Java

Concept: Collections Framework

Objective: At the end of the assignment, participants will be able to:

- Create and manage collections
- Differentiate Comparable and Comparator interface

Problems:

1. Create a class **Student** having following members.

   private ArrayList names – Arraylist of String type

   public void setNames() – method to scan names of student and set in names arraylist

   public void searchName(String name) – method to search a student by name

   public void searchName(int index) – method to print student name at an index

   public void printNames( ) – method to print all names using Iterator

   public void removeName(String stuName) – method to delete a name

Create a class **ArrayListDemo** having main method. Create an object of Student class and call all methods.

2. Create a class **Student** having following members:

   private HashMap empNames – HashMap having rollno as key and name as value. Key and value are of type String

   public void setNames( ) – method to set names in HashMap.

   public void printNames( ) – method to print all names

   public void getName(String key) – method to print value of a given key

   public void printNamesKeySet( ) – method to print all values by using keyset of HashMap.

public void printSize( ) – method to print size of HashMap

public void remove(String key) – method to remove a value of a given key

Create a class **TestHashMap** having main method. Create an object of Employee class and perform different operations on it.

3. Create a class **TestTreeSet** having main method. Perform following functionality:
    - Create a TreeSet having name Product of type String.
    - Store different product names. Try to add duplicate product names.
    - Print all product names using iterator.
    - Print the first and last product names
    - Print the size of TreeSet
    - Remove a particular product from TreeSet
    - Again verify the size of TreeSet

4. Create a class **Student** which should implement **Comparable** interface of type Student having following members:

    private int rollNo;

    private String name;

    Include a parameterized constructor to initialize instance variables

    Add Getter methods for all instance variables

    Override toString( ) to return rollNo and name

    Override compareTo( ) to compare names of student

    Create a class **StudentSortDemo** having main method.

    - Create an array list of type Student.
    - Store 5 student data in arraylist.
    - Print all student data. Observe the unsorted data.
    - Call the sort ( ) of Collections class to sort student data
    - Again print all student data. Observe the sorted data.

5. Modify assignment #4 to implement **Comparator** interface of type **Student.** Override the compare( ) method to compare names of student.