

# Rajalakshmi Engineering College

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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 : 10

#### **Section 1 : Coding**

##### **1. 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**

```
import java.util.*;  
class NonRepeatingCharacterFinder {  
  
    public char findFirstNonRepeatingCharacter(String str) {  
        HashMap<Character, Integer> charCount = new HashMap<>();  
  
        for (char ch : str.toCharArray()) {  
            charCount.put(ch, charCount.getOrDefault(ch, 0) + 1);  
        }  
  
        for (char ch : str.toCharArray()) {  
            if (charCount.get(ch) == 1) {  
                return ch;  
            }  
        }  
        return '\0';  
    }  
}  
class FirstNonRepeatingCharacter {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        int N = sc.nextInt();
```

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

NonRepeatingCharacterFinder finder = new NonRepeatingCharacterFinder();
char result = finder.findFirstNonRepeatingCharacter(str);

if (result == '\0') {
    System.out.println(-1);
} else {
    System.out.println(result);
}

sc.close();
}
```

Status : Correct

Marks : 10/10

## 2. 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**

Status : -

Marks : 0/10

### **3. 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***

-

**Status :** -

**Marks :** 0/10