Object Oriented Paradigm

Lab 04

Topic(s): Destructors, Setters and Getters, This pointer, Object Passing and Returning, Constant Data Members and Functions, Static Data Members and Functions, Composition

IMPORTANT INSTRUCTIONS:

Please keep in mind the following points while coding. Violating any of these will result in credit deduction.

- There should be no memory leakage in your class. There should be no dangling pointers.
- Make functions, objects, variables as constant wherever possible.
- Create Default, Parameterized and Copy Constructor whether mentioned or not.
- Create Setters and Getters for all attributes.
- Follow the appropriate naming conventions as explained in class.
- Submit your files following the submission format explained in class.

Question No. 01

Create a class for complex numbers. A complex number has two parts, one REAL and one IMAGINARY (use both as pointers). Write functions to add, subtract and multiply two complex numbers. Write another function that increments the complex number by adding 1 to its real and imaginary part.

Hint: For addition, subtraction and multiplication, pass an object to the function.

Question No. 02

Create a class Student having data members first name, last name (both character pointers) and a static member variable count to keep track of how many students are instantiated at a given time. The constructor should be parameterized which receives the first name and the last name as its parameters. It should also increment the count number. The destructor should delete the two pointers and also decrement the count. The class should also have static member function which returns the value of count.

In the driver program, access static member function to get count number before any object creation. Create two dynamic objects. Get object count. Delete the objects. Get objects count number at the end which should be zero.

Question No. 03

A class named Employee holds information of the employee comprising of Employee Code (constant), Name, Date of Birth (constant) and Date of Joining (constant). Write a driver program to create at least three objects of employee dynamically and enter some data into it (you may create more than 3 objects, however, at least three of them must be dynamic). Display the names and count of those employees who are older than 30 years.

Question No. 04

A cup of tea consists of Milk, Tea, Sugar and Water. Code this scenario and call the overloaded constructors of the composed classes from the container class.

Question No. 05

A personal computer has a CPU, a motherboard, a RAM, a GPU, an HDD, a Display and a Sound, along with other additional components. Each of these components is an object in itself. Thus, a Personal computer is a complex object composed of several smaller level objects. Each of the smaller objects has its own attributes and functions. For example:

Object	Attributes	Object	Attributes
CPU	Model and Make Frequency Serial Number etc.	**Motherboard**	Model and Make Front Side Bus Built-in options (Sound, modem, VGA, NIC, ...) etc.
RAM	Model and Make Frequency Space Technology etc.	**GPU**	Internal memory Memory type Frequency Bus Interface No of cores etc.
HDD	Model and Make RPM Capacity Buffer	**Sound**	Model and Make No of channels Input Options (analog, digital, MIDI, mic)