

# RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM 602 105



**RAJALAKSHMI  
ENGINEERING  
COLLEGE**

## CS23333 OOPS Using Java

Laboratory Record Note Book

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Semester : III

Academic Year : 2025



**RAJALAKSHMI ENGINEERING  
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An Autonomous Institution

**BONAFIDE CERTIFICATE**

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Academic Year: .....2025..... Semester: .....1<sup>st</sup>..... Branch: .....BE-CSE.....

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*Certified that this is the bonafide record of work done by the above student in  
the.....DOPS.....USING JAVA - CS23333.....Laboratory  
during the academic year 2025- 2026*

*M. Duf*  
Signature of Faculty in-charge

Submitted for the Practical Examination held on.....19/11/2025.....

Internal Examiner

External Examiner

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

### 2028\_REC\_OOPS using Java\_Week 1\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 11

#### Section 1 : MCQ

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

```
import java.util.*;

class TernaryOperatorExample {
    public static void main(String[] args) {
        int a = 5, b = 10;
        int result = (a > b) ? a : b;
        System.out.println(result);
    }
}
```

**Answer**

10

**Status : Correct**

**Marks : 1/1**

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

```
class DivisionExample {  
    public static void main(String[] args) {  
        double num1 = 10.5;  
        double num2 = 3;  
        int result = (int)(num1 / num2);  
        System.out.println(result);  
    }  
}
```

**Answer**

3

**Status :** Correct

**Marks :** 1/1

3. What is the output of the following code?

```
import java.util.*;  
  
class RelationalOperatorExample {  
    public static void main(String[] args) {  
        int x = 8, y = 4;  
        boolean result = (x != y);  
        System.out.println(result);  
    }  
}
```

**Answer**

true

**Status :** Correct

**Marks :** 1/1

4. What is the result of the following expression?

```
import java.util.*;  
  
class ComplexExpressionExample {
```

```
public static void main(String[] args) {  
    int a = 5, b = 2, c = 3, d = 4;  
    int result = a + b * c / d - b;  
  
    System.out.println(result);  
}  
}
```

**Answer**

5

**Status : Wrong**

**Marks : 0/1**

5. Which of the following data types is used to store single characters?

**Answer**

char

**Status : Correct**

**Marks : 1/1**

6. What will be the output of the following code snippet?

```
import java.util.*;  
  
class OperatorPrecedenceExample {  
    public static void main(String[] args) {  
        int a = 5, b = 3, c = 2;  
        int result = a + b * c;  
  
        System.out.println(result);  
    }  
}
```

**Answer**

13

**Status : Wrong**

**Marks : 0/1**

7. What is the output of the following program?

```
class Arithmetic {  
    public static void main(String[] args) {  
        char ch = 'A';  
        System.out.println(ch);  
    }  
}
```

**Answer**

A

**Status :** Correct

**Marks :** 1/1

8. Which of the following is not a primitive data type?

**Answer**

string

**Status :** Correct

**Marks :** 1/1

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

```
class DataTypesMCQ {  
    public static void main(String[] args) {  
        int a = 10;  
        double b = 5;  
        System.out.println(a / b);  
    }  
}
```

**Answer**

2.0

**Status :** Correct

**Marks :** 1/1

10. What is the output of the following program?

```
class Demo {  
    public static void main(String[] args) {  
        String text = "Hello, World!";  
        System.out.println(text);  
    }  
}
```

**Answer**

Hello, World!

**Status :** Correct

**Marks :** 1/1

11. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int a = 5;  
        int b = 10;  
  
        int sum = a + b;  
        int bitwiseAnd = a & b;  
        int bitwiseOr = a | b;  
  
        System.out.println(sum);  
        System.out.println(bitwiseAnd);  
        System.out.println(bitwiseOr);  
    }  
}
```

**Answer**

compilation error

**Status :** Wrong

**Marks :** 0/1

12. Which of the following data types is used to store floating-point numbers with greater precision?

**Answer**

double



Status : Correct

Marks : 1/1

13. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int count = 8;  
        count = count ^ 1;  
  
        System.out.println(count);  
    }  
}
```

Answer

9

Status : Correct

Marks : 1/1

14. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int x = 5;  
        int X = 10;  
  
        int sum = x + X;  
        int bitwiseResult = x | X;  
  
        System.out.println(sum);  
        System.out.println(bitwiseResult);  
    }  
}
```

Answer

10 15

Status : Wrong

Marks : 0/1

15. What is the output of the following code?

```
class TestClass {  
    public static void main(String[] args) {  
        int a = 10;  
        int b = 3;  
        System.out.println(a / b);  
    }  
}
```

**Answer**

3

**Status :** Correct

**Marks :** 1/1

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Gloria is responsible for monitoring the performance of two machines in a factory. She needs to determine which of the two machines is operating closest to the optimal temperature of 100 degrees Celsius using the relational operator.

Assist Gloria in displaying the machine's temperature, which is closer to 100, and the difference from 100.

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

The first line of input consists of an integer N, representing the temperature of the first machine.

The second line consists of an integer M, representing the temperature of the second machine.

### **Output Format**

The output prints "The integer closer to 100 is X with a difference of Y" where X is the temperature of the closer machine and Y is the difference from 100.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 90

80

Output: The integer closer to 100 is 90 with a difference of 10

### **Answer**

// You are using Java

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

```
class Main{
```

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

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

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

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

```
        int diffN= Math.abs(100-N);
```

```
        int diffM= Math.abs(100-M);
```

```
        if (diffN<diffM){
```

```
            System.out.println("The integer closer to 100 is "+N+ " with a difference of "+diffN);
```

```
        }
```

```
        else{
```

```
            System.out.println("The integer closer to 100 is "+M+ " with a difference of "+diffM);
```

```
        }
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. PROBLEM STATEMENT:

Dave got two students who want help with their doubt. Each hands out an integer and wants to find if one integer is positive while the other is not divisible by 3. Write a program to achieve this and conclude for them.

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

The first line of input represents the first integer.

The second line of input represents the second integer.

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

The output should display as "One of the integers is positive while the other is not divisible by 3." or "Neither of the integers meets the condition."

Refer to the sample output for the formatting specifications.

**Sample Test Case**

Input: 4  
3

Output: One of the integers is positive while the other is not divisible by 3.

**Answer**

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc= new Scanner(System.in);
        int a= sc.nextInt();
        int b = sc.nextInt();
        if((a>0 && b%3!=0)|| (b>0 && a%3!=0)){
            System.out.println("One of the integers is positive while the other is not
divisible by 3.");
        }
        else{
            System.out.println("Neither of the integers meets the condition.");
        }
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem statement

Manoj, a developer at MoneyMatters Inc., is working on improving the company's financial system. He needs to create a program that takes an integer input, converts it into a double, and displays both the original integer and the converted double value.

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

The input consists of a single integer representing a monetary amount.

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

The first line of the output displays the "Original Integer: ", followed by an integer representation of the input value.

The second line displays the "Converted Double: ", followed by a double value representing the input as a decimal value.

Refer to the sample output for the formatting specifications.

**Sample Test Case**

Input: 20

Output: Original Integer: 20

Converted Double: 20.0

**Answer**

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc= new Scanner(System.in);
        int m =sc.nextInt();
        double n = (double) m;
        System.out.println("Original Integer:"+m);
        System.out.println("Converted Double:"+n);
    }
}
```

**Status :** Correct

**Marks : 10/10**



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

### 2028\_REC\_OOPS using Java\_Week 1\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Vishal and Arun are discussing the properties of numbers. Vishal gives Arun two integers. He asks Arun to check if the sum of these two numbers is a multiple of their product.

Can you assist Arun and determine whether the sum is a multiple of the product?

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

The input consists of two space-separated integers.

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

The output prints:

1. "Sum is Multiple of Product" if the sum of the two numbers is divisible by their product.
2. "Sum is Not Multiple of Product" otherwise.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1 2

Output: Sum is Not Multiple of Product

### **Answer**

// You are using Java

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

```
class Main{
```

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

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

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

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

```
        int c= a+b;
```

```
        int d= a*b;
```

```
        if(c%d!=0){
```

```
            System.out.println("Sum is Not Multiple of Product");
```

```
        }
```

```
        else{
```

```
            System.out.println("Sum is Multiple of Product");
```

```
        }
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement:

Emily has a beautiful circular garden in her backyard. She's interested in calculating two important measurements for her garden: the circumference and the area. To do this, she needs a program that can take the radius of her circular garden as input and provide the calculated circumference and area as output. The formulas she should use are as follows:

To calculate the circumference (C) of a circle, you can use the formula:

$$C = 2 * \pi * r$$

$$A = \pi * r^2$$

Where:

C represents the circumference.

A represents the area.

$\pi$  (pi) is approximately 3.14159.

r is the radius of the circle.

Emily is not a programmer, and she needs your help to create a program that will make these calculations for her garden.

### ***Input Format***

The first line of input contains a single double-point number radius, representing the radius of the circle.

### ***Output Format***

The output should consist of two lines:

The first line should print the circumference of the circle rounded to 2 decimal places, followed by the unit "meters".

The second line should print the area of the circle rounded to 2 decimal places, followed by the unit "square meters".

Refer to the sample output for formatting specifications.

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

Input: 3.0

Output: Circumference: 18.85 meters

Area: 28.27 square meters

### ***Answer***

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc= new Scanner(System.in);
        double r = sc.nextDouble();
        double C = 2*3.14159*r;
```

```
double A= 3.14159*r*r;  
System.out.printf("circumference:%.2f\nmeters",C);  
System.out.printf("Area:%.2f square meters",A);  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q6

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Joey is learning about bitwise operations and is working on a project that involves extracting specific bits from integers. He needs to write a program that takes an integer and the number of bits N as input and outputs the value of the lowest N bits of the integer.

Help Joey in his project to understand and visualize how bitwise operations work in practical scenarios.

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

The first line of input consists of an integer X, representing the given integer.

The second line consists of an integer N, representing the number of bits to extract.

### **Output Format**

The output displays "Result:" followed by an integer representing the value of the lowest N bits of the given integer.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 85

2

Output: Result: 1

### **Answer**

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc= new Scanner(System.in);
        int X = sc.nextInt();
        int N = sc.nextInt();
        int m = (1<<N) - 1;
        int res= X & m;
        System.out.println("Result:" +res);
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q6

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Joey is learning about bitwise operations and is working on a project that involves extracting specific bits from integers. He needs to write a program that takes an integer and the number of bits N as input and outputs the value of the lowest N bits of the integer.

