Lab Work 11

1. (Generic linear search) Implement the following generic method for linear search.

*public static <E extends Comparable<E>> int linearSearch(E[] list, E key)*

1. (Maximum element in an array) Implement the following method that returns the maximum element in an array.

*public static <E extends Comparable<E>> E max(E[] list)*

1. (Largest element in ArrayList) Write the following method that returns the largest element in an ArrayList:

*public static <E extends Comparable<E>> E max(ArrayList<E> list)*

1. (Distinct elements in ArrayList) Write the following method that returns a new *ArrayList*. The new list contains the non-duplicate elements from the original list.

*public static <E> ArrayList<E> removeDuplicates(ArrayList<E> list)*

1. (Sort points in a plane) Write a program that meets the following requirements:

* Define a class named Point with two data fields x and y to represent a point’s x- and y-coordinates. Implement the Comparable interface for com- paring the points on x-coordinates. If two points have the same x-coordinates, compare their y-coordinates.
* Define a class named CompareY that implements Comparator<Point>. Implement the compare method to compare two points on their y-coordinates. If two points have the same y-coordinates, compare their x-coordinates.
* Randomly create 100 points and apply the Arrays.sort method to display the points in increasing order of their x-coordinates and in increasing order of their y-coordinates, respectively.

1. (Use iterators on linked lists) Write a test program that stores 1 million integers in a linked list and test the time to traverse the list using an iterator vs. using the get(index) method.