Name: Badal Wanjari

Branch: Computer Technology

Section: B

Roll No. 140

Registration No. 20011045

Subject: Object Oriented Programming Lab

Practical-7

- **Problem Definition:**

1. Write a program to store the roll no. and name of the student int the HashMap. Then convert the name field into ArrayList and roll no. into TreeSet. Display the HashMap and then ArrayList and TreeSet separately.
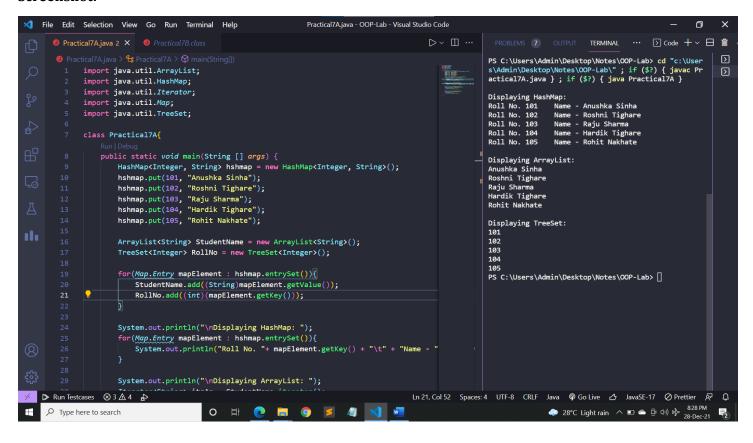
Program:

```java
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Iterator;
import java.util.Map;
import java.util.TreeSet;

class Practical7A{
    public static void main(String [] args) {
        HashMap<Integer, String> hshmap = new HashMap<Integer, String>();
        hshmap.put(101, "Anushka Sinha");
        hshmap.put(102, "Roshni Tighare");
        hshmap.put(103, "Raju Sharma");
        hshmap.put(104, "Hardik Tighare");
        hshmap.put(105, "Rohit Nakhate");

        ArrayList<String> StudentName = new ArrayList<String>();
        TreeSet<Integer> RollNo = new TreeSet<Integer>();

        for(Map.Entry mapElement : hshmap.entrySet()){
            StudentName.add((String)mapElement.getValue());
            RollNo.add((int)(mapElement.getKey()));
        }

        System.out.println("\nDisplaying HashMap: ");
```

```java
        for(Map.Entry mapElement : hshmap.entrySet()){
            System.out.println("Roll No. "+ mapElement.getKey() + "\t" + "Name - "+
mapElement.getValue());
        }

        System.out.println("\nDisplaying ArrayList: ");
        Iterator<String> itrAr = StudentName.iterator();
        while(itrAr.hasNext()){
            System.out.println(itrAr.next());
        }

        System.out.println("\nDisplaying TreeSet: ");
        Iterator<Integer> itrTs = RollNo.iterator();
        while(itrTs.hasNext()){
            System.out.println(itrTs.next());
        }
    }
}
```

Output:

```
Displaying HashMap:
Roll No. 101   Name - Anushka Sinha
Roll No. 102   Name - Roshni Tighare
Roll No. 103   Name - Raju Sharma
Roll No. 104   Name - Hardik Tighare
Roll No. 105   Name - Rohit Nakhate

Displaying ArrayList:
Anushka Sinha
Roshni Tighare
Raju Sharma
Hardik Tighare
Rohit Nakhate

Displaying TreeSet:
101
102
103
104
105
```

Screenshot:

2. Create the HashMap of roll no and value as the list of marks in 5 subjects. Store the total of marks in five subjects of each student in the separate ArrayList and display both the HashMap and ArrayList of total marks.

Program:

```java
import java.util.HashMap;
import java.util.*;
import java.util.ArrayList;
public class Practical7B {
    public static void main(String [] args){
        HashMap<Integer , int []> hshmap = new HashMap<Integer, int []>();
        ArrayList<Integer> totalMark = new ArrayList<Integer>();

        int roll_no_1 = 101;
        int [] marks_1 = {99, 78, 66, 89, 85};
        hshmap.put(roll_no_1, marks_1);

        int roll_no_2 = 102;
        int [] marks_2 = {89, 78, 76, 80, 71};
```

```
        hshmap.put(roll_no_2, marks_2);

        int roll_no_3 = 103;
        int [] marks_3 = {99, 85, 96, 89, 95};
        hshmap.put(roll_no_3, marks_3);


        for(Map.Entry mapElement: hshmap.entrySet()){
            int [] marks = (int[])mapElement.getValue();
            int temp=0;
            for(int i=0;i<5;i++){
                temp += marks[i];
            }
            totalMark.add(temp);
        }

        System.err.println("Displaying HashMap : ");
        for(Map.Entry mpElement: hshmap.entrySet()){
            System.out.println("Roll No." + mpElement.getKey());
            int [] temp = (int [])mpElement.getValue();
            for(int i=0;i<5;i++){
                System.out.println("Mark in subject-" + (i+1) + " = " + temp[i]);
            }
            System.out.println();
        }

        System.out.println("Displaying ArrayList containing Total Marks");
        Iterator<Integer> itr = totalMark.iterator();
        while(itr.hasNext()){
            System.out.println(itr.next());
        }
    }
}
```

Output:

```
Displaying HashMap :
Roll No.101
Mark in subject-1 = 99
Mark in subject-2 = 78
Mark in subject-3 = 66
Mark in subject-4 = 89
Mark in subject-5 = 85

Roll No.102
Mark in subject-1 = 89
Mark in subject-2 = 78
```

```
Mark in subject-3 = 76
Mark in subject-4 = 80
Mark in subject-5 = 71


Roll No.103
Mark in subject-1 = 99
Mark in subject-2 = 85
Mark in subject-3 = 96
Mark in subject-4 = 89
Mark in subject-5 = 95


Displaying ArrayList containing Total Marks
417
394
464
```

Screenshot:

- **Result:**

By studying implementation of concept collection classes in Java, I have successfully completed Practical-7.