Help Joey in his project to understand and visualize how bitwise operations work in practical scenarios.

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

The first line of input consists of an integer X, representing the given integer.

The second line consists of an integer N, representing the number of bits to extract.



### **Output Format**

The output displays "Result: " followed by an integer representing the value of the lowest N bits of the given integer.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 85

2

Output: Result: 1

### **Answer**

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc= new Scanner(System.in);
        int X = sc.nextInt();
        int N = sc.nextInt();
        int m = (1<<N) - 1;
        int res= X & m;
        System.out.println("Result:" +res);
    }
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q7

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement:

Miles is working on a program that involves analyzing two integers. He wants to check if either one of the integers is both:

Less than or equal to zero, and Odd. Can you help him create a program that identifies whether either of the integers meets these conditions?

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

The input consists of two integers on separate lines, denoted as 'input1' and 'input2'.

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

A single line with a boolean result (either 'true' or 'false') indicating whether either 'input1' or 'input2' is both less than or equal to zero and odd.

Refer to the sample output for format specifications

**Sample Test Case**

Input: -45

10

Output: true

**Answer**

// You are using Java

import java.util.\*;

class Main{

public static void main(String args[]){

Scanner sc= new Scanner(System.in);

int input1= sc.nextInt();

int input2 = sc.nextInt();

boolean con1 = (input1<=0) && (input1 % 2 !=0);

boolean con2 = (input2<=0) && (input2 % 2 !=0);

System.out.println(con1||con2);

}

}

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q8

Attempt : 1  
Total Mark : 10  
Marks Obtained : 5

#### Section 1 : Coding

##### 1. Problem Statement

In the Kingdom of Finance, the royal treasury is managed by the treasurer, Sir Cedric. Sir Cedric tracks the daily expenses of the kingdom using an expense report that lists three major categories: food, clothing, and utilities. However, the King wants to know if the average daily expense is greater than at least two of these categories to ensure the kingdom is spending wisely.

Your task is to help Sir Cedric determine if the average daily expense is greater than two of the categories. Specifically, you need to calculate the average of the three expenses and check if it is greater than any two categories.

Note: Use the ternary operator

### ***Input Format***

Three integers a, b, and c represent the daily expenses for food, clothing, and utilities. Each integer is provided on a single line.

### ***Output Format***

The average of the three expenses, rounded to two decimal places.

A message indicating whether the average is greater than at least two of the expense categories.

1. If the average is greater than the two smallest monthly expenses, print "Average is greater than both X and Y," where X and Y are the two smallest expenses.
2. Otherwise, display "Average is not greater than two smallest expenses".

Refer to the sample output for formatting specifications.

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

Input: 4

6

10

Output: 6.67

Average is greater than both 4 and 6

### ***Answer***

```
// You are using Java
import java.util.*;
public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();
        double avg = (a + b + c) / 3.0;
        System.out.printf("%.2f\n", avg);
        int m1, m2;
        if (a <= b && a <= c) {
            m1 = a;
```

```
m2 = (b <= c) ? b : c;
} else if (b <= a && b <= c) {
    m1 = b;
    m2 = (a <= c) ? a : c;
} else {
    m1 = c;
    m2 = (a <= b) ? a : b;
}
String message = (avg > m1 && avg > m2)
    ? String.format("Average is greater than both %d and %d", m1, m2)
    : "Average is not greater than two smallest expenses";

System.out.println(message);
}
```

**Status :** Partially correct

**Marks :** 5/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q9

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Phill is a quality control manager at a manufacturing plant. He needs to verify if a sensor reading at a midpoint station (S2) falls exactly halfway between the readings of the previous station (S1) and the next station (S3). Help him by developing a program that checks if the second sensor reading is the average (midpoint) of the first and third sensor readings.

Use the relational operator to solve the program.

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

The first line of input consists of an integer S1, representing the sensor reading of the first station.

The second line consists of an integer S2, representing the sensor reading of the midpoint station.

The third line consists of an integer S3, representing the sensor reading of the next station.

### **Output Format**

The first line of output displays a boolean value representing whether the sensor reading at the midpoint station is halfway between the readings of the first and the next stations.

The second line displays one of the following:

1. If the result is true, print "The second integer is halfway between the first and third integers."
2. Otherwise, print "The second integer is not halfway between the first and third integers."

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1

7

10

Output: false

The second integer is not halfway between the first and third integers.

### **Answer**

```
// You are using Java
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int S1 = sc.nextInt();
        int S2 = sc.nextInt();
        int S3 = sc.nextInt();
        boolean m = S2 == (S1 + S3) / 2;
        System.out.println(m);
        if (m) {
            System.out.println("The second integer is halfway between the first and
third integers.");
        }
    }
}
```



```
    } else {  
        System.out.println("The second integer is not halfway between the first  
and third integers.");  
    }  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 1\_Q10

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Aishu is supervising a construction project that needs to be completed with the help of three workers: A, B, and C.

She knows how many days each of them would take to complete the entire project individually:

A can complete it in x days, B in y days, C in z days.

Initially, all three workers (A, B, and C) work together for d1 days.

After that, C leaves, and only A and B continue for another d2 days.

Then B also leaves, and A works alone to finish the remaining work.

Your task is to help aishu to implement this functionality using the class WorkDistribution and Method calculateWork(int x, int y, int z, int d1, int d2)

Calculate the total work completed in the first  $d_1$  days by A, B, and C. Calculate the work completed in the next  $d_2$  days by A and B. Determine the remaining work after these  $d_1 + d_2$  days.

### ***Input Format***

The first line of input contains five space-separated integers:  $x$   $y$   $z$   $d_1$   $d_2$

where:

$x$  represents the Days A takes to complete the work alone

$y$  represents the Days B takes to complete the work alone

$z$  represents the Days C takes to complete the work alone

$d_1$  represents the Days A, B, and C work together

$d_2$  represents the Days A and B work together (after C leaves)

### ***Output Format***

The first line of output prints "Work done in first  $d_1$  days (A+B+C): " followed by a double value rounded to 2 decimal places.

The second line of output prints "Work done in next  $d_2$  days (A+B): " followed by a double value rounded to 2 decimal places.

The third line prints "Remaining work: " followed by a double value rounded to 2 decimal places.

Refer to the sample output for formatting specifications.

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

Input: 10 20 30 2 2

Output: Work done in first  $d_1$  days (A+B+C): 0.37

Work done in next  $d_2$  days (A+B): 0.30

Remaining work: 0.33

### ***Answer***

```
// You are using Java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int x = sc.nextInt();
        int y = sc.nextInt();
        int z = sc.nextInt();
        int d1 = sc.nextInt();
        int d2 = sc.nextInt();
        double A = 1.0 / x;
        double B = 1.0 / y;
        double C = 1.0 / z;

        double workABC = d1 * (A + B + C);
        double workAB = d2 * (A + B);
        double remaining = 1 - (workABC + workAB);
        remaining = remaining < 0 ? 0 : remaining;

        System.out.printf("Work done in first d1 days (A+B+C): %.2f\n", workABC);
        System.out.printf("Work done in next d2 days (A+B): %.2f\n", workAB);
        System.out.printf("Remaining work: %.2f\n", remaining);
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 13

#### Section 1 : MCQ

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

```
class ConditionTest {  
    public static void main(String[] args) {  
        int x = 10;  
        if (x > 5)  
            System.out.print("High");  
    }  
}
```

**Answer**

High

**Status :** Correct

**Marks :** 1/1

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

```
class LoopTest {  
    public static void main(String[] args) {  
        int i = 1;  
        while (i > 0) {  
            System.out.print(i + " ");  
            i++;  
            if (i == 5) break;  
        }  
    }  
}
```

**Answer**

1 2 3 4

**Status :** Correct

**Marks :** 1/1

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

```
public class Main {  
    public static void main(String[] args) {  
        int sum = 0;  
        for(int i = 1; i <= 5; i++) {  
            sum += i;  
        }  
        System.out.println(sum);  
    }  
}
```

**Answer**

15

**Status :** Correct

**Marks :** 1/1

4. What will be the output of the following Java code snippet?

```
public class Main {  
    public static void main(String[] args) {
```

```
int day = 4;
String result = "";
switch(day) {
    case 1:
        result = "Monday";
        break;
    case 2:
        result = "Tuesday";
        break;
    case 3:
        result = "Wednesday";
        break;
    default:
        result = "Other Day";
}
System.out.println(result);
}
```

**Answer**

Other Day

**Status :** Correct

**Marks :** 1/1

5. What will be the output of the following Java code snippet?

```
public class Main {
    public static void main(String[] args) {
        int score = 75;
        if(score >= 90) {
            System.out.println("Grade: A");
        } else if(score >= 80) {
            System.out.println("Grade: B");
        } else if(score >= 70) {
            System.out.println("Grade: C");
        } else {
            System.out.println("Grade: D");
        }
    }
}
```

}

**Answer**

Grade: C

**Status :** Correct

**Marks :** 1/1

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

```
public class Main {  
    public static void main(String[] args) {  
        int i = 1;  
        while(i < 10) {  
            i += 2;  
        }  
        System.out.println(i);  
    }  
}
```

**Answer**

11

**Status :** Correct

**Marks :** 1/1

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

```
class Main {  
    public static void main(String[] args) {  
        for (int i = 5; i > 0; i--) {  
            System.out.print(i + " ");  
        }  
    }  
}
```

**Answer**

1 2 3 4 5

**Status :** Wrong

**Marks :** 0/1



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

```
class Test {  
    public static void main(String[] args) {  
        int x = 5, y = 2;  
        if (x + y == 10)  
            System.out.print("Ten");  
        else if (x - y == 3)  
            System.out.print("Three");  
        else  
            System.out.print("None");  
    }  
}
```

**Answer**

Three

**Status :** Correct

**Marks :** 1/1

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

```
class Test {  
    public static void main(String[] args) {  
        int num = 15;  
        if (num > 10)  
            if (num % 3 == 0)  
                System.out.print("Divisible");  
            else  
                System.out.print("Not Divisible");  
    }  
}
```

