OOP using JAVA Practical

(An Integrated Lab with CS350 - OOP using JAVA)

Tentative Programs

OBJECTIVE:

- Design simple java programs using classes, objects, inheritance and polymorphism.
- Experience how inheritance and the code reusability feature works.
- Design and implementation of java programs using Constructors, overloading, type conversion and String handling.
- Design and implementation of programs using Threads and Exception Handling.
- Design and implementation of Simple Applets and experience the working of applets.
- Design and implementation of programs using Java I/O streams.

CYCLE-I

Develop and Execute applications for the following:

1. To generate and print prime numbers for the given range.

2. To find and the roots of a quadratic equation.

3. To print N Fibonacci numbers.

4. To print pyramid shape using * symbols.

5. Define a class to represent a bank ACCOUNT and include the following members:
   I. Data Members(***States***):
      a) Name of Depositor
      b) Account number
      c) Type of Account
      d) Balance amount in the account
   II. Member Methods(***Behaviors***):
      a) To assign initial values
      b) To deposit an amount
      c) To withdraw an amount after checking for the balance
      d) To display name & balance
   III. Define ***EXECUTEACCOUNT*** class that defines main method to test above class.
   IV. In the above class, maintain the total number of account holders present in the bank and also define a method to define it. Change the main method appropriately.
   V. In main method of *EXECUTEACCOUNT* class, define an array to handle five accounts.

VI. In *ACCOUNT* class constructor, demonstrate the use of "this" keyword.

6. The daily maximum temperatures recorded for 5 cities during the first 6 days of January month have to be tabulated. Develop an application to read the data and find the city and day corresponding to highest temperature and lowest temperature.

7. An election is contested by 5 candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate number on the ballot paper. Develop an application to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5, the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballots.

8. Given are two one dimensional array A and B which are sorted in ascending order. Develop an application to merge them into a single sorted array C that contains every item form A and B, in ascending order.

9. Create a class of objects CUBE. Develop an application to read the side for three cubes and print the Volume and outer area.

10. The annual examination results of 20 students are to be tabulated as follows:

Roll No.	Subjec-1	Subject-2	Subject 3

Develop an application to read the data and determine the following:

a) Total marks obtained by each student.

b) The highest marks in each subject and the Roll No. of the student who secured it.

c) The student who obtained the highest total marks.

11. Write a program to read a list containing Book Title, Book Code, Cost and Quantity interactively for min. of 10 books and produce a five column output as shown below.

NAME CODE UNIT PRICE QUANTITY TOTAL PRICE

Define the suitable functions and perform the transactions.

12. Given that an EMPLOYEE class contains the following members:
    Members: Employee ID, Employee Name, Department name & Basic Pay
    Methods: To read each employee details, to calculate Gross Pay and to print the employee details.

Develop an application to read data of N employees and compute the Gross Pay and Net Pay of each employee.

Gross Pay = Basic Pay + DA + HRA (DA = 58% of Basic Pay, HRA = 16% of Basic Pay)
Net Pay = Gross – *Income Tax*

Income Tax calculated as follows:

Gross Pay - Up to 2 lakhs - Nil
Above 2 and up to 3 lakhs - 10% of the Gross Pay
Above 3 and up to 5 lakhs - 15% of the Gross Pay and
Above 5 lakhs 30 % of the Gross Pay, an additional charge of 2% of the tax will be added to total tax

13. Develop an application to find the area and volume of geometrical shapes (like rectangle, triangle, circle, square, cube, cuboids and cylinder by overloading the necessary methods.

14. Develop an application to create a class called COMPLEX and implement following overloaded methods ***ADD*** that returns a complex number:

    I. ADD (a, s2) – where ‘a’ is an integer (real part) and s2 is a complex number *and*

    II. ADD (s1, s2) – where s1 and s2 are complex numbers.