

## CL-217

### Programming

### Fundamentals Lab # 8

#### Objectives:

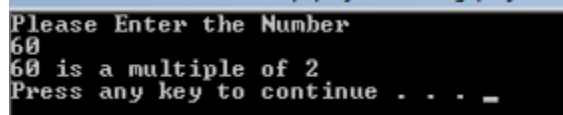
- Practice and understanding on basic c++ programs
- Control Structure
- If statement
- If else statement
- If else-if else statement
- Switch statement
- Ternary operator
- Nested if

**Note:** Carefully read the following instructions (*Each instruction contains a weightage*)

1. Use proper font family (Calibri or Times New Roman) and font size of title (16 points), heading (14 points), sub heading (12 points) and normal text (10 points).
2. First think about problem statement and then write/draw your logic on paper.
3. **Microsoft Visual Studio** should be used to make c++ programs. Programs made with any other software would not be accepted.
4. For each task in the manual create a new C++ program with the naming convention as follows:  
**TASK-NO**
5. **Mention what is happening in each line of code using comments.**
6. Write all codes one by one with proper numbering and also paste screen shot of each problem using **snipping tool**(default screen capture software in windows) on **Microsoft word file**.
7. Please submit your file with this naming convention **ROLLNO\_SECTION\_GROUPNO\_LABNO**.
8. **Do not copy from any source otherwise you will be penalized with negative marks.**
9. Submit your lab on **Google Classroom**.

#### Problem: 1 (Ternary Operator)

Input an integer variable from user.  
Tell whether it is a multiple of 2 or not.  
Sample output:



```
Please Enter the Number
60
60 is a multiple of 2
Press any key to continue . . . _
```

## Problem: 2 (If- else if- else)

Suppose that x, y, and z are int variables, and x = 10, y = 15, and z = 20. Write a single C++ code to determine whether the following expressions evaluate to true or false.

- a)  $!(x > 10)$
- b)  $x \leq 5 \mid \mid y < 15$
- c)  $(x \neq 5) \&\& (y \neq z)$
- d)  $x \geq z \mid \mid (x + y \geq z)$
- e)  $(x \leq y - 2) \&\& (y \geq z) \mid \mid (z - 2 \neq 20)$

## Problem: 3 (if else)

Understand the following C++ program and what will be the output(s)?

```
#include <iostream>

using namespace std;

int main()
{
    int myNum = 10;
    int yourNum = 30;
    if (yourNum % myNum == 3)
    {
        yourNum = 3;
        myNum = 1;
    }
    else if (yourNum % myNum == 2)
    {
```



```
yourNum = 2;  
myNum = 2;  
}  
else  
{  
yourNum = 1;  
myNum = 3;  
}  
cout << myNum << " " << yourNum << endl; return 0;  
}
```

## Problem: 4 (nested if-else)

Write a program to input three integer values. Compare the three values to find out if they are equal.

- I. Use nested if-else and print the message "All values are equal" if they are equal. Otherwise print the message "These values are different".
- II. Also find the greatest value among three values.

## Problem: 5 (switch)

Write a program to perform the basic calculator operations using switch statement

Demo of your program should just like that:

First user will enter two variables and then program ask for the operation to be performed to those two variables.

```
enter 1st Number
10
enter 2st Number
5
Enter operator i.e. +,-,*,/
+
Sum of 1st and 2nd number is :15
Press any key to continue . . .
```

## Problem: 6 (if with logical operators)

Write a program that prompts the user to input three numbers. The program should then output the numbers in descending order.

## Problem: 6 (if with logical operators)

A program uses a char variable named membership and an int variable named age. The membership variable contains one of the following letters (entered in either uppercase or lowercase): M or N. The letter M stands for *member*, and the letter N stands for *non-member*. The program should display the appropriate seminar fee, which is based on a person's membership status and age. The fee schedule is shown in Figure. Write the C++ code to display the fee. (Use if-else and nested if-else to solve the problem)

|      |                                    |
|------|------------------------------------|
| \$10 | Club member less than 65 years old |
| \$5  | Club member at least 65 years old  |
| \$20 | Non-member                         |

## Problem: 7 (if else-if else)

Write a program to calculate the electricity bill of FAST-NU Faisalabad. The rates of electricity per unit are as follow:

- If the units consumed are equal or less than 100, then the cost is Rs. 6/- Per unit and no surcharge of bills is added.
- If units consumed are within 101-300, then the cost is Rs. 7.5/- per unit and a

- c) If units consumed more than 300, then the cost is Rs. 9/- per unit and a surcharge of 20 % is added.

Keep in mind that you should take values form user in the current and previous reading forms.

For example I have reading of month January 3466 units and counting for February. I will enter previous reading 3466 and current reading will be 3600 for February. So I get (3600-3466= 144units).

**Note:**

- a) The answer should be as precise as you can.
- b) Mean that use int where int use and use float/double where use.

**Problem: 8(using nested If-else statement)**

Write a program to find out the roots of quadratic equation ( $ax^2 + bx + c=0$ ).

The user enter values of a, b and c only. The values entered must be greater than 0, if any of the value is 0 then print "The value can't be zero". If any value entered is less than zero then print "Values must be greater than Zero".

The roots are calculated as:

- i) If disc. is greater than zero then roots are real and unequal.

$$\text{root1}=(-b+(\text{dics})^{1/2}/2*a).$$

$$\text{root2}=(-b-(\text{dics})^{1/2}/2*a).$$

- ii) If disc. is less than zero then roots are imaginary .

$$\text{root1}=(-b+i(\text{dics})^{1/2}/2*a).$$

$$\text{root2}=(-b-i(\text{dics})^{1/2}/2*a).$$

- iii) If dics. is equal to zero then roots are real.

$$\text{root1}=\text{root2}= -b/(2*a).$$

**Note:**

- "disc" mean Discriminator having value  $\text{dics}= b^2 -4*a*c$ .
- Use <math.h> library in your code and use 'sqrtf' for square root.
- The value of iota is constant i.e.  $i=-1$ .