**Answer**

Divisible

**Status :** Correct

**Marks :** 1/1

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

```
class ConditionTest {  
    public static void main(String[] args) {  
        int a = 7;  
        if (a == 7)  
            System.out.print("Match");  
        else  
            System.out.print("No Match");  
    }  
}
```

**Answer**

Match

**Status :** Correct

**Marks :** 1/1

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

```
public class Main {  
    public static void main(String[] args) {  
        for(int i = 1; i <= 20; i = i * 2) {  
            System.out.print(i + " ");  
        }  
    }  
}
```

**Answer**

1 2 4 8 16

**Status :** Correct

**Marks :** 1/1

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

```
class Test {  
    public static void main(String[] args) {  
        int a = 4, b = 5;  
        if ((a + b) % 2 == 0)  
            System.out.print("Even");  
        else
```

```
        System.out.print("Odd");  
    }  
}
```

**Answer**

Odd

**Status :** Correct

**Marks :** 1/1

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

```
class LoopTest {  
    public static void main(String[] args) {  
        int i = 1;  
        do {  
            System.out.print(i + " ");  
            i *= 2;  
        } while (i <= 8);  
    }  
}
```

**Answer**

1 2 4 8

**Status :** Correct

**Marks :** 1/1

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

```
public class Main {  
    public static void main(String[] args) {  
        int i = 10;  
        do {  
            System.out.print(i + " ");  
            i -= 3;  
        } while(i > 0);  
    }  
}
```

**Answer**

4 3 2 1

Status : Wrong

Marks : 0/1

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

```
class Loop {  
    public static void main(String[] args) {  
        for (int i = 1; i <= 3; i++) {  
            for (int j = 1; j <= 2; j++) {  
                System.out.print(i + "" + j + " ");  
            }  
        }  
    }  
}
```

Answer

11 12 21 22 31 32

Status : Correct

Marks : 1/1

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Arun is working on a project to automate the process of determining whether a student has passed or failed based on their subject marks.

He aims to create a simple program that takes positive integers as marks for five subjects from the user. If the average of the marks is greater than or equal to 50, the student has passed the exam. Otherwise, the student has failed.

Help Arun to implement the project.

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

The input consists of five space-separated integers, representing the marks in five subjects.

### **Output Format**

The first line of output prints "Average score: " followed by an integer representing the average score.

The second line prints one of the following:

1. If the condition is satisfied, print "The student has passed".
2. Otherwise, the output prints "The student has failed".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 50 60 70 80 90

Output: Average score: 70

The student has passed

### **Answer**

// You are using Java

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

```
class Main{
```

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

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

```
        int m1= sc.nextInt();
```

```
        int m2= sc.nextInt();
```

```
        int m3= sc.nextInt();
```

```
        int m4= sc.nextInt ();
```

```
        int m5 =sc.nextInt();
```

```
        int total=m1+m2+m3+m4+m5;
```

```
        int avg = total/5;
```

```
        System.out.println("Average score:" +avg);
```

```
        if(avg>=50){
```

```
            System.out.println("The student has passed");
```

```
        }
```

```
        else{
```

```
            System.out.println("The student has failed");
```

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Status : Correct

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Marks : 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Samantha is a diligent math student who is exploring the world of programming. She is learning Java and has recently studied conditional statements. One day, her teacher gives her an interesting problem to solve, which takes a number as input and checks whether it is a multiple of 5 or 7.

Help her complete the task.

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

The input consists of a single integer N, representing the number to be checked.

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

If the number is a multiple of 5 but not 7, the output prints "N is a multiple of 5"



If the number is a multiple of 7, the output prints "N is a multiple of 7".

Otherwise the output prints "N is neither multiple of 5 nor 7" where N is an entered integer.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 10

Output: 10 is a multiple of 5

### **Answer**

// You are using Java

import java.util.\*;

class Main{

public static void main(String args[]){

Scanner sc = new Scanner(System.in);

int N = sc.nextInt();

if(N % 5==0 && N % 7 !=0){

System.out.println(+N+ " is a multiple of 5");

}

else if(N % 5 !=0 && N % 7 ==0){

System.out.println(+N+ " is a multiple of 7");

}

else{

System.out.println(+N+ " is neither multiple of 5 nor 7");

}

}

}

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

John is a fitness trainer, and he wants to use the BMI calculator to assess the body mass index of his clients. He has a list of clients based on their height and weight.

John plans to write a program to quickly determine the BMI and provide a classification for each client.

If BMI is less than 18.5, the program will classify it as "Underweight" If BMI is between 18.6 and 24.9, the program will classify it as "Normal Weight" If BMI is between 25.0 and 29.9, the program will classify it as "Overweight" If BMI is 30.0 or higher, the program will classify it as "Obese"

Note: Formula to calculate BMI =  $\text{weight}/(\text{height}*\text{height})$

***Input Format***

The first line of input consists of a double value, representing the height of the person in meters.

The second line consists of a double value, representing the weight of the person in kilograms.

### **Output Format**

The first line of output prints "BMI: " followed by a double (rounded to two decimal places) representing the calculated BMI.

The second line prints "Classification: " followed by a string indicating the BMI category (Underweight, Normal Weight, Overweight, or Obese).

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1.2

45.2

Output: BMI: 31.39

Classification: Obese

### **Answer**

```
// You are using Java
import java.util.*;
class Main{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        double h = sc.nextDouble();
        double w = sc.nextDouble();
        double Bmi= w/(h*h);
        System.out.printf("BMI: %.2f\n",Bmi);
        if (Bmi < 18.5){
            System.out.println("Classification:Under weight");
        }
        else if(Bmi>=18.6 && Bmi<=24.9){
            System.out.println("Classification: Normal weight");
        }
        else if(Bmi>=25.0 && Bmi<=29.9){
            System.out.println("Classification: Overweight");
        }
    }
}
```

```
}  
    else{  
        System.out.println("Classification: Obese");  
    }  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Amit wants to evaluate the depreciation of his car over time to understand its current value and categorize it based on that value.

Write a program that helps him determine the current value of his car after a certain number of years of depreciation and classify it into one of three categories:

High: If the current value is greater than 10,000. Medium: If the current value is between 5,000 and 10,000, both inclusive. Low: If the current value is less than 5,000.

The depreciation rate of the car is 15% per year. The program should calculate the current value of the car after applying this depreciation over the given number of years and print the current value along with the category.

### ***Input Format***

The first line of input consists of an integer, representing the initial cost of the car.

The second line consists of an integer, representing the number of years the car has been depreciating.

### ***Output Format***

The first line of output prints a double value, representing the current value of the car, rounded off to two decimal places "Current Value: <value>".

The second line prints its category "Category: <categories>".

Refer to the sample output for formatting specifications.

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

Input: 20000  
5

Output: Current Value: 8874.11  
Category: Medium

### ***Answer***

```
// You are using Java
import java.util.*;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        double initialCost = sc.nextDouble();
        int years = sc.nextInt();
        double rate = 0.15;
        double currentValue = initialCost;
        for (int i = 0; i < years; i++) {
            currentValue *= (1 - rate);
        }

        currentValue = Math.round(currentValue * 100.0) / 100.0;
        System.out.printf("Current Value: %.2f\n", currentValue);
    }
}
```

```
String category = (currentValue > 10000) ? "High" :  
                  (currentValue >= 5000) ? "Medium" : "Low";  
System.out.println("Category: " + category);  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Ted, the computer science enthusiast, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Guide Ted in designing and writing the code to solve this problem using a 'do-while' loop.

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

The input consists of an integer N, representing the number to be checked.

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

If the sum is equal to the number of digits, print "The number of digits in N matches the sum of its digits."



Else, print "The number of digits in N does not match the sum of its digits."

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 20

Output: The number of digits in 20 matches the sum of its digits.

### **Answer**

```
// You are using Java
import java.util.*;
public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        int num = N;
        int sum = 0;
        int count = 0;
        do {
            int digit = num % 10;
            sum += digit;
            count++;
            num /= 10;
        } while (num > 0);
        if (sum == count) {
            System.out.println("The number of digits in " + N + " matches the sum of
its digits.");
        } else {
            System.out.println("The number of digits in " + N + " does not match the
sum of its digits.");
        }
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q6

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Maya, a student in an arts and crafts class, wants to create a pattern using stars (\*) in a specific format. She plans to use a program to help her construct the pattern.

Write a program that takes an integer as input and constructs the following pattern using nested for loops.

Input: 5

Output:

\*  
\* \*

```
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
*
```

### ***Input Format***

The input consists of a number (integer) representing the number of rows.

### ***Output Format***

The output displays the required pattern.

Refer to the sample output for the formatting specifications.

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

Input: 5

Output: \*

```
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
*
```

### ***Answer***

```
// You are using Java
import java.util.*;
```

```
public class Main {
    public static void main(String[] args) {
```

```
Scanner sc = new Scanner(System.in);
int rows = sc.nextInt();
for (int i = 1; i <= rows; i++) {
    for (int j = 1; j <= i; j++) {
        System.out.print("* ");
    }
    System.out.println();
}
for (int i = rows - 1; i >= 1; i--) {
    for (int j = 1; j <= i; j++) {
        System.out.print("* ");
    }
    System.out.println();
}
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q7

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

You are taking part in a coding challenge where your task is to design a program that conjures a mesmerizing numerical pyramid pattern. The enchanting pattern is fashioned using a for loop and is customized based on user input.

Participants are prompted to unveil the pyramid's magic by specifying its height - essentially dictating the number of rows in this spellbinding creation.

Write a program that employs to weave this captivating numerical pyramid as shown below.

Example

Input:

4

Output:

### ***Input Format***

The input consists of a positive integer  $n$  representing the number of rows in the pattern.

### ***Output Format***

The output prints the required pyramid pattern, as shown in the sample output.

Refer to the sample output for the formatting specifications.

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

Input: 4

Output: 1

123

12345

1234567

### ***Answer***

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt(); // height of pyramid

        for (int i = 1; i <= n; i++) {
            // Print spaces for alignment
            for (int s = 1; s <= n - i; s++) {
                System.out.print(" ");
            }
            // Print numbers
            for (int j = 1; j <= (2 * i - 1); j++) {
```

```
        System.out.print(j);  
    }  
    System.out.println();  
}  
  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 2\_Q8

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

A bank generates secure codes using 3-digit numbers where each digit is unique, and the code must be divisible by 3. You are tasked with generating the first N such codes based on user input, ensuring the digits are unique and the number is divisible by 3.

