Program List of OOP. Using C++ Language.

Class & Objects

1. Define a class Birthday having data members name, day, month and year. Accept and display this data for an object.
2. Define a class Time having data members hour, minute and seconds. Accept seconds from user convert it in appropriate hours, minutes and seconds and display it for one object of class.
3. Write a program to declare class Book with book_id, bk_price and author. Define a function to read and display data for it. Read a data for 2 objects and display the information. (using outside the class definition)
4. Define a class Cricket Player with name, country and match score to store a records for 5 last matches, average. Define read, avg and display function for it. Use Outside the class definition and Nesting of member function to call.
5. Write a program to declare a class Employee with emp_id, name and salary with appropriate function. Read this data for 5 employees and display it.
6. Write a program to define a staff having data members as name and post. Accept this data for 5 staffs and display names of staff who are H.O.D.
7. Create a class Furniture with info about F_code, type, Qty & price. Define two objects with name chair, table. Find out which has greater price (using object as a parameter).

Static Members

8. Write a program to count the number of objects of a class. Keep tracking of it using static var.
9. Write a program to define a class having data member's principle, duration and rate of interest. Declare rate_of_interest as static member variable. Calculate the simple interest and display it.
10. Write a program to calculate weight of object at different planets using Formula. Weight= m*g. Where, m = mass of object, g=gravitational force(9.8). Declare g as static member variable.
11. Write a program to define a static member function to display a Welcome message.

Friend Function

12. Modify a program no. 14 using friend function.
13. Define a class person with data name and height. Read information of 2 persons and find out a maximum height in between them.
14. Write a program for swapping content of 2 variables of data of single class.
15. Create two classes test1 and test2 which stores marks of student. Read values for class objects and calculate average of two tests.
16. Create a class DM and DB which stores the value of distance. DM stores distance in mtrs & cmtrs. And DB stores distance in feet and inch. Write a program that read the values of it. And add one object DM with DB with converting value resp. of it.

Returning object.

17. Define a class abc with members x & y. create two objects of it. Define another one object which stores result of average of 2 objects.
18. Define a class Time in form of hr, min & seconds. Create 2 objects of it and store addition of into 3rd object.

Constructors & Destructor

19. Define a class Date which has dd, mm and yy. Write a constructor and display date of Independence Day to user.

20. Define a class fraction, which has numerator and denominator as data members. Write a constructor to initialize value and display fraction.

21. Define a class to represent Bank account. Include following members.

   Data : Name, account number, account type, balance amount. Define a constructor to assign initial values and member function :1 . To deposit an amount. 2. To withdraw an amount.

   3. To Display name and balance.

22. Write a program to declare a class Employee with emp_id, name and salary. Initialize data values with appropriate overloaded constructor for 3 employees and display it also declare destructor to free memory.

23. Write a program to create a class linear having data members var1, var2 to represent a linear equation. $Z=(var1) X + (var2) Y$. use constructor to initialize the data members. Write a function for addition of two linear equations. Display the result.

24. Define a class salary which will contain member variable Basic, TA, DA, HRA. Write a program using constructor with default values for DA and HRA. Also calculate salary of employee.

25. Define a class 'product' with data members product_id, product_name and price. Write a program using Multiple constructor (also include one copy constructor). Accept this data for 3 objects of class and calculate total price of products.
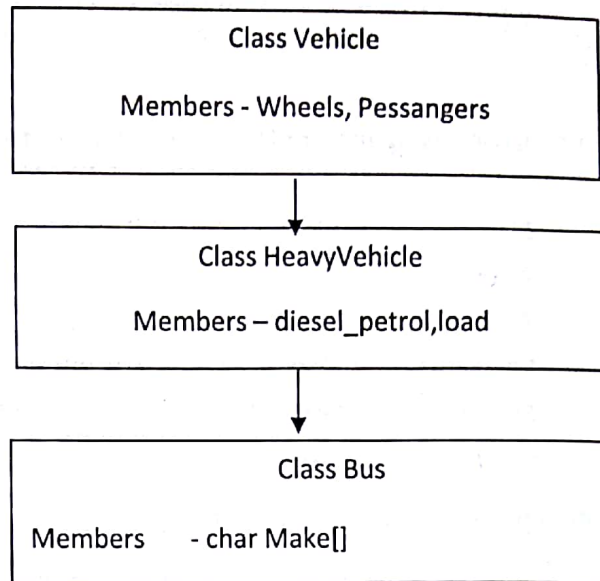
Function Overloading –

26. Write a program to calculate addition of ten integer's numbers. And using another function to add 5 float numbers.

27. Write a program using fun over. To calculate area of different shapes.

28. Define a function to calculate power for different base (2,3 or x).

Operator Overloading

29. Overload the + operator two add two object of a Time class.

30. Overload the unary – operator so that when it is used with an object, the value of numeric data members of the class will be negated.

