

# Rajalakshmi Engineering College

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Branch: REC

Department: IT - Section 2

Batch: 2028

Degree: B.E - IT

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 10\_MCQ

Attempt : 1

Total Mark : 15

Marks Obtained : 15

#### Section 1 : MCQ

1. What will happen if you add elements in descending order in a TreeSet?

**Answer**

They are sorted in ascending order

**Status : Correct**

**Marks : 1/1**

2. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("X", 10);
        map.put("Y", 20);
```

```
map.put("Z", 30);  
map.remove("Y");  
System.out.println(map);  
}  
}
```

**Answer**

{X=10, Z=30}

**Status :** Correct

**Marks :** 1/1

3. Which statement is true about HashSet and TreeSet?

**Answer**

TreeSet provides sorted elements

**Status :** Correct

**Marks :** 1/1

4. Which of the following is true about TreeMap?

**Answer**

It maintains natural ordering

**Status :** Correct

**Marks :** 1/1

5. How does HashSet check for duplicate elements?

**Answer**

Using equals() and hashCode()

**Status :** Correct

**Marks :** 1/1

6. What is the time complexity of retrieving an element from a HashSet?

**Answer**

O(1)

**Status :** Correct

**Marks :** 1/1

7. Which method retrieves the lowest key in a TreeMap?

**Answer**

firstKey()

**Status :** Correct

**Marks :** 1/1

8. What will happen if you add a null element to a TreeSet?

**Answer**

An exception occurs

**Status :** Correct

**Marks :** 1/1

9. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, String> map = new HashMap<>();
        map.put("A", "Apple");
        map.put("B", "Banana");
        map.put("C", "Cherry");
        map.replace("B", "Blueberry");
        System.out.println(map);
    }
}
```

**Answer**

{A=Apple, B=Blueberry, C=Cherry}

**Status :** Correct

**Marks :** 1/1

10. What happens if two keys have the same hash code in a HashMap?

**Answer**

A linked list is used to store values with the same hash

**Status :** Correct

**Marks :** 1/1

11. Which method removes all elements from a Set?

**Answer**

clear()

**Status :** Correct

**Marks :** 1/1

12. Which of the following is true about HashMap?

**Answer**

It is not synchronized

**Status :** Correct

**Marks :** 1/1

13. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("A", 1);
        map.put("B", 2);
        map.put("C", 3);
        System.out.println(map.containsKey("B"));
    }
}
```

**Answer**

true

**Status :** Correct

**Marks :** 1/1

14. Which of the following allows null keys in Java?

**Answer**

HashMap

**Status :** Correct

**Marks :** 1/1

15. What happens when you add duplicate elements to a HashSet?

**Answer**

The duplicate is ignored

**Status :** Correct

**Marks :** 1/1

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 10\_Q1

Attempt : 1

Total Mark : 10

Marks Obtained : 10

#### Section 1 : COD

##### 1. Problem Statement

A city traffic management system needs to track vehicles entering a toll booth. Each vehicle is uniquely identified by its registration number. The system should allow adding vehicles to a record, ensuring that no duplicate registration numbers exist. The vehicles should be stored in a HashSet, which does not guarantee any specific order.

Your task is to implement a program using a HashSet that allows adding vehicle details and displaying the records.

##### ***Input Format***

The first line of input contains an integer N - the number of vehicles.

The next N lines contain details of each vehicle in the format: "RegNumber

OwnerName VehicleType"

1. RegNumber (String) - A unique registration number (Alphanumeric).
2. OwnerName (String) - The name of the vehicle owner.
3. VehicleType (String, Car, Bike, or Truck) - The type of vehicle.

If a vehicle with the same registration number is already present, ignore the duplicate entry.

### **Output Format**

The output prints the unique vehicle records in any order (since HashSet does not maintain order).

Output format: "RegNumber OwnerName VehicleType"

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

KA01AB1234 John Car

MH02CD5678 Alice Bike

DL03EF9012 Bob Truck

TN04GH3456 Mike Car

KA01AB1234 John Car

Output: TN04GH3456 Mike Car

KA01AB1234 John Car

MH02CD5678 Alice Bike

DL03EF9012 Bob Truck

### **Answer**