Note: Use nested for loops to solve.

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

The first line contains an integer N representing the number of valid codes to generate.

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

The output prints N lines, each line contains a valid 3-digit code.



Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: 5

Output: 102

105

108

120

123

**Answer**

// You are using Java

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

```
public class Main {
```

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

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

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

```
        int count = 0;
```

```
        for (int i = 100; i <= 999 && count < N; i++) {
```

```
            int d1 = i / 100;
```

```
            int d2 = (i / 10) % 10;
```

```
            int d3 = i % 10;
```

```
            if (d1 != d2 && d2 != d3 && d1 != d3 && i % 3 == 0) {
```

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

```
                count++;
```

```
            }
```

```
        }
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

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

### REC\_2028\_OOPS using Java\_Week 3\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 8

#### Section 1 : MCQ

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

```
class Q {  
    public static void main(String[] args) {  
        int[][] a = {  
            {1, 2},  
            {3, 4}  
        };  
        for (int i = 0; i < a.length; i++) {  
            for (int j = 0; j < a[0].length; j++) {  
                System.out.print(a[i][j] + " ");  
            }  
        }  
    }  
}
```

**Answer**

1 2 3 4

**Status :** Correct

**Marks :** 1/1

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

```
class Q {  
    public static void main(String[] args) {  
        int[] nums = {3, 6, 7, 2, 8};  
        int sum = 0;  
        for (int i = 0; i < nums.length; i++) {  
            if (nums[i] % 2 == 0)  
                sum += nums[i];  
        }  
        System.out.println(sum);  
    }  
}
```

**Answer**

8

**Status :** Wrong

**Marks :** 0/1

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

```
public class Test {  
    public static void main(String[] args) {  
        int[] x = {4, 8, 12};  
        int result = x[0] * x[2];  
        System.out.println(result);  
    }  
}
```

**Answer**

48

**Status :** Correct

**Marks :** 1/1

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

```
class M {  
    public static void main(String[] args) {  
        int[][] arr = {  
            {1, 2},  
            {3, 4},  
            {5, 6}  
        };  
  
        for (int i = 0; i < arr.length; i++) {  
            System.out.print(arr[i][0] + " ");  
        }  
    }  
}
```

**Answer**

2 4 6

**Status : Wrong**

**Marks : 0/1**

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

```
class Q {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3, 4};  
        for (int i = 0; i < a.length; i++) {  
            if (a[i] % 2 == 0)  
                a[i] = 0;  
        }  
        System.out.println(a[1] + " " + a[3]);  
    }  
}
```

**Answer**

0 4

**Status : Wrong**

**Marks : 0/1**

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

```
class Q {  
    public static void main(String[] args) {  
        int[][] a = {  
            {1, 2},  
            {3, 4}  
        };  
        int sum = 0;  
        for (int i = 0; i < a.length; i++)  
            for (int j = 0; j < a[0].length; j++)  
                sum += a[i][j];  
        System.out.println(sum);  
    }  
}
```

**Answer**

44

**Status : Wrong**

**Marks : 0/1**

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

```
class Q {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3, 4};  
        for (int i = 0; i < a.length / 2; i++) {  
            int temp = a[i];  
            a[i] = a[a.length - 1 - i];  
            a[a.length - 1 - i] = temp;  
        }  
        System.out.println(a[0]);  
    }  
}
```

**Answer**

4

**Status : Correct**

**Marks : 1/1**

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

```
class Sample {  
    public static void main(String[] args) {  
        int[][] data = {  
            {1, 2},  
            {3, 4}  
        };  
        int sum = 0;  
  
        for (int[] row : data) {  
            for (int val : row) {  
                sum += val;  
            }  
        }  
  
        System.out.println("Sum = " + sum);  
    }  
}
```

**Answer**

Sum = 10

**Status : Correct**

**Marks : 1/1**

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

```
class Sample {  
    public static void main(String[] args) {  
        int[][] matrix = {  
            {1, 2, 3},  
            {4, 5, 6}  
        };  
        System.out.println(matrix[1][2]);  
    }  
}
```

**Answer**

6

Status : Correct

Marks : 1/1

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

```
class Q {  
    public static void main(String[] args) {  
        int[] nums = {4, 2, 9, 5};  
        int max = nums[0];  
        for (int i = 1; i < nums.length; i++) {  
            if (nums[i] > max)  
                max = nums[i];  
        }  
        System.out.println(max);  
    }  
}
```

Answer

5

Status : Wrong

Marks : 0/1

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

```
class Q {  
    public static void main(String[] args) {  
        int[][] arr = {  
            {5, 6, 7},  
            {8, 9, 10}  
        };  
        System.out.println(arr[0][2]);  
    }  
}
```

Answer

5

Status : Wrong

Marks : 0/1

12. What will be the output of the given code?

```
public class Main {  
    public static void main(String[] args) {  
        int[] arr = {1, 2, 3, 4, 5};  
        int n = arr.length;  
        int temp = arr[0];  
  
        for (int i = 0; i < n - 1; i++) {  
            arr[i] = arr[i + 1];  
        }  
        arr[n - 1] = temp;  
        for (int num : arr) {  
            System.out.print(num + " ");  
        }  
    }  
}
```

**Answer**

2 3 4 5 1

**Status :** Correct

**Marks :** 1/1

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

```
class ReverseArray {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3, 4};  
        for (int i = 0; i < a.length / 2; i++) {  
            int temp = a[i];  
            a[i] = a[a.length - 1 - i];  
            a[a.length - 1 - i] = temp;  
        }  
        for (int i : a)  
            System.out.print(i + " ");  
    }  
}
```



**Answer**

4 3 2 1

**Status :** Correct

**Marks :** 1/1

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

```
class Sample {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 3};  
        int product = 1;  
        for (int i = 0; i < a.length; i++) {  
            product *= a[i];  
        }  
        System.out.println(product);  
    }  
}
```

**Answer**

6

**Status :** Correct

**Marks :** 1/1

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

```
class Q {  
    public static void main(String[] args) {  
        int[] a = {1, 2, 1, 3, 1, 4};  
        int count = 0;  
        for (int i = 0; i < a.length; i++) {  
            if (a[i] == 1) count++;  
        }  
        System.out.println(count);  
    }  
}
```

**Answer**

4

Status : Wrong

Marks : 0/1

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

### 2028\_REC\_OOPS using Java\_Week 3\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Rosh is intrigued by numerical patterns. Today, she stumbled upon a puzzle while working with arrays. She wants to compute the sum of the third-largest and second-smallest elements from a list of integers. She seeks your help to implement a program that solves this for her efficiently.

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

The first line of input is an integer N, representing the size of the array.

The second line of input consists of N space-separated integers, representing the elements of the array.

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

The output displays a single integer representing the sum of the third-largest and second-smallest elements in the array.

Refer to the sample output for the formatting specifications.

**Sample Test Case**

Input: 10

10 20 30 40 50 60 70 80 90 100

Output: 100

**Answer**

```
// You are using Java
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        int[] arr = new int[N];
        for (int i = 0; i < N; i++) {
            arr[i] = sc.nextInt();
        }
        Arrays.sort(arr);
        int secondSmallest = arr[1];
        int thirdLargest = arr[N - 3];
        int result = secondSmallest + thirdLargest;
        System.out.println(result);
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 3\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Monica is interested in finding a treasure but the key to opening is to get the sum of the main diagonal elements and secondary diagonal elements.

Write a program to help Monica find the diagonal sum of a square 2D array.

Note: The main diagonal of the array consists of the elements traversing from the top-left corner to the bottom-right corner. The secondary diagonal includes elements from the top-right corner to the bottom-left corner.

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

The first line of input consists of an integer N, representing the number of rows and columns.

The following N lines consist of N space-separated integers, representing the 2D array elements.

### **Output Format**

The first line of output prints "Sum of the main diagonal: " followed by an integer, representing the sum of the main diagonal.

The second line prints "Sum of the secondary diagonal: " followed by an integer, representing the sum of the secondary diagonal.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3

1 2 3

4 5 6

7 8 9

Output: Sum of the main diagonal: 15

Sum of the secondary diagonal: 15

### **Answer**

// You are using Java

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

```
public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        int[][] matrix = new int[N][N];
        for (int i = 0; i < N; i++) {
            for (int j = 0; j < N; j++) {
                matrix[i][j] = sc.nextInt();
            }
        }
    }
}
```

```
int mainDiagonalSum = 0;
int secondaryDiagonalSum = 0;
for (int i = 0; i < N; i++) {
    mainDiagonalSum += matrix[i][i];
    secondaryDiagonalSum += matrix[i][N-1-i];
}
```

```
        secondaryDiagonalSum += matrix[i][N - 1 - i];
    }
    System.out.println("Sum of the main diagonal: " + mainDiagonalSum);
    System.out.println("Sum of the secondary diagonal: " +
        secondaryDiagonalSum);
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 3\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

You are developing a warehouse management system for a shipping company. The system uses an integer array to represent the weights of packages in a specific order. To verify that the weight capacity is not exceeded, the program needs to calculate the sum of the weights of the first and last packages in the list.

Task:

Write a code to calculate the sum of the weights of the first and last packages in the list. The program should take an integer array as input and return the total weight of the first and last packages.

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

The first line of the input is an integer N representing the size of the array.



The second line of the input is N space-separated integer values.

### **Output Format**

The output is displayed in the following format:

"Sum of the first and last elements: <<Sum>>"

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

10 20 30 40 50

Output: Sum of the first and last elements: 60

### **Answer**

// You are using Java

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

```
public class Main {
```

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

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

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

```
        int[] weights = new int[N];
```

```
        for (int i = 0; i < N; i++) {
```

```
            weights[i] = sc.nextInt();
```

```
        }
```

```
        int sum = weights[0] + weights[N - 1];
```

```
        System.out.println("Sum of the first and last elements: " + sum);
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 3\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Sesha is developing a weather monitoring system for a region with multiple weather stations. Each weather station collects temperature data hourly and stores it in a 2D array.

Write a program that can add the temperature data from two different weather stations to create a combined temperature record for the region.

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

The first line of input consists of two space-separated integers N and M, representing the number of rows and columns of the matrices, respectively.

The next N lines consist of M space-separated integers, representing the values of the first matrix.

The following N lines consist of M space-separated integers, representing the values of the second matrix.

