CL-1004
Object Oriented Programming
Lab # 1

Objectives:

- Revision of all concepts of programming fundamentals
- Control Structures
- Repetitive Structure including nested method
- Function
- Array
- File handling

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 and about its functionality.
3. Mention comments where necessary such as comments with variables, loop, classes etc to increase code understandability.
4. Use understandable name of variables.
5. Proper indentation of code is essential.
6. Write a code in C++ language.
7. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every task **outputs in Microsoft Word and submit word file. Do not submit .cpp file.**
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 file in this format **20F1234_L1**.
12. Do not submit your assignment after deadline. Late submission is not accepted.
13. Do not copy code from any source otherwise you will be penalized with negative marks.

Problem: 1 | Control structure (If else)

Suppose that x, y, and z are int variables, and x = 10.2, y = 20.8, and z = 50.6. Write a single C++ code to determine whether the following expressions evaluate to true or false.

a) !(z > 10)

b) x <= 5 || y < 15

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

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

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

Problem: 2 | Control structure (If else)

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

1. 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.
2. If units consumed are within 101-300, then the cost is Rs. 7.5/- per unit and a surcharge of 10% of bill is added.
3. 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:

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

Problem: 3 | Control structure

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: 4 | Repetitive structure

Write a program that uses a while statement to find the smallest integer from multiple integers. First input number which define the number of integer values you want to enter (at least 10) then input all values and finally find

1. Largest integer
2. Smallest Integer
3. mid integer

Problem: 5 | Repetitive structure (Use nested loop)

Write a program that uses for statements to print the following patterns separately, one below the other. Use for loops to generate the patterns.

Problem: 6 | Repetitive structure (use loop and switch statement)

Secondhand Rose Resale Shop is having a seven-day sale during which the price of

any unsold item drops 10 percent each day. The inventory file includes an item number,

description, and original price on day one. For example, an item that costs $10.00 on the

first day costs 10 percent less, or $9.00, on the second day. On the third day, the same

item is 10 percent less than $9.00, or $8.10.

Design an application that reads inventory records of 3 items and produces a report that shows the price of every item on each day, one through seven.

Problem: 7 | Function

The Fibonacci series

0, 1, 1, 2, 3, 5, 8, 13, 21,…

.(a) Write a function fibonacci(n) that uses type int to calculate the nth Fibonacci number.

(b) Determine the largest int Fibonacci number that can be printed on your system. Modify the program of part (a)to use double instead of int to calculate and return Fibonacci numbers, and use this modified program to repeat part(b).

Problem: 8 | Function

Write a function that takes an integer value and returns the number with its digits reversed. For example, given the number1234, thefunctionshouldreturn4321

Problem: 9 | Function

Write a program that inputs 20 double-precision, floating-point numbers and passes them to a function that returns the smallest number.

Problem: 10 | Array

Write a C++ program that declares an array alpha of 50 components of type double. Initialize the array so that the first 25 components are equal to the square of the index variable, and the last 25 components are equal to three times the index variable. Output the array so that 10 elements per line are printed.

Problem: 11 | Array (with function)

Write the definition of the function printArray that prints any one-dimensional array of type int. Print 5 elements per line. You can input numbers minimum 6

Problem: 12 | Multidimensional Array

Write a C++ Program to Perform Matrix Multiplication.

1. The program takes two matrices and multiplies them
2. If number of columns of matrix A is not equal to number of rows of matrix B, then matrices cannot be added.
3. The program is exited.
4. Else they are multiplied, and the result is printed.
5. Exit.

Problem: 13 |

Write a C++ program using while loop that will print the pattern as shown below

1

2= =1

3= =2= =1

4= =3= =2= =1

5= =4= =3= =2= =1

6= =5= =4= =3= =2= =1

7= =6= =5= =4= =3= =2= =1

8= =7= =6= =5= =4= =3= =2= =1

9= =8= =7= =6= =5= =4= =3= =2= =1

Problem: 13 | File handling

Write a c++ program that creates a text file named *firstfile.txt.* now open this file and write following sentences in the file

1. My name is……. I am student of bscs 3rd semester. My roll number is …….. I am taking course of OOP. My CGPA is……
2. Now close the file.

Problem: 14 | File handling

Write a c++ program that opens a already created file firstfile.txt (that you have created in problem 13).

1. Now read the data of file and display it. (Read the data until you reach end of file).
2. Now remove all the text from file.

Problem: 15 | File handling

Write a c++ program that creates a file and store following operation in file

1. Add
2. Subtract
3. Multiply
4. Divide
5. Square root
6. Modulus

Ask user to input two number. Now read above operations from file and display on console.
Now get choice from user which operation user want to perform. After operation is applied store the result in same file by using append operation.
Proper code indentation will hold extra marks!

Best of luck ☺

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