CL-1002
Programming Fundamentals
Lab # 6

Objectives:

1. Practice and understanding on basic C++ programs
2. Control Structure
3. If statement
4. If else statement
5. If else-if else statement
6. Switch statement
7. Ternary operator
8. Nested if

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

1. First think about statement problems and then write your program.
2. Write Program in C compiler/IDE and save source file **for each program.**
3. Do not copy from any source otherwise you will be penalized with negative marks.
4. Complete your lab **within given Time Slot**.
5. Add your source code in this word document + Make one ZIP file of your all source codes.
6. Please submit your **Both files** with this naming convention ROLLNO_SECTION_LABNO.
7. Submit your lab on Google Classroom.

Predict the Output of the following code snippet:

Program 1:
```
int main() {
  int a = 9;
  if(a>10)
      cout<<" Number is greater";
      cout<<" Program End";
  return 0;
}
```

Program 2:
```
int main() {
  int a =3;
  float b = 3.0;
      if(a==b)
      cout << "Both are equal";
return 0;
}
```

Program 3:
```
int main() {
  char ch = 'A';
  int a = 65;
  if(ch==a)
        cout << "Both are equal";
  return 0;
}
```

Program 4:
```
int main() {
  int a =3;
  float b = 4.0;
      if(a==b);
      cout << "Both are equal";
  return 0;
}
```

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   (Ternary Operator)

You only allowed to use ternary operator for decision.
Write a computer program that take three numbers from user and check whether these are equal OR not. In case of equal print message "Numbers are equal" and in case of not equal print message should be "Numbers are not equal."

Hint: You can use multiple Ternary Operator

Problem: 3 (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 <= 5 || y < 15

c)   (x != 5) && (y != z)

d)   x >= z || (x + y >= z)

e)   (x <= y - 2) && (y >= z) || (z - 2 != 20)

Problem: 4 (If- else if- else)   (Marks = 1)

Write a program that asks user to enter number of sides of the shape then asks to enter the lengths. It is restricted to three major shapes. If user enters '0' as number of sides then ask to enter 'radius' length and program print area of the circle. If user enters '3' then program prints the area of the triangle. If user enters '4' then program prints the area of the rectangle.

Area of Circle: πr^2 *Area of Triangle: ½(l×w)*

Area of rectangle: l×w

Problem: 5 (If- else if -else)   (Marks = 1)

Write a computer program that takes **(Matric Marks, Intermediate Marks, and Entry Test Marks)** from student and suggests degree programs of a BS degree applicants.

If student's **Entry Test** marks are less than 50%, OR **Matric and Intermediate marks** are less than 40%. In any of this case he/she is straight away rejected with message saying "not qualified".

Otherwise, if student's aggregate is above 60% he/she is admitted to BSCS program.
Otherwise, if student's aggregate is above 55% he/she is admitted to BSSE program.
Otherwise, if student's aggregate is above 50% he/she is admitted to BSAI program.
Otherwise, if student's aggregate is above 45% he/she is admitted to BSBA program.
Otherwise, student is shown message as "not qualified".

Note: Aggregate Formula = Matric (20 %) + Intermediate (20 %) + Entry Test (60 %)

Problem: 6 (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: 7 (switch)

You need to create a classifier using the if else and switch statement. Let say the name of your classifier program is "**Alpha Dict**". The user of the Alpha Dict will always enter a character between the range of 'A' to 'Z' (Only Capitals), and then get result either it is "Vowel" OR "Consonant".

You are only allowed to use **Switch statement** to build logic for Vowel and Consonant, but you can use if-else to check whether the character is in the range of (A-Z).

Problem: 8

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: 9 (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.

    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= 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.