### **Output Format**

The output prints the addition of the two matrices in N rows and M columns, representing the combined temperature record.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3 3

1 2 3

4 5 6

7 8 9

1 1 1

2 2 2

3 3 3

Output: 2 3 4

6 7 8

10 11 12

### **Answer**

// You are using Java

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

```
class Main{
```

```
    public static void add(int[][]m1,int[][]m2,int row,int col){
```

```
        for(int i=0;i<row;i++){
```

```
            for(int m=0;m<col;m++){
```

```
                System.out.print(m1[i][m]+m2[i][m]+" ");
```

```
            }
```

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

```
    }
```

```
}
```

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

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

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

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

```
        int[][]matrix=new int[r][c];
```

```
        for(int j =0;j<r;j++){
```

```
        for(int k =0;k<c;k++){  
            matrix[j][k] =sc.nextInt();  
        }  
    }  
    int [][]matrix2=new int[r][c];  
    for(int j =0;j<r;j++){  
        for(int k =0;k<c;k++){  
            matrix2[j][k] =sc.nextInt();  
        }  
    }  
    add(matrix,matrix2,r,c);  
    sc.close();  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 3\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Sharon is creating a program that finds the first repeated element in an integer array. The program should efficiently identify the first element that appears more than once in the given array. If no such element is found, it should appropriately display a message.

Help Sharon to complete the program.

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

The first line of input consists of an integer  $n$ , representing the number of elements in the array.

The second line consists of  $n$  space-separated integers, representing the array elements.

### **Output Format**

If a repeated element is found, print the first element that appears more than once.

If no repeated element is found, print "No repeated element found in the array".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 8

12 21 13 14 21 36 47 21

Output: 21

### **Answer**

// You are using Java

import java.util.\*;

class Main{

public static void main(String args[]){

Scanner sc=new Scanner(System.in);

int n=sc.nextInt();

int[]a=new int[n];

for(int i=0;i<n;i++){

a[i]=sc.nextInt();

}

int flag=0;

for(int j=0;j<n;j++){

for(int k=j+1;k<n;k++){

if(a[j]==a[k]){

flag=1;

System.out.println(a[j]);

break;

}

if(flag==1)

break;

}

if (flag==0){

System.out.println("No repeated element found in the array");

```
}  
    sc.close();  
}  
}
```

**Status :** Correct

**Marks : 10/10**

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

### REC\_2028\_OOPS using Java\_Week 3\_CY

Attempt : 1  
Total Mark : 40  
Marks Obtained : 40

#### Section 1 : Coding

##### 1. Problem Statement

Rina is managing the inventory for a library, where each row of a 2D matrix represents the number of different genres of books available on each shelf.

She wants to perform the following operations:

Transformation: Replace each element in a row with the sum of all elements in that row. Merging: After transformation, Rina will provide one additional matrix, and specify whether to merge the transformed matrix with this new matrix row-wise or column-wise.

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

The first line contains two integers R and C, representing the number of rows and columns of the initial matrix.



The next R lines contain C space-separated integers, representing the book counts in the library.

The next line contains two integers MR and MC, representing the dimensions of the second matrix (to be merged).

The next MR lines contain MC space-separated integers, representing the second matrix.

The last line contains an integer mergeType:

- 0 Row-wise merging (append the second matrix below the transformed matrix).
- 1 Column-wise merging (append the second matrix to the right of the transformed matrix).

### **Output Format**

The output prints "Transformed matrix: " followed by the transformed 2D matrix where each element in a row is replaced with the sum of the elements in that row.

The output prints "Final merged matrix: ", followed by the merging based on mergeType.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3 4

8 2 4 9

4 5 6 1

7 8 9 3

2 4

3 5 7 2

6 1 4 9

0

Output: Transformed matrix:

23 23 23 23

16 16 16 16

27 27 27 27  
Final merged matrix:  
23 23 23 23  
16 16 16 16  
27 27 27 27  
3 5 7 2  
6 1 4 9

### Answer

```
// You are using Java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int R = sc.nextInt();
        int C = sc.nextInt();
        int[][] matrix1 = new int[R][C];

        for (int i = 0; i < R; i++) {
            int sum = 0;
            for (int j = 0; j < C; j++) {
                matrix1[i][j] = sc.nextInt();
                sum += matrix1[i][j];
            }
            for (int j = 0; j < C; j++) {
                matrix1[i][j] = sum;
            }
        }
        int MR = sc.nextInt();
        int MC = sc.nextInt();
        int[][] matrix2 = new int[MR][MC];

        for (int i = 0; i < MR; i++) {
            for (int j = 0; j < MC; j++) {
                matrix2[i][j] = sc.nextInt();
            }
        }

        int mergeType = sc.nextInt();
        System.out.println("Transformed matrix:");
        for (int i = 0; i < R; i++) {
            for (int j = 0; j < C; j++) {
```

```

        System.out.print(matrix1[i][j] + " ");
    }
    System.out.println();
}
System.out.println("Final merged matrix:");
if (mergeType == 0) {
    for (int i = 0; i < R; i++) {
        for (int j = 0; j < C; j++) {
            System.out.print(matrix1[i][j] + " ");
        }
        System.out.println();
    }
    for (int i = 0; i < MR; i++) {
        for (int j = 0; j < MC; j++) {
            System.out.print(matrix2[i][j] + " ");
        }
        System.out.println();
    }
} else {
    for (int i = 0; i < R; i++) {
        for (int j = 0; j < C; j++) {
            System.out.print(matrix1[i][j] + " ");
        }
        for (int j = 0; j < MC; j++) {
            System.out.print(matrix2[i][j] + " ");
        }
        System.out.println();
    }
}
}
}
}
}

```

**Status :** Correct

**Marks :** 10/10

## 2. Problem Statement

Alex is a treasure hunter who collects valuable items during their quests. Each item has a specific point value, and Alex wants to maximize their score by strategically removing items one at a time.

The rule is simple: Alex removes the item with the highest point value in each step until no items are left, summing the values of the removed items to calculate the maximum score.

Help Alex to complete his task.

### ***Input Format***

The first line of input consists of an integer N, representing the size of the array.

The second line of input consists of N space-separated integers, representing the point values of the items.

### ***Output Format***

The output prints "Maximum Sum: " followed by the calculated maximum score after removing all items.

Refer to the sample output for formatting specifications.

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

Input: 14

7 14 21 28 35 42 49 56 63 70 77 84 91 98

Output: Maximum Sum: 735

### ***Answer***

```
// You are using Java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        int[] items = new int[N];
        int sum = 0;
        for (int i = 0; i < N; i++) {
            items[i] = sc.nextInt();
            sum += items[i];
        }
        System.out.println("Maximum Sum: " + sum);
    }
}
```

}

**Status :** Correct

**Marks :** 10/10

### 3. Problem Statement

Nikila is working as an intern in a software firm and is practicing with a matrix where each row represents a set of numerical values. Her task is to identify the row with the highest sum of its elements and remove that row from the matrix. After removing the row with the highest sum, Nikila needs to print the updated matrix.

Your task is to help Nikila in implementing the same. If there are two or more rows that have same the highest sum, the firstly encountered row is deleted.

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

The first line of the input consists of two space-separated integers, R and C, representing the number of rows and columns in the matrix, respectively.

The following R lines each contain, C space-separated integers representing the matrix elements.

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

The output prints the matrix after removing the row with the highest sum. Each row should be printed on a new line, with elements separated by a space.

Refer to the sample output for the formatting specifications.

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

Input: 2 2

1 2

3 4

Output: 1 2

#### ***Answer***

```

import java.util.*;;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int R = sc.nextInt();
        int C = sc.nextInt();
        int[][] matrix = new int[R][C];
        for (int i = 0; i < R; i++) {
            for (int j = 0; j < C; j++) {
                matrix[i][j] = sc.nextInt();
            }
        }
        int maxSum = 0;
        int maxRowIndex = 0;
        for (int i = 0; i < R; i++) {
            int rowSum = 0;
            for (int j = 0; j < C; j++) {
                rowSum += matrix[i][j];
            }
            if (i == 0 || rowSum > maxSum) {
                maxSum = rowSum;
                maxRowIndex = i;
            }
        }
        for (int i = 0; i < R; i++) {
            if (i == maxRowIndex) continue;
            for (int j = 0; j < C; j++) {
                System.out.print(matrix[i][j] + " ");
            }
            System.out.println();
        }
    }
}

```

**Status :** Correct

**Marks :** 10/10

#### 4. Problem Statement

Emma is a data analyst working with a grid-based system where each cell

contains important numerical data. The grid represents spatial data, inventory records, or structured reports that require periodic updates.

Due to system updates and new requirements, Emma needs to modify the grid in the following ways:

She wants to insert either a new row or a new column at a given position. Later, she needs to delete either a row or a column from the modified matrix.

### ***Input Format***

The first line contains two integers rows and cols (the dimensions of the matrix).

The next rows lines contain cols space-separated integers representing the initial matrix.

The next line contains two integers insertType and insertIndex:

- insertType = 0 for row insertion, 1 for column insertion.
- insertIndex is the position where the new row/column should be added.

If inserting a row, the next cols integers represent the new row or If inserting a column, the next rows integers represent the new column.

The next line contains two integers deleteType and deleteIndex:

- deleteType = 0 for row deletion, 1 for column deletion.
- deleteIndex is the position to be deleted.

### ***Output Format***

The first line of output prints the string "After insertion" followed by the modified matrix with the inserted row or column.

Each row of the matrix is printed on a new line with space-separated integers.

The next line prints the string "After deletion" followed by the final matrix after the specified deletion operation.

Each row of the resulting matrix is printed on a new line with space-separated integers.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3 3

1 2 3

4 5 6

7 8 9

0 1

10 11 12

1 2

Output: After insertion

1 2 3

10 11 12

4 5 6

7 8 9

After deletion

1 2

10 11

4 5

7 8

### **Answer**

// You are using Java

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

```
public class Main {
```

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

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

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

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

```
        int[][] matrix = new int[rows][cols];
```

```
        for (int i = 0; i < rows; i++) {
```

```
            for (int j = 0; j < cols; j++) {
```

```
                matrix[i][j] = sc.nextInt();
```

```
            }
```

```
        }
```

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

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

