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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 into the HashMap. Then convert the name field into ArrayList and roll no. into TreeSet. Display the HashMap and then ArrayList and TreeSet separately.

Program:

```
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: ");
```

```

        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

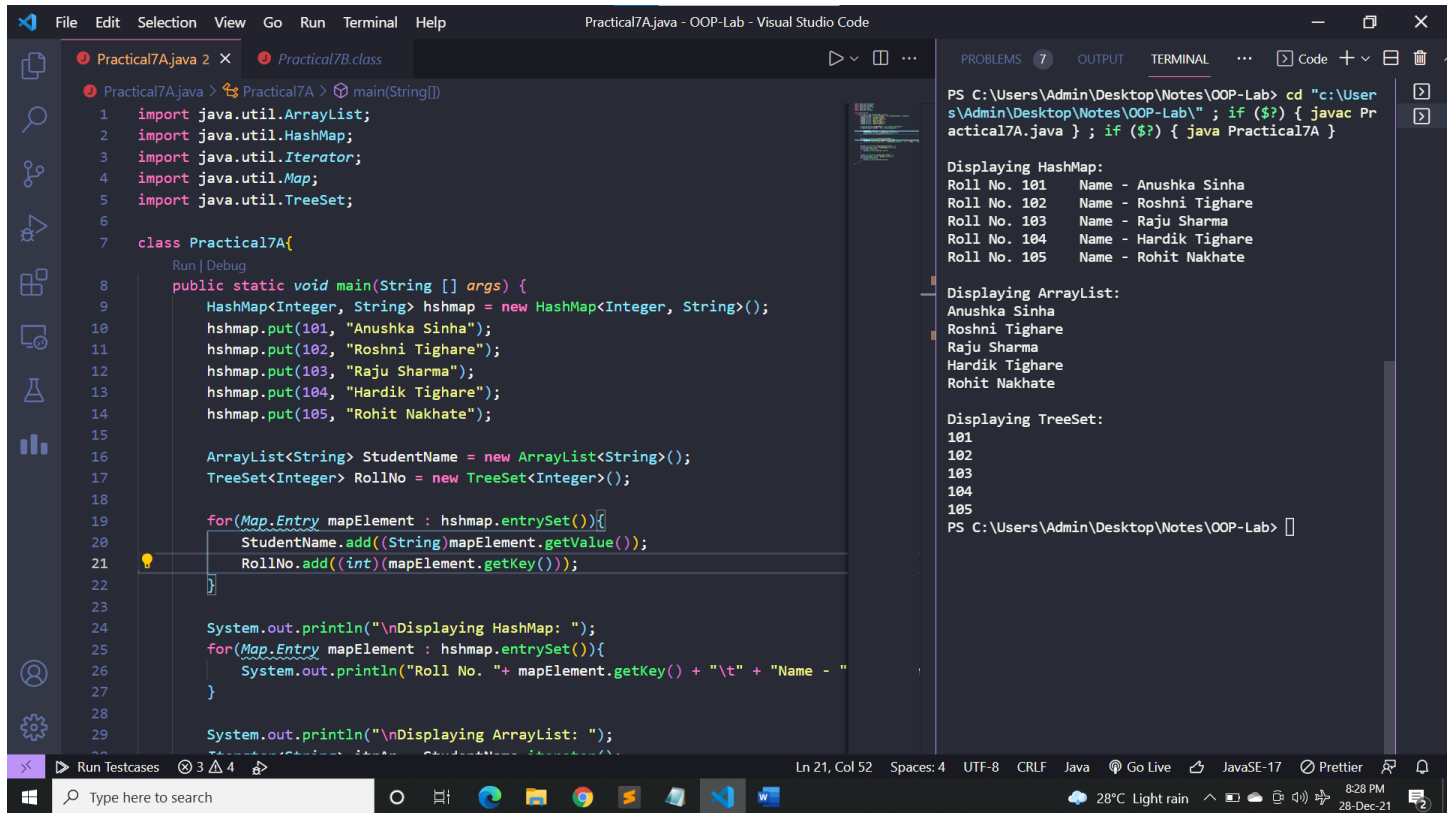
Displaying ArrayList:

Anushka Sinha
Roshni Tighare
Raju Sharma
Hardik Tighare
Rohit Nakhate

Displaying TreeSet:

101
102
103
104
105

Screenshot:



```
File Edit Selection View Go Run Terminal Help
Practical7A.java - OOP-Lab - Visual Studio Code

Practical7A.java x Practical7B.class
Practical7A.java > Practical7A > main(String[])
1 import java.util.ArrayList;
2 import java.util.HashMap;
3 import java.util.Iterator;
4 import java.util.Map;
5 import java.util.TreeSet;
6
7 class Practical7A{
8     public static void main(String [] args) {
9         HashMap<Integer, String> hshmap = new HashMap<Integer, String>();
10        hshmap.put(101, "Anushka Sinha");
11        hshmap.put(102, "Roshni Tighare");
12        hshmap.put(103, "Raju Sharma");
13        hshmap.put(104, "Hardik Tighare");
14        hshmap.put(105, "Rohit Nakhate");
15
16        ArrayList<String> StudentName = new ArrayList<String>();
17        TreeSet<Integer> RollNo = new TreeSet<Integer>();
18
19        for(Map.Entry mapElement : hshmap.entrySet()){
20            StudentName.add((String)mapElement.getValue());
21            RollNo.add((int)(mapElement.getKey()));
22        }
23
24        System.out.println("\nDisplaying HashMap: ");
25        for(Map.Entry mapElement : hshmap.entrySet()){
26            System.out.println("Roll No. " + mapElement.getKey() + "\t" + "Name - "
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29        System.out.println("\nDisplaying ArrayList: ");
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```

```

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:

The screenshot displays the Visual Studio Code editor with a Java file named `Practical7B.java`. The code defines a `HashMap` to store marks for three students (Roll Nos. 101, 102, and 103) across five subjects. It then iterates through the map to calculate the total marks for each student and displays them in an `ArrayList`.

```
1 import java.util.HashMap;
2 import java.util.*;
3 import java.util.ArrayList;
4 public class Practical7B {
5     public static void main(String [] args){
6         HashMap<Integer , int []> hshmap = new HashMap<Integer, int []>();
7         ArrayList<Integer> totalMark = new ArrayList<Integer>();
8
9         int roll_no_1 = 101;
10        int [] marks_1 = {99, 78, 66, 89, 85};
11        hshmap.put(roll_no_1, marks_1);
12
13        int roll_no_2 = 102;
14        int [] marks_2 = {89, 78, 76, 80, 71};
15        hshmap.put(roll_no_2, marks_2);
16
17        int roll_no_3 = 103;
18        int [] marks_3 = {99, 85, 96, 89, 95};
19        hshmap.put(roll_no_3, marks_3);
20
21
22        for(Map.Entry mapElement: hshmap.entrySet()){
23            int [] marks = (int[])mapElement.getValue();
24            int temp=0;
25            for(int i=0;i<5;i++){
26                temp += marks[i];
27            }
28            totalMark.add(temp);
29        }
30    }
31 }
```

The terminal output shows the execution results for each roll number and the final total marks for each student:

```
PS C:\Users\Admin\Desktop\Notes\OOP-Lab> cd "c:\Users\Admin\Desktop\Notes\OOP-Lab"; if ($?) { javac Practical7B.java }; if ($?) { java Practical7B }
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
PS C:\Users\Admin\Desktop\Notes\OOP-Lab>
```

- Result:**

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