Higher Diploma in Information Technology

Introduction to Programming (C++)

Year 1 Semester 1 – 2023

Worksheet 04

Intended Learning Outcomes:

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

- Use if-else structure in a C++ program
- Use switch-case structure in a C++ program
- Use conditional statement in a C++ Program

Exercise 01:

Writing a simple C++ program to observe the structure of a simple if-else statement. Save the program with the name of **Ex01.cpp.**

```
//This program is to observe the usage of if-else statement

#include <iostream>
using namespace std;
int main () {

   int a = 100;

   if( a < 20 ) {
      cout << "a is less than 20;" << endl;
   }
   else {
      cout << "a is not less than 20;" << endl;
   }
   cout << "Value of a is : " << a << endl;

   return 0;
}
```

Exercise 02:

Write a C ++ program that takes a number from the user and checks whether that number is either positive or negative. Save the program with the name of **Ex02.cpp.**

```
Sample Output:
Enter an integer: -7
Number is Negative.
```

Exercise 03:

Write a C++ program to check whether a triangle can be formed by the given value for the angles. Save the program with the name of **Ex03.cpp.**

Hint: To form a triangle sum of angles should be 180.

```
Sample Output:
Input three angles of triangle: 40 55 65
The triangle is not valid.
```

Exercise 04:

Writing a simple C++ program to observe the structure of a nested if-else statement.

Observe the output of the following code structure. Save the program with the name of **Ex04.cpp.**

```
//This program represents the usage of a nested if-else statement
#include <iostream>
using namespace std;

int main () {
      int i;
      i = 3;
      if (i > 2)
      {
            if (i < 4)
            {
                  cout << "i is three";
            }
      }
      return 0;
}
```

Exercise 05:

Write a C++ program to calculate and print the BMI (Body Mass Index) value of the person depending on the height and the weight of the person. The user enters the height and the weight of the person to the program as user input.

The BMI of the person is calculated as follows:

$f = \frac{w}{h^2}$ w = weight
h = height

And, the program is required to find the category of a person based on the BMI value. The categories are given below.

BMI value	Category
0-18.5	Under Weight
18.6 - 25	Healthy Weight
26-30	Over Weight
Over 30	Obese

```
Sample Output:
Enter weight: 65.0
Enter Height: 1.76
The BMI value of person is: 20.983
The Category is Healthy Weight
```

Save the program with the name of **Ex05.cpp.**

Writing a simple C++ program to observe the structure of a conditional (ternary operator)

Exercise 06:

Observe the output of the following code structure. Save the program with the name of **Ex06.cpp.**

```
//This program represents the usage of conditional (ternary //operator)
#include <iostream>
using namespace std;

int main () {
   // Local variable declaration
   int x, y = 10;

   x = (y < 10) ? 30 : 40;
   cout << "Value of x: " << x << endl;

   return 0;
}
```

Exercise 07:

Write a C++ program which takes the age of a person as an integer value, from the user input. The program should print whether the person is an adult if the age is greater than 18 else your program should print that the person is a child. Use only the conditional ternary operator.

Save the program with the name of **Ex07.cpp.**

Writing a simple C++ program to observe the structure of switch-case statement.

Exercise 08: Observe the output of the following code structure. Save the program with the name of **Ex08.cpp.**

```
#include <iostream>
using namespace std;

int main () {
   // local variable declaration
   char grade = 'D';

   switch(grade) {
      case 'A' :
         cout << "Excellent!" << endl;
         break;
      case 'B' :
      case 'C' :
         cout << "Well done" << endl;
         break;
      case 'D' :
         cout << "You passed" << endl;
         break;
      case 'F' :
         cout << "Better try again" << endl;
         break;
      default :
         cout << "Invalid grade" << endl;
   }
   cout << "Your grade is " << grade << endl;

   return 0;
}
```

Exercise 09:

Write a C++ program to read the day of the week from the user input as an integer value. Use only the switch-case statements to decide the day based on the user input. Save the program with the name of **Ex09.cpp.**

Day of the Week	Day
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday
7	Sunday
7>	Invalid Date