

OBJECT ORIENTED CONCEPTS AND PROGRAMING
ASSIGNMENT-I
JAN 2020

Note : (1) Programs should have proper validations for the inputs
(2) Use proper variable names
(3) Program should contain program definition as comments and should have proper Indentation

Classes , Objects , Functions , Constructors and Destructors

- (1) Demonstrate the use of **static variables** in a class by using it to count the number of objects created in the program.
- (2) Define a class to represent a **bank account**. Include the following members :

DATA MEMBERS

Name of depositor
Account Number
Type of Account

MEMBER FUNCTIONS

(1) To assign initial values
(2) To Deposit the amount
(3) To withdraw an amount after checking the
Balance amount in account

(4) To display name and balance

Write C++ program to handle 10 customers.

- (3) Create class **STUDENT** having rollno, name and age as data members, also take subject with three subjects and initialize their value with minimum passing marks. Using member function, modify marks of student with specific rollno which is given by user.
- (4) Create a class **Rectangle**. The class has attributes **length** and **width**, each of which defaults to 1. It has member functions that calculate the **perimeter** and the **area** of the rectangle. It has *set* and *get* functions for both length and width. The set functions should verify that **length** and **width** are each floating-point numbers larger than 0.0 and less than 20.0.
- (5) Define a **supplier class**. The class contains details about the suppliers. One of the details is the list of items supplied by the supplier. Create a **class Item** to store item details. The items supplied by any given supplier are different and varying. Use dynamic memory allocation in the constructor function to achieve the solution.
- (6) Define a class **Student**. Add data members as Rollno, Name, Marks_obtained, Max_marks and Percentage. Write member functions for reading values, calculating percentage and printing values of student. Define one more class as **MCA_II**. MCA_II contains array of students. MCA_II class should contain member functions as Add, delete, modify and replace. MCA_II is to be defined as friend of Student class.

- (7) Define a class **Car**. Add data members as Make, Color, Size, and Cost. Write member functions for reading values and printing values of car. Define one more class as **CarCollection**. CarCollection contains array of cars. CarCollection class should contain member functions as Add, delete, modify and replace. CarCollection is to be defined as friend of Car class. Write C++ programs to test your classes.
- (8) Use **Employee** and **EmpCollection** classes. Employee class contains details about employee and EmpCollection contains collection of employees in form of an array. Provide GetSubordinates friend function which returns an object of EmpCollection class which contains details of subordinates of a manager. The employee object describing manager is to be passed as a parameter.
- (9) 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 displays 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 display Design a system using a class called books with suitable member functions and constructors. Include the following features also :
- (a) The number of successful and unsuccessful transaction should be recorded for the purpose of the statistical analysis. Use static data members to keep count of transactions.
 - (b) The price of the books should be updated as and when required. Use a private member function to implement this.
- (10) Write a program to create class 'Search' having data members (int a[], x) and define member functions as void input(), void output(), void search(int position), void add(int value) to display result (Use **New and Delete**).