```
// You are using Java
import java.util.HashSet;
import java.util.Scanner;
import java.util.Objects;
```

```
class Vehicle
```

```
{
```

```
    String regNumber;
```

```
    String ownerName;
```

```

String vehicleType;

public Vehicle(String regNumber,String ownerName,String vehicleType)
{
    this.regNumber=regNumber;
    this.ownerName=ownerName;
    this.vehicleType=vehicleType;
}
@Override
public String toString()
{
    return this.regNumber + " " + this.ownerName + " " + this.vehicleType;
}
@Override
public boolean equals(Object obj)
{
    if(this == obj)
    {
        return true;
    }
    if(obj == null || getClass() != obj.getClass())
    {
        return false;
    }
    Vehicle otherVehicle = (Vehicle) obj;

    return Objects.equals(this.regNumber, otherVehicle.regNumber);
}
@Override
public int hashCode()
{
    return Objects.hash(this.regNumber);
}
}
public class Main
{
    public static void main(String[] arg)
    {
        Scanner scanner=new Scanner(System.in);
        int n=scanner.nextInt();

        HashSet<Vehicle> vehicleSet = new HashSet<>();
    }
}

```

```
for(int i=0;i<n;i++)
{
    String regNum=scanner.next();
    String owner=scanner.next();
    String type=scanner.next();

    Vehicle vehicle = new Vehicle(regNum,owner,type);
    vehicleSet.add(vehicle);
}
for(Vehicle v:vehicleSet)
{
    System.out.println(v);
}
}
```

**Status :** Correct

**Marks :** 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 10\_Q2

Attempt : 1

Total Mark : 10

Marks Obtained : 10

#### Section 1 : COD

##### 1. Problem Statement

John is organizing a fruit festival, and the quantities of various fruits are stored in a HashMap where fruit names are keys and quantities are values.

Help him develop a program to find the total quantity of fruits for the festival by summing up the values in the HashMap.

##### ***Input Format***

The input consists of fruit quantities in the format 'fruitName:quantity', where fruitName is the name of the fruit(a string), and quantity is a double value representing the quantity.

The input is terminated by entering "done".

##### ***Output Format***

The output prints a double value, representing the sum of values in the HashMap, rounded off to two decimal places.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are entered, print "Invalid format".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: Banana:15.2

Orange:56.3

Mango:47.3

done

Output: 118.80

### **Answer**

// You are using Java

```
import java.util.Scanner;
```

```
import java.util.HashMap;
```

```
import java.util.Map;
```

```
public class Main
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        Scanner scanner=new Scanner(System.in);
```

```
        Map<String , Double> fruitMap=new HashMap<>();
```

```
        while(true)
```

```
        {
```

```
            String line=scanner.nextLine();
```

```
            if(line.equals("done"))
```

```
            {
```

```
                break;
```

```
            }
```

```
            if(!line.contains(":"))
```

```
            {
```

```
        System.out.println("Invalid format");
        return;
    }

    String[] parts = line.split(":",2);
    String fruitName=parts[0];
    String quantityString = parts[1];