```
        if (insertType == 0) {
```



```

int[] newRow = new int[cols];
for (int i = 0; i < cols; i++) {
    newRow[i] = sc.nextInt();
}

int[][] temp = new int[rows + 1][cols];
for (int i = 0; i < insertIndex; i++) {
    temp[i] = matrix[i];
}
temp[insertIndex] = newRow;
for (int i = insertIndex; i < rows; i++) {
    temp[i + 1] = matrix[i];
}
matrix = temp;
rows++;
} else {

    int[] newCol = new int[rows];
    for (int i = 0; i < rows; i++) {
        newCol[i] = sc.nextInt();
    }

    int[][] temp = new int[rows][cols + 1];
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < insertIndex; j++) {
            temp[i][j] = matrix[i][j];
        }
        temp[i][insertIndex] = newCol[i];
        for (int j = insertIndex; j < cols; j++) {
            temp[i][j + 1] = matrix[i][j];
        }
    }
    matrix = temp;
    cols++;
}
System.out.println("After insertion");
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        System.out.print(matrix[i][j] + " ");
    }
    System.out.println();
}

```

```

// Read deletion details
int deleteType = sc.nextInt();
int deleteIndex = sc.nextInt();

if (deleteType == 0) {

    int[][] temp = new int[rows - 1][cols];
    int idx = 0;
    for (int i = 0; i < rows; i++) {
        if (i == deleteIndex) continue;
        temp[idx++] = matrix[i];
    }
    matrix = temp;
    rows--;
} else {
    int[][] temp = new int[rows][cols - 1];
    for (int i = 0; i < rows; i++) {
        int idx = 0;
        for (int j = 0; j < cols; j++) {
            if (j == deleteIndex) continue;
            temp[i][idx++] = matrix[i][j];
        }
    }
    matrix = temp;
    cols--;
}
System.out.println("After deletion");
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        System.out.print(matrix[i][j] + " ");
    }
    System.out.println();
}
}
}

```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 4\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

In a publishing company, editors often need to quickly analyze passages of text to check for punctuation usage. To assist them, you are asked to write a program that counts the number of specific punctuation marks in each passage.

The punctuation marks of interest are:

Commas (,) Periods (.) Question marks (?)

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

The first line of input contains an integer T, representing the number of test cases (passages).

Each of the next T lines contains a single passage of text.

### **Output Format**

For each test case, print three integers separated by spaces, representing the number of commas, periods, and question marks in the passage.

The first line of output corresponds to the first passage, the second line to the second passage, and so on.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1

Hello, world. How are you?

Output: 1 1 1

### **Answer**

// You are using Java

import java.util.\*;

public class Main {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        int T = Integer.parseInt(sc.nextLine());

        for (int i = 0; i < T; i++) {

            String line = sc.nextLine();

            int commas = 0, periods = 0, questions = 0;

            for (int j = 0; j < line.length(); j++) {

                char ch = line.charAt(j);

                if (ch == ',') commas++;

                else if (ch == '.') periods++;

                else if (ch == '?') questions++;

            }

            System.out.println(commas + " " + periods + " " + questions);

        }

    }

}

Status : Correct

Marks : 10/10

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

### 2028\_REC\_OOPS using Java\_Week 4\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Anu is developing a tool for a conference registration system. Participants submit keywords related to their fields of interest. The organizer wants to sort these keywords alphabetically to generate tags for session grouping.

Write a program that accepts at least five keywords as input arguments and outputs them in sorted alphabetical order.

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

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

The second line of input contains n space-separated keywords (string).

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

The output prints n space separated strings representing the sorted keyword in alphabetical order.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

Blockchain Cloud AI Data Cybersecurity

Output: AI Blockchain Cloud Cybersecurity Data

### **Answer**

```
// You are using Java
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());
        String[] keywords = sc.nextLine().split(" ");
        Arrays.sort(keywords);
        for (int i = 0; i < n; i++) {
            System.out.print(keywords[i]);
            if (i < n - 1) System.out.print(" ");
        }
    }
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 4\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Bechan Chacha is seeking help to filter out valid mobile numbers from a list provided by his crush. He can only pick his crush's number if the list contains valid mobile numbers.

A mobile number is considered valid if:

It has exactly 10 digits. It consists only of numeric values (0–9). It does not begin with zero.

Your task is to determine whether each mobile number in the list is valid or not.

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

The first line contains an integer T, representing the number of mobile numbers



to check.

The next T lines each contain a string S, representing a mobile number.

### **Output Format**

For each mobile number S, the output print "YES" if it is valid.

Otherwise, print "NO".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1  
9876543210

Output: YES

### **Answer**

```
// You are using Java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int T = Integer.parseInt(sc.nextLine());

        for (int i = 0; i < T; i++) {
            String number = sc.nextLine();

            if (number.length() == 10 && number.matches("[0-9]+") &&
number.charAt(0) != '0') {
                System.out.println("YES");
            } else {
                System.out.println("NO");
            }
        }
    }
}
```

**Status : Correct**

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 4\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Arjun is learning how to filter words from a sentence based on grammar rules. He wants to identify the valid words in a sentence.

A word is considered valid if it satisfies all these conditions:

The word contains only alphabets (a-z, A-Z). The word length is at least 2 characters. The word should not contain digits or special characters.

Your task is to read a sentence and print all the valid words in it.

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

The input contains a single line containing a sentence S.

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

The output prints all the valid words separated by spaces.

If no valid word exists, print "No valid words."

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: Hello world1 123 ab" @#\$ Hi

Output: Hello Hi

### **Answer**

```
// You are using Java
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String sentence = scanner.nextLine();
        scanner.close();

        String[] words = sentence.split(" ");
        List<String> validWords = new ArrayList<>();

        for (String word : words) {
            if (word.length() >= 2 && word.matches("[a-zA-Z]+")) {
                validWords.add(word);
            }
        }

        if (validWords.isEmpty()) {
            System.out.println("No valid words.");
        } else {
            System.out.println(String.join(" ", validWords));
        }
    }
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 4\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

In a secure banking system, customers are required to create PIN codes for accessing their accounts. The bank wants to validate these PIN codes before accepting them.

A PIN code is considered valid if:

It consists of exactly 4 digits. All characters must be numeric (0–9). It cannot contain all identical digits (e.g., 1111 is invalid).

Your task is to determine whether each PIN code in the list is valid or not.

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

The first line of input contains an integer T, representing the number of PIN codes to check.

The next T lines each contain a string S, representing a PIN code.

### **Output Format**

For each PIN code S, the output print "YES" if it is valid.

Otherwise, the output print "NO".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1

1234

Output: YES

### **Answer**

// You are using Java

import java.util.\*;

```
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int T = Integer.parseInt(scanner.nextLine());

        for (int i = 0; i < T; i++) {
            String pin = scanner.nextLine();

            if (isValidPin(pin)) {
                System.out.println("YES");
            } else {
                System.out.println("NO");
            }
        }

        scanner.close();
    }

    public static boolean isValidPin(String pin) {
        if (pin.length() != 4) {
```

```
        return false;
    }
    if (!pin.matches("\\d{4}")) {
        return false;
    }
    char first = pin.charAt(0);
    for (int i = 1; i < 4; i++) {
        if (pin.charAt(i) != first) {
            return true;
        }
    }
    return false;
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 5\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 15

#### Section 1 : MCQ

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

```
class Demo {  
    void printMessage() {  
        System.out.println("Hello from Demo");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Demo d = new Demo();  
        d.printMessage();  
    }  
}
```

**Answer**

Hello from Demo

**Status :** Correct

**Marks :** 1/1

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

```
class Alpha {  
    void greet(String name) {  
        System.out.println("Hello " + name);  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Alpha obj = new Alpha();  
        obj.greet("Anu");  
    }  
}
```

**Answer**

Hello Anu

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    int x = 50;  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        A obj1 = new A();  
        A obj2 = obj1;  
        obj2.x = 100;  
        System.out.println(obj1.x);  
    }  
}
```



**Answer**

100

**Status :** Correct

**Marks :** 1/1

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

```
class Box {  
    int length = 5;  
    int width = 4;  
  
    int area() {  
        return length * width;  
    }  
  
    public static void main(String[] args) {  
        Box b = new Box();  
        System.out.println("Area = " + b.area());  
    }  
}
```

**Answer**

Area = 20

**Status :** Correct

**Marks :** 1/1

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

```
class Test {  
    private int value;  
    Test(int value) {  
        this.value = value;  
    }  
    public int getValue() {  
        return value;  
    }  
}  
public class Main {
```

```
public static void main(String[] args) {  
    Test obj = new Test(10);  
    System.out.println(obj.value);  
}  
}
```

**Answer**

Compile-time error

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    int p = 5;  
    int q = 2;  
}  
  
class Main {  
    public static void main(String[] args) {  
        A obj = new A();  
        System.out.println(obj.p + obj.q);  
    }  
}
```

**Answer**

7

**Status :** Correct

**Marks :** 1/1

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

```
class Ball {  
    int size = 11;  
}  
  
class Game {  
    public static void main(String[] args) {  
        Ball b1 = new Ball();  
    }  
}
```

```
        Ball b2 = new Ball();  
        b2.size = 10;  
        System.out.println(b1.size);  
    }  
}
```

**Answer**

11

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    int val = 20;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        A obj1 = new A();  
        A obj2 = obj1;  
        obj2.val += 5;  
        System.out.println(obj1.val);  
    }  
}
```

**Answer**

25

**Status :** Correct

**Marks :** 1/1

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

```
class Sample {  
    int x = 10;  
  
    void display() {  
        System.out.println("x = " + x);  
    }  
}
```

```
public static void main(String[] args) {  
    Sample s = new Sample();  
    s.display();  
}  
}
```

**Answer**

x = 10

**Status :** Correct

**Marks :** 1/1

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

```
class MathUtils {  
    int add(int x) {  
        return x + x;  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        MathUtils m = new MathUtils();  
        System.out.println(m.add(5));  
    }  
}
```

**Answer**

10

**Status :** Correct

**Marks :** 1/1

11. What is the output of the following code?

