cem251/c++

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Laboratory Work: CEM251 - Object-Oriented Programming with C++

Sr. No.	Title of the Practical	CLOs	No. hou allo
1.	a) WAP to find the intersection and union of two arrays of integers given by the user. b)Declare a structure Rectangle having data members as length and breadth . Write main function to initialize rectangle variable at runtime and display area and perimeter of it.	CLO-2	2
2.	a) Write a Program to find Maximum of three floating point numbers (should have double type variable also), three integers, three characters . b) Implement a program to demonstrate the use of call by value and call by reference and an inline function.	CLO-2	2

3.	a) Define a class student having members as stu_id, name, and marks in sub1, sub2 & sub3 Write a C++ program to get information of n students and display them using appropriate member functions. b) Create a class Distance, which accepts data in feet and inches, adds two distances and displays the result in the appropriate form.	CLO-1, CLO-2	4
4.	a).Write a CPP program to add corresponding elements of two 2D matrices using friend function. Create two classes each capable of storing one 2D matrix. Declare the matrix under private access specifier and access them outside the class. b). Create two classes having name Student and Professor which stores student and professor information respectively. Make a friend function comm_name() which finds the common name from both the classes.	CLO-1, CLO-2	2

5.	Create a class MyString which has members as under
	    Data members : 1)To store string length 2) To store the string itself
	    Member functions :
	        1) Default constructors
	        2) Another parameterized Constructor which initialize with string constant
	        3) A copy constructors
	        4) A member function to reverse the case of the string
	        5) A member function to display desired string object.
	        6) Provide destructor to destroy the constructor.
		CLO-1, CLO-2	4

6.			

a). Define a class NewString which stores string. Overload == operator to compare two strings stored in NewString objects. | CLO-1, CLO-2 | 4

b). Create a class Complex. The class should enable operations on complex numbers. Overload multiplication operation to enable multiplication of two complex numbers in algebra.

Hint : Multiply $(1 + 2i)$ and $(2 - 3i)$

Answer:(Here $i^2=-1$)
$(1 + 2i)(2 - 3i) = (1 \times 2) + (1\times (-3i)) + (2i \times 2) + (2i \times (-3i))$
$= 2 - 3i + 4i + 6 = 8 + i$

7.

a) An educational institution wishes to maintain a database of its employees. The database is divided into a number of classes whose hierarchical relationships are as follows: | CLO-1, CLO-2 | 4

Staff (code, name) is the base class; which in turn has Teacher(subject, publication), Typist (speed) and Officer(grade) as its child classes.The Typist again has Regular() and Casual (Daily Wages) as its child classes. Note that the information given in brackets specifies the minimum information required for each class. Specify all classes and define functions to create the database and retrieve information as and when needed.

b) Consider a class student having roll number and supporting methods to get and print the roll number, this class will be inherited by two different classes: test and score that gives the marks in two subjects and marks in sports category respectively.

In final class result (inherits class test and score) find the total marks and print all the data (roll

number, marks in two subjects, marks in sports and total marks). Use the concept of virtual base class.

c) Define a class Figure which initialize the two dimensions, i.e. dim1 and dim2. Define the two classes circle and rectangle which calculates the area of the respective dimensions. With the help of pointer to the base class call the function of both the derived classes.

8.	a). WAP to sort out names stored in an array using pointers. Allocate Memory Dynamically (using new operator). b). Create a base class called Shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific class called Triangle and Rectangle from the base shape. Add to the base class, a member function get_data() to initialize the base class data members and another member function display_area() to compute and display area of figures. Make display_area as a virtual function and redefine this function in derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or rectangle interactively and display the area.	CLO-1, CLO-2	4
9.	Write a program which copies a user-specified text file to another user-specified text file. Take source file and destination file name from command-line arguments.	CLO-1, CLO-2	2
10.	a) Define template class for add, update and traverse operations to implement Queue data structure. Demonstrate the operations on Queue using integer and double types.	CLO-3	4

	b) Write a program to find factorial of a given integer number. Throw multiple exceptions and define multiple catch statements to handle negative number and out of memory exception. Negative number exception thrown if given number is negative value and out of memory exception is thrown if the given number is greater than 20.		
11. *	Declare a class Window having data member as integer x ,y, top and bottom and Title of window and member function as setWindow to set window coordinates and setTitle() to display Title and Draw to draw window. Create 5 window of different size using pointers.	CLO-1, CLO-2	4
12. *	a). WAP which reads a text from the keyboard and displays the following information on the screen in three columns : a) Number of lines b) Number of words c) Number of characters Strings should be left justified and numbers should be right justified in a suitable width. b). WAP to read in a text file and create another file that will accept every sequence of consecutive blank (more than one blank space) spaces is replaced by single space.	CLO-1, CLO-2	4
	Total hours		[3