Lab assignment

CSTE-2102: Object Oriented Programming Lab

1. Write a functions **power()** to raise a number m to a power n. The function takes a double value for m and int value for n, and returns the result correctly. Use a default value of 2 for n to take the function to calculate squares when this argument is omitted. Write a program where **main** function gets the values of m and n from the user to test the function.

2. Write a program to find the largest of three numbers using **inline** function.

3. Consider a shopping list of items for which you place an order with a dealer every month. The list includes details such as the code number and price of each item. You will perform the operations such as adding an item to the list, deleting an item from the list and printing the total value of the order. Write a program to implement these operations using a **class** with arrays as data members.
   [Hints: Balagurusamy, 4th Edition; Page no-109]

4. Write a program to display names, roll number, and grades of 3 students who have appeared in the examination. Declare the class of name, roll number and grade. Create an array of class objects. Read and display the contents of the array.

5. Write a program to perform the addition of time in the hour and minutes format. Use a class **time** and a function **sum( )** that takes two objects as arguments.
   [Hints: Balagurusamy, 4th Edition; Page no-123]

6. Define a class to represent a bank account. Include the following members:
   Data members
   i. Name of the depositor
   ii. Account number
   iii. Type of account
   iv. Balance amount in the account
   Member functions
   i. To assign initial values
   ii. To deposit an amount
   iii. To withdraw an amount after checking the balance
   iv. To display name and balance
   Write a program to implement these operations.

7. Modify the class and the program of the **problem 4** for handling 10 customers.

8. Write a class to represent a vector (a series of float values). Include member functions to perform the following tasks:
   i. To create the vector
   ii. To modify the value of a given element
   iii. To multiply by a scalar value
   iv. To display the vector in the form (10, 20, 30, …)

Write a program to implement these operations.

9. Modify the class and program of the **problem 6** such that the program would be able to add two vectors and display the resultant vector. (You can pass objects as function arguments).

10. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one objects of DM with another object of DB.
    Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which the results are required.
    The display should be in the format of feet and inches or metres and centimeters depending on the objects on display.

11. Consider the long term deposit schemes working in the commercial banks. The banks provide different interest rates for different schemes as well as for different periods of investment. Write a program that contains the class variables (Principal amount, period of investment, Interest rate and Return value of amount) for holding account details and display the principal amount and return value.
    [Hints: Balagurusamy, 4th Edition; Page no-154]

12. A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and display whether it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise the message "Required copies not in stock" is displayed.
    Write a program using a class called **books** with suitable member functions and constructors. Use **new** operator in constructors to allocate memory space required.

13. Write a C++ program to overload +, - and = operators.

14. Write a program to manipulate complex numbers using operator overloading.
    [Hints: Balagurusamy, 4th Edition; Page no-176]

15. Assume that the test results of a batch of students are stored in three different classes. Class **student** stores the roll-number, class **test** stores the marks obtained in two subjects and class **result** contains the total marks obtained in the test. The class **result** can inherit the details of the marks obtained in the test and the roll-number of students through multilevel inheritance.
    Write a program to display the result of a student.
    [Hints: Balagurusamy, 4th Edition; Page no-217]

16. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque

book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed.

Create a class **account** that stores customer name, account number and type of account. From this derive the classes **cur_acct** and **sav_acct** to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

i. Accept deposit from a customer and update the balance.
ii. Display the balance.
iii. Compute and deposit interest.
iv. Permit withdrawal and update the balance.
v. Check for the minimum balance, impose penalty and update the balance.