Assignment-3

1. Write a java program to create a class named 'Bank ' with the following data members:
   Name of depositor
   Address of depositor
   Account Number
   Balance in account
   Class 'Bank' has a method for each of the following:
   a. Generate a unique account number for each depositor
      For first depositor, account number will be 1001, for second depositor it will be 1002 and so on
   b. Display information and balance of depositor
   c. Deposit more amount in balance of any depositor
   d. Withdraw some amount from balance deposited
   e. Change address of depositor

   After creating the class, do the following operations

   i. Enter the information (name, address, account number, balance) of the depositors. Number of depositors is to be entered by user.
   ii. Print the information of any depositor.
   iii. Add some amount to the account of any depositor and then display final information of that depositor
   iv. Remove some amount from the account of any depositor and then display final information of that depositor
   v. Change the address of any depositor and then display the final information of that depositor
   vi. Randomly repeat these processes for some other bank accounts.
2. Define a class WordExample having the following description:
   Data members/instance variables:
   private String strdata : to store a sentence.
   Parameterized Constructor
   WordExample(String) : Accept a sentence which may be terminated by either'.', '? 'or '!' only. The words may be separated by more than one blank space and are in UPPER CASE.
   Member Methods:
   void countWord(): Find the number of words beginning and ending with a vowel.
   void placeWord(): Place the words which begin and end with a vowel at the beginning, followed by the remaining words as they occur in the sentence.
3. Write a Java program to create a class called ArrayDemo and overload arrayFunc() function.
   void arrayFunc(int [], int) → To find all pairs of elements in an Array whose sum is equal to a given number :
   Input: Array numbers= [4, 6, 5, -10, 8, 5, 20], target=10
   Output :
   Pairs of elements whose sum is 10 are :

4 + 6 = 10

5 + 5 = 10

-10 + 20 = 10

void arrayFunc(int A[], int p, int B[], int q)→ Given two sorted arrays A and B of size p and q, Overload method arrayFunc() to merge elements of A with B by maintaining the sorted order i.e. fill A with first p smallest elements and fill B with remaining elements.

Example:

Input :

int[] A = { 1, 5, 6, 7, 8, 10 }

int[] B = { 2, 4, 9 }

Output:

Sorted Arrays:

A: [1, 2, 4, 5, 6, 7]

B: [8, 9, 10]

(Use Compile time Polymorphism Method Overloading)

4. Write a java program to calculate the area of a rectangle, a square and a circle. Create an abstract class 'Shape' with three abstract methods namely rectangleArea() taking two parameters, squareArea() and circleArea() taking one parameter each.

   Now create another class 'Area' containing all the three methods rectangleArea(),squareArea() and circleArea() for printing the area of rectangle, square and circle respectively. Create an object of class Area and call all the three methods.

   (Use Runtime Polymorphism)

5. Write a java program to implement abstract class and abstract method with following details:

   Create a abstract Base Class Temperature

   Data members:

   double temp;

   Method members:

   void setTempData(double)

   abstact void changeTemp()

   Sub Class Fahrenheit (subclass of Temperature)

   Data members:

   double ctemp;

   method member:

   Override abstract method changeTemp() to convert Fahrenheit temperature into degree Celsius by using formula C=5/9*(F-32) and display converted temperature

   Sub Class Celsius (subclass of Temperature)

   Data member:

   double ftemp;

   Method member:

   Override abstract method changeTemp() to convert degree Celsius into Fahrenheit temperature by using formula F=9/5*c+32 and display converted temperature

6. Write a java program to create an interface that consists of a method to display volume () as an abstract method and redefine this method in the derived classes to suit their requirements.

Create classes called Cone, Hemisphere and Cylinder that implements the interface. Using these three classes, design a program that will accept dimensions of a cone, cylinder and hemisphere interactively and display the volumes.

Volume of cone = (1/3)πr2h

Volume of hemisphere = (2/3)πr3

Volume of cylinder = πr2h