**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.

1. 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.

1. 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

1. 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.

1. Modify assignment #4 to implement **Comparator** interface of type **Student.**

Override the compare( ) method to compare names of student.