```
class Box {  
    int height;  
    Box(int height) {  
        this.height = height;  
    }  
}
```

```
void modifyHeight(Box b) {  
    b.height += 10;  
}  
}  
public class Main {  
    public static void main(String[] args) {  
        Box b1 = new Box(20);  
        b1.modifyHeight(b1);  
        System.out.println(b1.height);  
    }  
}
```

**Answer**

30

**Status :** Correct

**Marks :** 1/1

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

```
class Person {  
    String name;  
    void setName(String n) {  
        name = n;  
    }  
    void printName() {  
        System.out.println(name);  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        Person p = new Person();  
        p.printName();  
    }  
}
```

**Answer**

null

**Status :** Correct

**Marks :** 1/1

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

```
class Box {  
    int volume(int l, int b, int h) {  
        return l * b * h;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Box b = new Box();  
        System.out.println(b.volume(2, 3, 4));  
    }  
}
```

**Answer**

24

**Status :** Correct

**Marks :** 1/1

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

```
class Person {  
    int age = 18;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        Person p = new Person();  
        p.age += 2;  
        System.out.println("Age: " + p.age);  
    }  
}
```

**Answer**

Age: 20

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    int y = 30;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        A a1 = new A();  
        A a2 = new A();  
        a1.y = 50;  
        System.out.println(a2.y);  
    }  
}
```

**Answer**

30

**Status :** Correct

**Marks :** 1/1

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

### 2028\_REC\_OOPS using Java\_Week 5\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

You are working as a developer for CityBank, which wants to build a basic account management system.

Each customer at the bank has:

An Account Number (integer) A Customer Name (string) An Initial Balance (double)

The bank allows two types of transactions:

Deposit – increases the balance. Withdrawal – decreases the balance only if enough funds are available.

If the withdrawal amount is greater than the balance, the withdrawal should not happen, and the balance should remain the same.



You are required to implement this system using:

A class with attributes for account details. A constructor to initialize account details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customers.

Finally, display each customer's account details after all transactions.

### ***Input Format***

The first line of input contains an integer N, representing the number of customers.

For each customer:

- The next line contains the account number (integer).
- The following line contains the customer name (string).
- The next line contains the initial balance (double).
- The next line contains the deposit amount (double).
- The next line contains the withdrawal amount (double).

### ***Output Format***

For each customer, print the details in the following format:

1. Account Number: <account\_number>
2. Customer Name: <customer\_name>
3. Final Balance: <final\_balance> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

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

Input: 1

1234

Rahul Sharma

5000

2000

3000

Output: Account Number: 1234

Customer Name: Rahul Sharma

Final Balance: 4000.0

**Answer**

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

```
class BankAccount {
    int accountNumber;
    String customerName;
    double balance;

    BankAccount(int accNum, String name, double initialBalance) {
        accountNumber = accNum;
        customerName = name;
        balance = initialBalance;
    }

    void deposit(double amount) {
        balance += amount;
    }

    void withdraw(double amount) {
        if (amount <= balance) {
            balance -= amount;
        }
    }

    void showDetails() {
        System.out.println("Account Number: " + accountNumber);
        System.out.println("Customer Name: " + customerName);
        System.out.printf("Final Balance: %.1f\n", balance);
    }
}
```

```
public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        sc.nextLine();

        for (int i = 0; i < N; i++) {
            int accNum = Integer.parseInt(sc.nextLine());
```

```
String name = sc.nextLine();
double initBalance = Double.parseDouble(sc.nextLine());
double depositAmt = Double.parseDouble(sc.nextLine());
double withdrawAmt = Double.parseDouble(sc.nextLine());

BankAccount customer = new BankAccount(accNum, name, initBalance);
customer.deposit(depositAmt);
customer.withdraw(withdrawAmt);
customer.showDetails();
}

sc.close();
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 5\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Neha is working as a developer for CityElectricity Board, which wants to build a household electricity billing system.

Each customer's electricity account has:

A Customer ID (integer) A Customer Name (string) Units Consumed (double)

The electricity bill is calculated based on these rules:

For the first 100 units 5 units charge per unit For the next 100 units (101–200) 7 units charge per unit For units above 200 10 units charge per unit If the total bill exceeds 2000 units, a 5% discount is applied on the final bill.

Neha has been asked to implement this system using:

A class with attributes for customer details. A constructor to initialize customer details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customers.

Finally, display each customer's details and final bill amount.

### ***Input Format***

The first line of input contains an integer N, representing the number of customers.

For each customer:

- The next line contains the Customer ID (integer).
- The following line contains the Customer Name (string).
- The next line contains the Units Consumed (double).

### ***Output Format***

For each customer, print the details in the following format:

Customer ID: <customer\_id>

Customer Name: <customer\_name>

Final Bill: <final\_bill> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

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

Input: 1

1001

Ravi Kumar

80

Output: Customer ID: 1001

Customer Name: Ravi Kumar

Final Bill: 400.0

### ***Answer***

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

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

```
class ElectricityCustomer {  
    private int customerId;  
    private String customerName;  
    private double unitsConsumed;
```

```
    // Constructor
```

```
    public ElectricityCustomer(int customerId, String customerName, double  
unitsConsumed) {  
        this.customerId = customerId;  
        this.customerName = customerName;  
        this.unitsConsumed = unitsConsumed;  
    }
```

```
    // Getter methods
```

```
    public int getCustomerId() {  
        return customerId;  
    }
```

```
    public String getCustomerName() {  
        return customerName;  
    }
```

```
    public double getUnitsConsumed() {  
        return unitsConsumed;  
    }
```

```
    // Method to calculate bill
```

```
    public double calculateBill() {  
        double bill = 0;
```

```
        if (unitsConsumed <= 100) {  
            bill = unitsConsumed * 5;  
        } else if (unitsConsumed <= 200) {  
            bill = 100 * 5 + (unitsConsumed - 100) * 7;  
        } else {  
            bill = 100 * 5 + 100 * 7 + (unitsConsumed - 200) * 10;  
        }
```

```
        if (bill > 2000) {  
            bill = bill - (bill * 0.05); // 5% discount
```

```

    }
    return bill;
}

// Method to display customer details
public void displayDetails() {
    System.out.println("Customer ID: " + customerId);
    System.out.println("Customer Name: " + customerName);
    System.out.printf("Final Bill: %.1f\n", calculateBill());
}
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = Integer.parseInt(sc.nextLine());

        ElectricityCustomer[] customers = new ElectricityCustomer[N];

        for (int i = 0; i < N; i++) {
            int id = Integer.parseInt(sc.nextLine());
            String name = sc.nextLine();
            double units = Double.parseDouble(sc.nextLine());

            customers[i] = new ElectricityCustomer(id, name, units);
        }

        for (ElectricityCustomer customer : customers) {
            customer.displayDetails();
        }

        sc.close();
    }
}

```

**Status :** Correct

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 5\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

You are working as a developer for CityCab, a taxi service company that wants to build a ride fare management system.

Each customer booking has:

A Booking ID (integer) A Customer Name (string) A Distance Travelled in km (double)

The fare calculation rules are:

Base Fare = 50 units (flat charge for every ride). Per km charge = 10 units/km. If the distance is greater than 20 km, a 10% discount is applied on the total fare.

You are required to implement this system using:



A class with attributes for booking details. A constructor to initialize booking details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent customer rides.

Finally, display each booking's details and final fare.

### ***Input Format***

The first line of input contains an integer N, representing the number of bookings.

For each booking:

- The next line contains the booking ID (integer).
- The following line contains the customer's name (string).
- The next line contains the distance travelled (double).

### ***Output Format***

For each booking, print the details in the following format:

1. Booking ID: <booking\_id>
2. Customer Name: <customer\_name>
3. Final Fare: <final\_fare> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

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

Input: 1  
1234  
Rahul Sharma  
15

Output: Booking ID: 1234  
Customer Name: Rahul Sharma  
Final Fare: 200.0

### ***Answer***

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

```
class RideBooking {
    private int bookingId;
    private String customerName;
    private double distance;

    // Constructor
    public RideBooking(int bookingId, String customerName, double distance) {
        this.bookingId = bookingId;
        this.customerName = customerName;
        this.distance = distance;
    }

    // Setter methods (if needed)
    public void setBookingId(int bookingId) {
        this.bookingId = bookingId;
    }

    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }

    public void setDistance(double distance) {
        this.distance = distance;
    }

    // Getter methods
    public int getBookingId() {
        return bookingId;
    }

    public String getCustomerName() {
        return customerName;
    }

    public double getDistance() {
        return distance;
    }

    // Method to calculate fare
    public double calculateFare() {
        double baseFare = 50;
        double perKmCharge = 10;
```

```

double totalFare = baseFare + (distance * perKmCharge);

if (distance > 20) {
    totalFare = totalFare - (totalFare * 0.10); // 10% discount
}

return totalFare;
}

// Method to display booking details
public void displayDetails() {
    System.out.println("Booking ID: " + bookingId);
    System.out.println("Customer Name: " + customerName);
    System.out.printf("Final Fare: %.1f\n", calculateFare());
}
}

public class Main{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = Integer.parseInt(sc.nextLine());

        RideBooking[] bookings = new RideBooking[N];

        for (int i = 0; i < N; i++) {
            int id = Integer.parseInt(sc.nextLine());
            String name = sc.nextLine();
            double distance = Double.parseDouble(sc.nextLine());

            bookings[i] = new RideBooking(id, name, distance);
        }

        for (RideBooking booking : bookings) {
            booking.displayDetails();
        }

        sc.close();
    }
}

```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 5\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Ram is working as a developer for BrightEdu Coaching Center, which wants to build a student fee management system.

Each student's enrollment has:

An Enrollment ID (integer) A Student Name (string) The Number of Subjects (integer)

The fee calculation rules are:

Registration Fee = 1000 units (flat for every student). Per Subject Fee = 800 units. If the student enrolls in more than 5 subjects, a 20% scholarship (discount) is applied on the total fee.

Ram has been asked to implement this system using:

A class with attributes for student details. A constructor to initialize student details. Setter methods to update details if needed. Getter methods to retrieve details. Objects of the class to represent student enrollments.

Finally, display each student's details and final fee.

### ***Input Format***

The first line of input contains an integer N, representing the number of students.

For each student:

- The next line contains the Enrollment ID (integer).
- The following line contains the student's name (string).
- The next line contains the Number of subjects (integer).

### ***Output Format***

For each student, print the details in the following format:

- Enrollment ID: <enrollment\_id>
- Student Name: <student\_name>
- Final Fee: <final\_fee> (rounded to one decimal place)

Refer to the sample output for formatting specifications.

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

Input: 1

1234

Ravi Kumar

3

Output: Enrollment ID: 1234

Student Name: Ravi Kumar

Final Fee: 3400.0

### ***Answer***

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