    try
    {
        double quantity=Double.parseDouble(quantityString);
        fruitMap.put(fruitName, quantity);
    }
    catch(NumberFormatException e)
    {
        System.out.println("Invalid input");
        return;
    }
}
double totalQuantity = 0.0;
for(double qty : fruitMap.values())
{
    totalQuantity += qty;
}
System.out.printf("%.2f\n",totalQuantity);
}
}
```

**Status :** Correct

**Marks :** 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 10\_Q3

Attempt : 1

Total Mark : 10

Marks Obtained : 10

#### Section 1 : COD

##### 1. Problem Statement

Priya is analyzing encrypted messages in a research project. She wants to analyze the frequency of each character in a given paragraph. The characters should be stored in a TreeMap so that the output is sorted in ascending order of characters automatically.

You are required to build a Java program that:

Uses a `TreeMap<Character, Integer>` to count how many times each character appears in the message. Ignores spaces and considers only alphabets (case-sensitive). Outputs the frequencies of characters in sorted order.

You must use a TreeMap in the class named MessageAnalyzer.

**Input Format**

The first line of input contains an integer n, the number of lines in the message.

The next n lines each contain a string (the encrypted message line).

### **Output Format**

The first line of output prints: "Character Frequency:"

Then print each character and its frequency in the format: "<character>: <count>"

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 2  
Hello World  
Java

Output: Character Frequency:

H: 1

J: 1

W: 1

a: 2

d: 1

e: 1

l: 3

o: 2

r: 1

v: 1

### **Answer**

```
// You are using Java
import java.util.Scanner;
import java.util.TreeMap;
import java.util.Map;
```

```
class MessageAnalyzer
{
    private Map<Character, Integer> charFrequency;
    public MessageAnalyzer()
    {
        this.charFrequency = new TreeMap<>();
    }
}
```

```

    }
    public void analyzeMessage(String message)
    {
        for(char c: message.toCharArray())
        {
            if(Character.isLetter(c))
            {
                int count = charFrequency.getOrDefault(c,0);
                charFrequency.put(c, count+1);
            }
        }
    }
    public void displayFrequencies()
    {
        System.out.println("Character Frequency:");
        for(Map.Entry<Character,Integer> entry : charFrequency.entrySet())
        {
            System.out.println(entry.getKey() + ": " + entry.getValue());
        }
    }
}
public class Main
{
    public static void main(String[] arg)
    {
        Scanner scanner=new Scanner(System.in);
        MessageAnalyzer analyzer = new MessageAnalyzer();
        int n=scanner.nextInt();
        scanner.nextLine();

        for(int i=0;i<n;i++)
        {
            String line = scanner.nextLine();
            analyzer.analyzeMessage(line);
        }
        analyzer.displayFrequencies();
    }
}

```

Status : Correct

Marks : 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 10\_Q4

Attempt : 1

Total Mark : 10

Marks Obtained : 10

#### Section 1 : COD

##### 1. Problem Statement

In a ticket reservation system, you store the available seat numbers in a TreeSet. Users input their desired seat number, and the program checks whether the chosen seat is available.

Using a TreeSet ensures quick and efficient verification of seat availability, ensuring a smooth and organized ticket booking process.

##### ***Input Format***

The first line of input contains a single integer  $n$ , representing the number of available seats.

The second line contains  $n$  space-separated integers, representing the available seat numbers.

The third line contains an integer m, representing the seat number that needs to be searched.

### **Output Format**

The output displays "[m] is present!" if the given seat is available. Otherwise, it displays "[m] is not present!"

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 4

2 4 5 6

5

Output: 5 is present!

### **Answer**

// You are using Java

import java.util.Scanner;

import java.util.TreeSet;

public class Main

{

    public static void main(String[] arg)

    {

        Scanner sc = new Scanner(System.in);

        int n=sc.nextInt();

        TreeSet<Integer> availableSeats = new TreeSet<>();

        for(int i=0;i<n;i++)

        {

            availableSeats.add(sc.nextInt());

        }

        int m=sc.nextInt();

        if(availableSeats.contains(m))

        {

            System.out.println(m+ " is present!");

        }

        else

        {

            System.out.println(m+" is not present!");

241001194  
}  
}  
}

Status : Correct

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Marks : 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 10\_PAH

Attempt : 1

Total Mark : 30

Marks Obtained : 30

### Section 1 : Coding

#### 1. Problem Statement

A university maintains a list of student records and wants to store them in a sorted manner based on their GPA. If two students have the same GPA, they should be further sorted by their name in lexicographical order. Implement a program that uses a TreeSet to store student records and ensures unique student IDs.

#### ***Input Format***

The first line contains an integer N - the number of students.

The next N lines contain details of each student in the format: "StudentID Name GPA"

- StudentID (Integer) - A unique identifier.
- Name (String) - The student's name (can contain spaces).

- GPA (Double) - The Grade Point Average.

### **Output Format**

The output prints the list of students in ascending order of GPA.

If two students have the same GPA, sort them by name.

Print details in the format: "StudentID Name GPA" in the output, GPA is rounded to two decimal places.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

101 John 8.5

102 Alice 9.1

103 Bob 8.5

104 Zoe 7.3

105 Charlie 9.1

Output: 104 Zoe 7.30

103 Bob 8.50

101 John 8.50

102 Alice 9.10

105 Charlie 9.10

### **Answer**

