Transport Company, to calculate the total amount a particular customer should pay for a given trip. The services provided by the cab service company are listed below.

Package No	Package Name
1	Comfort Journey
2	Budget cab Journey
3	Crowded Journey – Dual A/C
4	Crowded Journey – Single A/C

For ***comfort Journey package***, Rs.150.00 is charged for the first kilometer and for each additional kilometer, Rs.175.00 will be charged. For a ***Budget cab Journey package*** each kilometer is charged at Rs. 100.00. For a ***Crowded Journey – Dual A/C package*** the first kilometer is charged at Rs. 130.00 and each remaining kilometer is charged at Rs.150.00. If the customer selected ***Crowded Journey – Single A/C package***, the first kilometer is charged at Rs120.00 and for each remaining kilometer is charged at Rs. 130.00.

a) Write a C++ program to input the **package no** and **total distance of the tour in Kilometers** through the keyboard. The program should display corresponding total amount that the customer has to pay. (***Hint: use nested selection statements.)***

```
Ex: Package No: 2
Total Distance: 5 Km
Total Amount: Rs. 500
```

b) Modify your program to display an error message "Invalid Package Number!!!" if the user inputs a wrong package number.

c) Modify the program to handle many customers. After displaying the total amount to pay by the first customer, your program should display the prompt "**Do you have more customers?**" If the user inputs **"y"** or **"Y",** program should ask for the package no and total distance of the next customer. If the user inputs "n" or "N" program should terminate and print "".