31. Overload the unary ~ operator to reverse of no which has data of Reverse Class.

32. Overload the + operator so that two strings can be concatenated.

33. Overload unary > operator to compare the height of two persons.

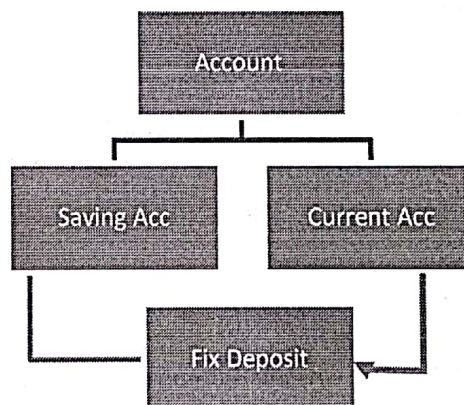34. Modify same programs using friend function between 36 and 40.

35. Create a class student with data member rollno, Name. and inherit class Exam with 3 subject marks, total and percentage. Read the values of Display result with RollNo, Name, Per and Obtained Class.

36. Define Multilevel Inheritance

```
┌─────────────────────────────────────┐
│          Class Vehicle              │
│                                     │
│   Members - Wheels, Pessangers      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│        Class HeavyVehicle           │
│                                     │
│   Members – diesel_petrol,load      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│          Class Bus                  │
│                                     │
│  Members     - char Make[]          │
└─────────────────────────────────────┘
```

37] Define class Publisher and Branch with members (Pubname, Turn Over) & (City, Employees) resp. Create Author with inheritance from it.

38] Hybrid Inheritance

```
                 ┌──────────┐
                 │ Account  │
                 └──────────┘
                      │
          ┌───────────┴───────────┐
          │                       │
    ┌──────────┐            ┌──────────┐
    │ Saving Acc│           │Current Acc│
    └──────────┘            └──────────┘
          │                       │
          └───────┬───────────────┘
                  ▼
            ┌──────────┐
            │Fix Deposit│
            └──────────┘
```

39] Use of Constructor and Overriding Concept. In above program.
Assign values of rollno, name & Marks with the help of constructors. And print details with method overriding - display().

Console I/O

40] Generate output as Follows –

Enter Your String (Upto 20 chars) : RAJ COMPUTERS

R

RAJ

RAJ_C

RAJ_COM

RAJ_COMPU

RAJ_COMPUTE

RAJ_COMPUTERS

41] Write a program using manipulators to display output as given Below.

Roll No	Name	Class
1	Ayush	LKG
2	Ashlesha	Sr.KG.
3	Shriniket	First
4	Shreyas	Second
5	Shalaka	Sixth

42]   Write a program using I/O functions.

2 - - - -4
4 - - - -8
6 - - - 12
8 - - - 16
10 - - 20

Pointers

43] Write a Program to read a name using pointer & check digit is present or not.

44] Write a program to declare a class Box having members as height, width and breadth. Accept information for 4 boxes. Using pointer to array of Objects. Display its Area.

Run Time Polymorphism

45] Create a class Shape. Derive two class triangle and rectangle from class shape. Write appropriate functions in class triangle and rectangle to accept dimensions of triangle and rectangle for calculating area. Here make area() function virtual which is common for all and which will calculate are of triangle and rectangle interactively.

File Handling

46] Create a Text File. Display its content with count no of vowels in it.

47] Create a Database file and Design Menu Driven Program

     1. To Store a Data

     2. To Display all Records

     3. To Display a Specific Records

Templates

48] Create a Class Number with 3 nos. and define a function read and 2 functions for any 2 arithmetic operations. Demonstrate these class handle every type of data (Integer, float, double, long).