CL-1004
Object Oriented Programming
Lab No 5

Objectives:

- Structures within structures
- Class, object and member functions
- Class private data members

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 **output 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: | (Nested structure, pointers) | 25 Mins

In FAST-NU Faisalabad our Director want to make a Data Base system for student of Computer Science Department. The data base must contain

1) Name of Student

2) Address (House #, Street #, City Name, Province Name).

3) Age

4) GPA

Create a structure of **Student** which must has nested structure of **Address**. Take input for as many students as user wants. Then out put the final data in proper order.

Problem 2: | (Unions) | 15 Min

Write a C++ program for the following problem:

Create a union Person_Record which will contain three members i.e. Name, Address and Phone.

For input purpose, give user the option to enter either name, address, or phone number. If the user chooses to input name set the field to 1, if the user choses to input address set the field to 2 and if the user choses to input phone set field to 3.

Problem 3: | (Class, object and member functions) | 30 Mins

Design a class called Date. The class should store a date in three integers: month, day, and year. There should be member functions to print the date in the following forms:

12/25/10

December 25, 2010

25 December 2010

Demonstrate the class by writing a complete program implementing it.

Note: Do not accept values for the day greater than 31 or less than 1. Do not accept values for the month greater than 12 or less than 1.

Make class diagram of this problem.

Problem 4: (Classes, objects, Private data members, Member functions) | 40 Mins

Write the definition of a class person. Add the following 5 attributes (private) to the person class.

- Name: String
- Age: int
- Male: bool
- Occupation: string
- Cook: bool

Add the following functions to the class:

- setName: sets the name to the passed string
- getName: returns name
- setAge: sets the age to the passed integer
- getAge: returns age
- isMale: returns true if male is true else false
- isFemale: returns false if male is true
- setOccupation: returns a string
- getOccupation: returns a string
- canCook : returns true if cook is true else false

1. Create an object p1 of class person

    Input the values of all attributes in main. Set all the attributes and access all the attributes for p1 object and show the result of each method call in proper form.

2. Now create another object p2 and repeat step

Make class diagram of this problem.

Problem 5: | (Classes, objects, Constructor, Destructor and Member functions) | 40 Mins

Write a class named Employee that has the following member variables:

- name. A string that holds the employee's name.
- idNumber. An int variable that holds the employee's ID number.
- department. A string that holds the name of the department where the employee works.
- position. A string that holds the employee's job title.

The class should have the following constructors:

- A default constructor that assigns empty strings ("") to the name, department, and position member variables, and 0 to the idNumber member variable.

A constructor that accepts the following values as arguments and assigns them to the appropriate member variables: employee's name, employee's ID number, department, and position.

Write appropriate set and get methods to set and retrieve values in these member variable.

Now use these set methods with three different objects to set the class members with the values given below.

Name	ID Number	Department	Position
Waleed Abbid	47899	Accounting	Vice President
Haidar Ali	39119	IT	Programmer
Nouman khaliq	81774	Manufacturing	Engineer

Create three objects and save above value is this members using set() and get() function. Now input data from user for all three objects.

Display the data for each employee on the console using get()and set()method. First display initialized data in objects and then after input from user display all data of three objects.

At the end when you exit your main() and know that your class object is now finish their work then write Destructor that shows a message "I am destructor ".

Make class diagram of this problem.

Proper code indentation will hold extra marks !

Best of luck ☺

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