```
// You are using Java
import java.util.Scanner;
import java.util.TreeSet;
```

```
class Student implements Comparable<Student>
{
    int id;
    String name;
    double gpa;

    public Student(int id,String name,double gpa)
    {
        this.id = id;
```

```

        this.name=name;
        this.gpa=gpa;
    }
    @Override
    public int compareTo(Student other)
    {
        int gpaCompare=Double.compare(this.gpa,other.gpa);
        if(gpaCompare != 0)
        {
            return gpaCompare;
        }
        else
        {
            return this.name.compareTo(other.name);
        }
    }
    @Override
    public String toString()
    {
        return String.format("%d %s %.2f", this.id,this.name,this.gpa);
    }
}
public class Main
{
    public static void main(String[] arg)
    {
        Scanner sc=new Scanner(System.in);

        int n=sc.nextInt();
        sc.nextLine();

        TreeSet<Student> students = new TreeSet<>();

        for(int i=0;i<n;i++)
        {
            String line = sc.nextLine();
            int firstSpace = line.indexOf(' ');
            int lastSpace = line.lastIndexOf(' ');

            int id = Integer.parseInt(line.substring(0, firstSpace));
            String name=line.substring(firstSpace + 1, lastSpace);
            double gpa = Double.parseDouble(line.substring(lastSpace + 1));

```

```
        students.add(new Student(id,name,gpa));
    }
    for(Student s: students)
    {
        System.out.println(s);
    }
}
```

**Status :** Correct

**Marks :** 10/10

## 2. Problem Statement

Sarah is working on a spam detection system that analyzes incoming messages for unique patterns. Spammers often use repetitive character sequences, making it important to identify the first non-repeating character in a message.

Given a string, Sarah needs to determine the first character that appears only once. If all characters repeat, the system should return -1.

She decides to use a HashMap to efficiently track character frequencies and find the solution.

### **Input Format**

The first line contains an integer N representing , the length of the string.

The second line contains a string of N lowercase English letters (a-z).

### **Output Format**

The output prints a character representing the first non-repeating character. If none exist, print -1.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 10  
abacabadac

Output: d

**Answer**

// You are using Java

```
import java.util.Scanner;
```

```
import java.util.HashMap;
```

```
public class Main
```

```
{
```

```
    public static void main(String[] arg)
```

```
    {
```

```
        Scanner sc=new Scanner(System.in);
```

```
        int n=sc.nextInt();
```

```
        String s=sc.next();
```

```
        HashMap<Character, Integer>charCounts=new HashMap<>();
```

```
        for(char c:s.toCharArray())
```

```
        {
```

```
            charCounts.put(c, charCounts.getOrDefault(c, 0)+1);
```

```
        }
```

```
        boolean found=false;
```

```
        for( char c:s.toCharArray())
```

```
        {
```

```
            if(charCounts.get(c)==1)
```

```
            {
```

```
                System.out.println(c);
```

```
                found=true;
```

```
                break;
```

```
            }
```

```
        }
```

```
        if(!found)
```

```
        {
```

```
            System.out.println("-1");
```

```
        }
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

### 3. Problem Statement

Riya is building a calendar event scheduler where each event is stored in chronological order using a TreeMap. The key represents the event time in 24-hour format (HH:MM), and the value is the event description.

