QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

Department of computer systems engineering

ASSIGNMENT # 2

Subject: Object Oriented Programming   Batch: 17CS   Submission date: 22-09-2017

I. Write C++ programs along with their output that:

1. Contains a class "**time24**". The class contains **hr**, **mn** and **sec** integer data members. The class should have a constructor to assign initial values, a function to input time from user in 24 Hour format and a function to display time in 24 Hour format. The program should also contain "**time12**" class having proper data members, a casting function to convert the time from 12 Hour (PM/AM) to 24 Hour format. It also has functions to input and display time in 12 Hour format. A main function should call all defined functions by creating the object of both classes.

2. Contains a class "**Complex**". The class contains **real** and **img** integer data members. The class should have a constructor to assign initial values, a function to input the complex number and third function to display data members in proper format. The program should also contain "**Comp**" class inherited from above class. The class should contain proper data members, a function to overload addition and subtraction operator. The main function should call all defined functions by using object of child class.

3. Contains a class "**Record**". The class contains **name, fname, age** and **rollno** as private members. The class contains a constructor to assign initial values and open a file, a destructor to close the file, a function to input the values in private members and store those in "**student.txt**" file, another to retrieve a record from file and last to display all records from file. Main function should use all member functions by creating dynamic object(s) of **Record** class.

4. Contains a class called "**sort**". The class should contain proper private elements including an integer dynamic array having elements of user's choice. Member function to input all values from user and another to display its contents. It also has a friend function to sort elements. The main function should create the object of class sort and call the friend and member functions.

5. Should calculate the impedance of transmission line by using formula $Z = \sqrt{\dfrac{R + j\omega L}{G + j\omega C}}$, where R - resistance, L - impedance, G - conductance, C - capacitance, ω - angular frequency i.e. 2πf where f - frequency. Program should have an abstract class named "impedance" that contains R, L, G, C, f, w and result as protected member variables. A function to input all required values, second function to convert rectangular to polar, third function to return the result after calculating by given formula. Another class "imp" that is inherited from first class, it should have appropriate constructor and destructor. A main function that uses all above functions by creating object(s) of imp class using new and delete operator. **(Hint: use *sqrt* function by including *math* header file)**

II. Complete following exercises from "Object Oriented Programming in C++ by Robert Lafore":

1. Chapter # 6 (pg. 259 – 262)
2. Chapter # 7 (pg. 313 – 317)
3. Chapter # 8 (pg. 367 – 370)
4. Chapter # 9 (pg. 424 – 427)
5. Chapter # 10 (pg. 497 – 501)
6. Chapter # 11 (pg. 561 – 566)

Zuhaib A. Shaikh
(Subject Teacher)