CL-1002
Programming Fundamentals
Lab # 8

Objectives:

- Practice and understanding on basic c++ programs

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

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function about its functionality.
3. Use understandable name of variables.
4. Proper indentation of code is essential.
5. Write a C++ statement(s) for each of the following task one after the other, in the same order.
6. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of **every task output in MS word and submit .cpp file with word file**.
7. Make separate .cpp files for all tasks and use this format **23F-1234_Task1.cpp.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google classroom. (Make sure your submission is completed).
11. Please submit your word file in this format **23F-1234_L1.docx**
12. Do not submit your assignment **after the deadline**.
13. **Do not copy code from any source otherwise you will be penalized with negative marks.**

Problem No 1| If else-if else

Write a program that input a marks out of 100 from the user and displays his/her grades.
1. If marks are greater than 80 display “You got A grade”
2. If marks are greater than 50 display “You got B grade”
3. If marks are greater than 40 display “You got C grade”
4. If marks are below than 40 display “You got F grade”

Note: Number must be 1 to 100 otherwise display invalid number.

Problem No 2| If else-if else

The following program contains errors. Correct them so that the program will run and also mention reason of error if any

```
#include <iostream>

using namespace std;

const int SECRET = 5

main ()
{
    int x, y, w, z;
    z = 9;

    if z > 10
        x = 12; y = 5, w = x + y + SECRET;
    else
        x = 12; y = 4, w = x + y + SECRET;

    cout << "w = " << w << endl;
}
```

Problem No 3| If else-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 No 4| If else-if else

Suppose that x, y, and z are int variables, and x = 6, y = 25, and z = 100. Write a single C++ code to determine whether the following expressions evaluate to true or false.

a) !(x > 10)
b) x <= 5 || y < 15
c) (x != 5) && (y != z)
d) x >= z || (x + y >= z)
e) (x <= y - 2) && (y >= z) || (z - 2 != 20)

Problem No 5| If else-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 No 6| If else-if else

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)

Rs. 10000	Club member less than 65 years old

Rs. 5000	Club member at least 65 years old
Rs. 15000	Non-members

Problem No 7| If else-if else

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. root1=(-
b+(dics) 1/2 /2*a).
root2=(-b-(dics) 1/2 /2*a)

ii) If disc. is less than zero then roots are imaginary . root1=(-
b+i(dics) 1/2 /2*a).
root2=(-b-i(dics) 1/2 /2*a)

iii) If dics. is equal to zero then roots are real.
root1=root2= -b/(2*a).
Note:

- "disc" mean Discriminator having value dics= b2 -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.

Problem No 8| If else-if else

Write a program that generates a random number between 1 and 100. If number is less than 50 then it display "Input number is small" and if number is greater than 50 it display "Input number is large" and if number is 50 then "Input number is average". Remember your input number is not less than 1 and not greater than 100.

Problem No 9| 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:

a) If the units consumed are equal or less than 100, then the cost is Rs. 10/- Per unit and no surcharge of bills is added.

b) If units consumed are within 101-300, then the cost is Rs. 12.5/- per unit and a surcharge of 10% of bill is added.

c) If units consumed more than 300, then the cost is Rs. 15/- 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:

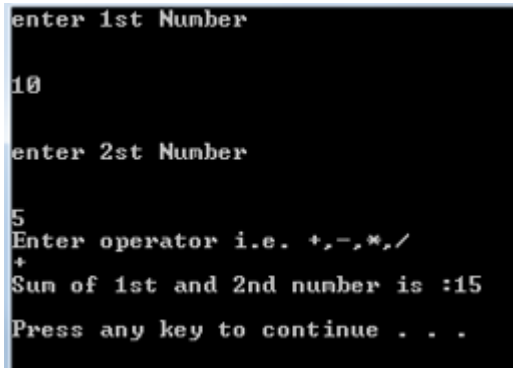
a) The answer should be as precise as you can.
b) Mean that use int where int use and use float/double where use.

Problem No 10| If else-if else

Write a program to perform the basic calculator operations using nested if-else

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.



Proper text alignment and screenshots will hold extra marks!

Best of luck ☺

You are done with your exercise, submit to the classroom at given time.