She wants the system to:

Automatically sort events by time. Avoid duplicate time entries — if a duplicate time is entered, ignore the new entry. Print all scheduled events in order.

Implement this logic using a class named EventManager.

#### ***Input Format***

The first line of the input contains an integer  $n$ , representing the number of events.

The next  $n$  lines each contain a string in the format: "HH:MM Description"

(Example: 09:00 TeamMeeting).

#### ***Output Format***

The first line of the output prints "Scheduled Events:"

The next  $k$  lines print each event in the format: "HH:MM - Description"

Refer to the sample output for formatting specifications.

#### ***Sample Test Case***

Input: 5

09:00 TeamMeeting

13:30 LunchBreak

11:00 ProjectUpdate

09:00 Standup

15:00 ClientCall

Output: Scheduled Events:

09:00 - TeamMeeting

11:00 - ProjectUpdate  
13:30 - LunchBreak  
15:00 - ClientCall

**Answer**

```
// You are using Java
import java.util.Scanner;
import java.util.TreeMap;
import java.util.Map;

class EventManager
{
    private TreeMap<String, String>events;
    public EventManager()
    {
        this.events = new TreeMap<>();
    }
    public void addEvent(String time,String description)
    {
        events.putIfAbsent(time,description);
    }
    public void printEvents()
    {
        System.out.println("Scheduled Events:");
        for(Map.Entry<String, String> entry : events.entrySet())
        {
            System.out.println(entry.getKey() + " - " + entry.getValue());
        }
    }
}

public class Main
{
    public static void main(String[] arg)
    {
        Scanner sc=new Scanner(System.in);

        EventManager scheduler = new EventManager();
        int n=sc.nextInt();
        for(int i =0; i<n;i++)
        {
```

```
String time=sc.next();
String description = sc.next();

    scheduler.addEvent(time, description);
}
scheduler.printEvents();
}
}
```

**Status :** Correct

**Marks : 10/10**

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 10\_CY

Attempt : 1  
Total Mark : 40  
Marks Obtained : 40

#### Section 1 : COD

##### 1. Problem Statement

Tony is an e-learning platform administrator, he oversees the user ratings for various online courses offered in the platform.

To enhance user experience, you should assist him in utilizing a HashMap to store course ratings given by learners. Regularly, he analyzes this data to identify the highest and lowest-rated courses, enabling targeted improvements and ensuring the quality of the educational content. This process assists in maintaining a competitive and engaging online learning environment for the users.

##### ***Input Format***

The input consists of a string representing the course name followed by a double value representing the course's rating, in separate lines.

The input is terminated by entering "done".

### **Output Format**

The first line of output prints the string "Highest Rated Course: " followed by the highest-rated course.

The second line prints the string "Lowest Rated Course: " followed by the lowest-rated courses.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: DSA

4.0

OOPS

4.2

C

3.2

done

Output: Highest Rated Course: OOPS

Lowest Rated Course: C

### **Answer**

```
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;

// You are using Java
class CourseAnalyzer {
    //type your code here
    public Map<String, String>
    identifyHighestAndLowestRatedCourses(Map<String, Double > courseRatings)
    {
        double minRating = 6.0;
        double maxRating = -1.0;

        String lowestRatedCourse = "";
        String highestRatedCourse = "";
```

```

for(Map.Entry<String, Double> entry : courseRatings.entrySet())
{
    String courseName = entry.getKey();
    double rating = entry.getValue();

    if(rating > maxRating)
    {
        maxRating = rating;
        highestRatedCourse = courseName;
    }
    if(rating < minRating)
    {
        minRating=rating;
        lowestRatedCourse = courseName;
    }
}
Map<String, String> result = new HashMap<>();
result.put("highest", highestRatedCourse);
result.put("lowest",lowestRatedCourse);

return result;
}
}

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Map<String, Double> courseRatings = new HashMap<>();

        while (true) {
            String courseName = scanner.nextLine();
            if (courseName.equalsIgnoreCase("done")) {
                break;
            }
            double rating = Double.parseDouble(scanner.nextLine().trim());
            courseRatings.put(courseName, rating);
        }

        CourseAnalyzer analyzer = new CourseAnalyzer();
        Map<String, String> result =
        analyzer.identifyHighestAndLowestRatedCourses(courseRatings);
    }
}

