National University of Computer and Emerging Sciences, Lahore Campus

Programming Fundamentals

Total Marks: 40

Section: BSE-1A, BSE-1B   **Due Date:** 8th September 2022

Instructions:

Please read the following instructions carefully before submitting the assignment.
1. Save your file with your Roll Number and Name
2. Submit your assignment in Google Classroom
3. It should be clear that your assignment will not get any credit if:
   - The assignment is submitted after due date.
   - Assignment is copied(partial or full) from any source (websites, forums, students, etc)

Objective:

The objective of this assignment is to provide an on hand experience of:
1. Learn to code, edit, compile and execute C++ program.
2. Learn to use arithmetic operators in C++ program.

Guidelines:
1. Code should properly be indented and well commented.
2. Follow C/C++ naming conventions while using variables etc.

Assignment Description:

TASK 1:

Write a program to display the following output using a single cout statement.

```
Subject        Marks
Mathematics    90
Computer       77
Chemistry      69
```

TASK 2

Write a program which accept principle, rate and time from user and print the simple interest.

Formula: Interest=(principle * rate * time) /100

TASK 3:

Write a program that takes two integers from the user through keyboard. The read values are stored in the integer variables value1 and value2.After reading the values through the keyboard; perform the following basic operations on the operands:

- Addition of value1 and value2
- Subtraction of value1 and value2

- Multiplication of value1 and value2

- Division of value1 and value2

- Modulus of value1 and value2.

- Average of value1 and value2.

- Square of value1.

Declare five more variables in your program by variable names sum, subtraction, multiplication, division, modulus, average and square .Store the results of the relevant operations in these variables and use these variables to display the output.

Sample Output

Enter two integer values.

Enter value1

7

Enter value2

6

Addition of 7 and 6 is 13

Subtraction of 7 and 6 is 1

Multiplication of 7 and 6 is 42

Division of 7 and 6 is 1

Modulus of 7 and 6 is 1

Square of 7 is 49

Hints

There are two integer variables value1 and value2.

The formula for calculating square is (value1*value1).

The formula for calculating average is (value1+value2)/2.

Declare a separate variable for each operation: For example you may take sum as :

integer sum;

        sum=value1+value2;

TASK 4

Write a program to calculate the area of circle (area = πr^2)

Hint: take π = 3.14 as constant

TASK 5

Write a small C program to calculate and display the **area of a rectangle** using the **formula:**

areaOfRectangle = lengthOfRectangle * widthOfRectangle ;

Your program should:

- Have two variables to hold the values of length and width respectively.

- A variable to hold the area calculated for the rectangle.

- Should input the value of height and width from the user

- Print the length and width on a single line separated by tabs.

- Print the area calculated on the next line having a tab after the statement.

Sample Output

Please enter the length of the rectangle: 12

Please enter the width of the rectangle: 18

Length of the rectangle: 12   Width of the rectangle: 18

The area of the rectangle is: 216

TASK 6

Write a program that has three decimal numbers. Calculate the Average value of these numbers.

TASK 7

Write a program that has three strings your name, age and address. Display these values on screen

TASK 8

Write a program that initializes a value to a variable. Calculate the cube of the given value. Also use comments in the program

TASK 9

Write a complete C++ program that declares two integer variables named gallons and liters, and give no. of gallons any user defined value and convert it into liters using the following formula:

Liters = gallons * 4

4 gallons is equal to 16 liters.

TASK 10

Write a program that converts pounds into kilograms. The program prompts the user to enter a number in pounds, converts it to kilograms and displays the result. One pound is 0.454 kilogram.

TASK 11

Write a program that reads in the radius and length of a cylinder and computes volume using the following formulas:

Area = radius * radius * pi

Volume = area * length

TASK 12

Show the output of the following program. Fix the error and then compile it :

```
#include <iostream>
using namespace std;
int main()
{
char x= 'a';
char y= 'c';
cout << ++x << endl;
cout << y++ << endl;
cout << (x-y) << endl;
return 0;
}
```

TASK 13

Write a program that receives an ASCII code (an integer between 0 and 128) and displays its character. For example if the user enters **97**. The program displays character **a**

TASK 14

Write a program that takes input of uppercase letter and displays the corresponding lowercase letter.

Task 15

Write a C++ Program to Find Size of int, float, double and char in Your System.

Task 16

Write a C++ Program that will take three integers(a,b,c) as input from the user and copy the value of a in b, b in c and c in a, and print a, b, c.

Task 17

Write a program which accepts a character and display its next character

Task 18

Write a program which accepts days as integer and display total number of years, months and days in it.

For Example:

If user input as 856 days the output should be 2 years 4 months 6 days

Task 19

Write a program that takes length as input in feet and inches. The program should then convert the lengths in centimeters and display it on screen. Assume that the given lengths in feet and inches are integers.
Based on the problem, you need to design an algorithm as follows:
1. Get the length in feet and inches.
2. Convert the length into total inches.
3. Convert total inches into centimeters.
4. Output centimeters.
To calculate the equivalent length in centimeters, you need to multiply the total inches by 2.54. Instead of using the value 2.54 directly in the program, you will declare this value as a named constant. Similarly, to find the total inches, you need to multiply the feet by 12 and add the inches. Instead of using 12 directly in the program, you will also declare this value as a named constant. Using a named constant makes it easier to modify the program later.
To write the complete length conversion program, follow these steps:
1. Begin the program with comments for documentation.
2. Include header files, if any are used in the program.
3. Declare named constants, if any.
4. Write the definition of the function main

Task 20

What is the output of following program?

```
float net = 5689.2356;
cout.precision(2);
cout.setf(ios::fixed | ios::showpoint);
cout << net << endl;
```

Good Luck ☺