```

```
System.out.printf("Highest Rated Course: %s\n", result.get("highest"));
System.out.printf("Lowest Rated Course: %s", result.get("lowest"));

    scanner.close();
}
}
```

**Status :** Correct

**Marks :** 10/10

## 2. Problem Statement

Bob wants to develop a score-tracking application for a gaming tournament. Each player's score is stored in a HashMap with the player's name as the key and the score as the value.

Write a program to assist Bob that takes user input to enter player scores, calculates the maximum score from the HashMap, and prints the player with the highest score.

### **Input Format**

The input consists of strings representing player details in the format "playerName:score".

The input is terminated by entering "done".

### **Output Format**

The output displays a string, representing the player's name who scored the maximum.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are given, print "Invalid format".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: Alice:15

Bob:56

done

Output: Bob

### **Answer**

```
import java.util.*;

// You are using Java
class ScoreTracker {
    //type your code here
    public HashMap<String, Integer> scoreMap;
    public ScoreTracker()
    {
        scoreMap = new HashMap<>();
    }
    public boolean processInput(String input)
    {
        String[] parts = input.split(":");
        if(parts.length != 2)
        {
            System.out.println("Invalid format");
            return false;
        }
        String name = parts[0];
        String scoreStr=parts[1];
        if(!name.matches("[a-zA-Z]+"))
        {
            System.out.println("Invlaid format");
            return false;
        }
        try
        {
            int score = Integer.parseInt(scoreStr);
            scoreMap.put(name, score);
            return true;
        }
        catch(NumberFormatException e)
        {
            System.out.println("Invalid input");
            return false;
        }
    }
}
```

```

    }
    public String findTopPlayer()
    {
        if(scoreMap.isEmpty())
        {
            return "";
        }
        String topPlayer = "";
        int maxScore = Integer.MIN_VALUE;
        for(Map.Entry<String, Integer> entry : scoreMap.entrySet())
        {
            if(entry.getValue() > maxScore)
            {
                maxScore = entry.getValue();
                topPlayer = entry.getKey();
            }
        }
        return topPlayer;
    }
}

```

```

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        ScoreTracker tracker = new ScoreTracker();
        boolean validInput = true;

        while (true) {
            String input = scanner.nextLine();

            if (input.toLowerCase().equals("done")) {
                break;
            }

            if (!tracker.processInput(input)) {
                validInput = false;
                break;
            }
        }

        if (validInput && !tracker.scoreMap.isEmpty()) {
            System.out.println(tracker.findTopPlayer());
        }
    }
}

```

```
}  
    scanner.close();  
}  
}
```

**Status :** Correct

**Marks :** 10/10

### 3. Problem Statement

A college professor wants to keep track of students who attend classes. Each student has a unique roll number and their attendance count increases every time they attend a class. The system should allow adding a student, marking their attendance, and displaying all students with their total attendance.

Your task is to implement a Java program using TreeSet to maintain students in sorted order of roll numbers and track their attendance count.

Operations:

A roll\_no name Add a student with roll number and name (if not already added). M roll\_no Mark attendance for the student with the given roll number (increase their count by 1). D Display all students in ascending order of roll number along with their attendance count.

#### **Input Format**

The first line contains an integer N - the number of students.

The next N lines contain one of the following commands:

A roll\_no name

M roll\_no

D

- A (Add) Adds a new student with a unique roll number and name.
- M (Mark) Increases attendance count for the given roll number.
- D (Display) Prints all students in ascending order of roll number.

### **Output Format**

For D, output prints each student's roll number, name, and attendance count in ascending order of roll number.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

A 101 Alice

A 102 Bob

M 101

M 101

D

Output: 101 Alice 2

102 Bob 0

### **Answer**

// You are using Java

```
import java.util.Scanner;
```

```
import java.util.TreeSet;
```

```
import java.util.Objects;
```

```
class Student implements Comparable<Student>
```

```
{  
    int roll_no;  
    String name;  
    int attendance;
```

```
    public Student(int roll_no, String name)  
    {
```

```
        this.roll_no=roll_no;  
        this.name=name;  
        this.attendance=0;
```

```
    }  
    public void markAttendance()  
    {  
        this.attendance++;  
    }
```

```

@Override
public String toString()
{
    return roll_no + " " + name + " " + attendance;
}
@Override
public int compareTo(Student other)
{
    return Integer.compare(this.roll_no, other.roll_no);
}
@Override
public boolean equals(Object obj)
{
    if(this == obj) return true;

    if(obj == null || getClass() != obj.getClass()) return false;

    Student student = (Student) obj;
    return this.roll_no == student.roll_no;
}
@Override
public int hashCode()
{
    return Objects.hash(roll_no);
}
}
public class Main
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        TreeSet<Student> studentSet = new TreeSet<>();
        int N=Integer.parseInt(sc.nextLine());
        for(int i=0;i<N;i++)
        {
            String line = sc.nextLine();
            String[] parts = line.split(" ");
            String command = parts[0];

            switch(command)
            {
                case "A":

```

```

int roll_no = Integer.parseInt(parts[1]);
String name=parts[2];

Student newStudent = new Student(roll_no, name);
studentSet.add(newStudent);
break;

```

```

case "M":
    int markRollNo = Integer.parseInt(parts[1]);
    for(Student s : studentSet)
    {
        if(s.roll_no == markRollNo)
        {
            s.markAttendance();
            break;
        }
    }
    break;

```

```

case "D":
    for(Student s: studentSet)
    {
        System.out.println(s);
    }
    break;

```

```

    }
}
}

```

**Status :** Correct

**Marks :** 10/10

#### 4. Problem Statement

Arjun is working on a program that checks if one set of numbers is a subset of another. If Set B is a subset of Set A, the program should print "YES" followed by the sorted elements of Set B. If Set B is not a subset of Set A, the program should print "NO" followed by the average of all elements from both sets combined, rounded to two decimal places.

Implement a class Solution with the required method to perform the subset check using TreeSet in Java.

### ***Input Format***

The first line contains an integer n - the number of elements in Set A.

The second line contains n space-separated integers - the elements of Set A.

The third line contains an integer m - the number of elements in Set B.

The fourth line contains m space-separated integers - the elements of Set B.

### ***Output Format***

If Set B is a subset of Set A, print "YES" followed by the sorted values of Set B.

Otherwise, print "NO" followed by the average of all numbers in both sets (rounded to two decimal places).

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: 5

1 2 3 4 5

3

2 3 5

Output: YES 2 3 5

### ***Answer***

```
import java.util.*;
```

```
// You are using Java
```

```
class Solution {
```

```
    //Type your code here
```

```
    public static void checkSubset(TreeSet<Integer> setA, TreeSet<Integer> setB,  
int totalCount, long totalSum)
```

```
    {
```

```
        if(setA.containsAll(setB))
```

```
        {
```

```

        System.out.print("YES");

        for(Integer val:setB)
        {
            System.out.print(" " + val);
        }
        System.out.println();
    }
    else
    {
        double average = (double) totalSum/totalCount;
        System.out.printf("NO %.2f%n",average);
    }
}
}

class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        TreeSet<Integer> setA = new TreeSet<>();
        long sum = 0;
        for (int i = 0; i < n; i++) {
            int num = sc.nextInt();
            setA.add(num);
            sum += num;
        }
        int m = sc.nextInt();
        TreeSet<Integer> setB = new TreeSet<>();
        for (int i = 0; i < m; i++) {
            int num = sc.nextInt();
            setB.add(num);
            sum += num;
        }
        Solution.checkSubset(setA, setB, n + m, sum);
        sc.close();
    }
}

```

**Status :** Correct

**Marks :** 10/10