```
class StudentEnrollment {
```

```
private int enrollmentId;
private String studentName;
private int numberOfSubjects;

// Constructor
public StudentEnrollment(int enrollmentId, String studentName, int
numberOfSubjects) {
    this.enrollmentId = enrollmentId;
    this.studentName = studentName;
    this.numberOfSubjects = numberOfSubjects;
}

// Setter methods
public void setEnrollmentId(int enrollmentId) {
    this.enrollmentId = enrollmentId;
}

public void setStudentName(String studentName) {
    this.studentName = studentName;
}

public void setNumberOfSubjects(int numberOfSubjects) {
    this.numberOfSubjects = numberOfSubjects;
}

// Getter methods
public int getEnrollmentId() {
    return enrollmentId;
}

public String getStudentName() {
    return studentName;
}

public int getNumberOfSubjects() {
    return numberOfSubjects;
}

// Method to calculate final fee
public double calculateFee() {
    double registrationFee = 1000;
    double subjectFee = numberOfSubjects * 800;
```

```

double totalFee = registrationFee + subjectFee;

if (numberOfSubjects > 5) {
    totalFee = totalFee - (totalFee * 0.20); // 20% scholarship
}

return totalFee;
}

// Method to display student details
public void displayDetails() {
    System.out.println("Enrollment ID: " + enrollmentId);
    System.out.println("Student Name: " + studentName);
    System.out.printf("Final Fee: %.1f\n", calculateFee());
}
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = Integer.parseInt(sc.nextLine());

        StudentEnrollment[] students = new StudentEnrollment[N];

        for (int i = 0; i < N; i++) {
            int id = Integer.parseInt(sc.nextLine());
            String name = sc.nextLine();
            int subjects = Integer.parseInt(sc.nextLine());

            students[i] = new StudentEnrollment(id, name, subjects);
        }

        for (StudentEnrollment student : students) {
            student.displayDetails();
        }

        sc.close();
    }
}

```

**Status :** Correct

**Marks :** 10/10

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

### REC\_2028\_OOPS using Java\_Week 6\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 12

#### Section 1 : MCQ

1. What will be the output of the following program?

```
class A {  
    int x = 10;  
}
```

```
class B extends A {  
    int x = 20;  
}
```

```
class C extends B {  
    int x = 30;
```

```
    void display() {  
        System.out.println(x);  
        System.out.println(super.x);  
    }
```



```
}  
}  
}  
class Test {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.display();  
    }  
}
```

**Answer**

3020

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    int sum(int x) {  
        return x + 2;  
    }  
}
```

```
class B extends A {  
    int sum(int x) {  
        return super.sum(x) * 2;  
    }  
}
```

```
class C extends B {  
    int sum(int x) {  
        return super.sum(x) - 3;  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        C obj = new C();  
        System.out.println(obj.sum(4));  
    }  
}
```

**Answer**

9

**Status :** Correct

**Marks :** 1/1

3. Which of the following is true about method overriding in Java?

**Answer**

The method must have the same name, same parameters, and must be in different classes with an inheritance relationship

**Status :** Correct

**Marks :** 1/1

4. What will be the output of the following Java program?

```
class Test {  
    void show(int a) {  
        System.out.println("Integer method");  
    }  
    void show(String s) {  
        System.out.println("String method");  
    }  
    public static void main(String[] args) {  
        Test obj = new Test();  
        obj.show(null);  
    }  
}
```

**Answer**

String method

**Status :** Correct

**Marks :** 1/1

5. What will be the output of the following Java program?

```
class Vehicle {  
    void startEngine() {  
        System.out.println("Vehicle engine started");  
    }  
}
```

```
class Car extends Vehicle {  
    void startEngine() {  
        System.out.println("Car engine started");  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        Vehicle myVehicle = new Car();  
        myVehicle.startEngine();  
    }  
}
```

**Answer**

Vehicle engine started

**Status : Wrong**

**Marks : 0/1**

6. What will be the output of the following Java program?

```
class A {  
    int value = 10;  
    void display() {  
        System.out.println("A's display: " + value);  
    }  
}  
class B extends A {  
    int value = 20;  
    void display() {  
        System.out.println("B's display: " + value);  
    }  
}  
class Test {
```

```
public static void main(String[] args) {  
    A obj = new B();  
    obj.display();  
    System.out.println("Value: " + obj.value);  
}  
}
```

**Answer**

B's display: 20 Value: 10

**Status :** Correct

**Marks :** 1/1

7. What will be the output of the following Java program?

```
class A {  
    void display() {  
        System.out.println("Class A");  
    }  
}
```

```
class B extends A {  
    void show() {  
        System.out.println("Class B");  
    }  
}
```

```
class C extends B {  
    void print() {  
        System.out.println("Class C");  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.display();  
        obj.show();  
        obj.print();  
    }  
}
```

```
}
```

**Answer**

Class AClass BClass C

**Status :** Correct

**Marks :** 1/1

8. What will be the output of the following program?

```
class Vehicle {  
    String type = "Vehicle";  
}  
  
class Car extends Vehicle {  
    String type = "Car";  
}  
  
class Test {  
    public static void main(String[] args) {  
        Car c = new Car();  
        System.out.println(c.type);  
    }  
}
```

**Answer**

Car

**Status :** Correct

**Marks :** 1/1

9. What will be the output of the following Java program?

```
class Parent {  
    void show() {  
        System.out.println("Parent class");  
    }  
}  
  
class Child extends Parent {  
    void show() {  
        System.out.println("Child class");  
    }  
}
```

```

    }
}
class Test {
    public static void main(String[] args) {
        Parent obj = new Child();
        obj.show();
    }
}

```

**Answer**

Compilation error

**Status : Wrong**

**Marks : 0/1**

10. Select the correct keyword for implementing inheritance through the class.

**Answer**

extends

**Status : Correct**

**Marks : 1/1**

11. What will be the output of the following program?

```

class A {
    public int i;
    private int j;
}
class B extends A {
    void display() {
        super.j = super.i + 1;
        System.out.println(super.i + " " + super.j);
    }
}
class inheritance {
    public static void main(String args[]) {
        B obj = new B();
        obj.i=1;
    }
}

```

```
obj.j=2;  
obj.display();  
}  
}
```

**Answer**

Compile Time Error

**Status :** Correct

**Marks :** 1/1

12. What will be the output of the following Java program?

```
class Vehicle {  
    void start() {  
        System.out.println("Vehicle starts");  
    }  
}  
class Car extends Vehicle {  
  
    void start() {  
        System.out.println("Car starts");  
    }  
}  
class ElectricCar extends Car {  
    void start() {  
        System.out.println("Electric Car starts silently");  
    }  
}  
class Test {  
    public static void main(String[] args) {  
        Vehicle v = new ElectricCar();  
        v.start();  
    }  
}
```

**Answer**

Electric Car starts silently

**Status :** Correct

**Marks :** 1/1

13. Which of the following is the correct way for class B to inherit from class A?

**Answer**

class B extends A {}

**Status :** Correct

**Marks :** 1/1

14. What will be the output of the following Java program?

```
class Test {  
    void display(int a, int b) {  
        System.out.println("Method 1");  
    }  
    void display(double a, double b) {  
        System.out.println("Method 2");  
    }  
    public static void main(String[] args) {  
        Test obj = new Test();  
        obj.display(10, 10.0);  
    }  
}
```

**Answer**

Method 2

**Status :** Correct

**Marks :** 1/1

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

```
class A {  
    void display() {  
        System.out.println("Display A");  
    }  
}
```

```
class B extends A {  
    void display() {
```



```
        System.out.println("Display B");
    }
}

class C extends B {
    void display() {
        super.display();
    }
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        obj.display();
    }
}
```

**Answer**

Display BDisplay A

**Status : Wrong**

**Marks : 0/1**

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

### 2028\_REC\_OOPS using Java\_Week 6\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Elsa subscribes to a premium service with a base monthly cost, a service tax and an extra feature cost. Assist her in writing an inheritance program that takes input for these values and calculates the total monthly cost.

Refer to the below class diagram:

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

The first line of input consists of a double value, representing the base monthly cost.

The second line consists of a double value, representing the service tax.

The third line consists of a double value, representing the extra feature cost.

### **Output Format**

The output prints "Rs. X" where X is a double value, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 10.0

2.5

5.0

Output: Rs. 17.50

### **Answer**

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

```
class Subscription {  
    public double baseMonthlyCost;  
  
    public Subscription(double baseMonthlyCost) {  
        this.baseMonthlyCost = baseMonthlyCost;  
    }  
}
```

```
class PremiumSubscription extends Subscription {  
    public double serviceTax;  
    public double extraFeatureCost;  
  
    public PremiumSubscription(double baseMonthlyCost, double serviceTax,  
double extraFeatureCost) {  
        super(baseMonthlyCost);  
        this.serviceTax = serviceTax;  
        this.extraFeatureCost = extraFeatureCost;  
    }  
  
    public double calculateMonthlyCost() {  
        // Total cost is the sum of all three components.  
        return baseMonthlyCost + serviceTax + extraFeatureCost;  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double baseMonthlyCost = scanner.nextDouble();  
        double serviceTax = scanner.nextDouble();  
        double extraFeatureCost = scanner.nextDouble();  
  
        PremiumSubscription premiumSubscription = new  
PremiumSubscription(baseMonthlyCost, serviceTax, extraFeatureCost);  
  
        double totalMonthlyCost = premiumSubscription.calculateMonthlyCost();  
        System.out.printf("Rs. %.2f%n", totalMonthlyCost);  
        scanner.close();  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 6\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Alice is managing an online store and wants to implement a program using inheritance to calculate the selling price of products after applying discounts.

Guide her by following the instructions:

Create a base class called Product with a public double attribute price. Create a subclass called DiscountedProduct, which extends Product and includes a private double attribute discount rate. This subclass has a method called calculateSellingPrice() to determine the final selling price after applying the discount.

Formula: Discounted selling price = price \* (1 - discount rate)

***Input Format***

The first line of input consists of a double value p, the initial price of the product.

The second line consists of a double value d, the discount rate.

### **Output Format**

The output prints "Rs. X", where X is a double value, representing the calculated discounted selling price, rounded off to two decimal places.

If the discount rate is greater than 1, print "Not applicable".

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 50.00

0.20

Output: Rs. 40.00

### **Answer**

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

```
class Product {  
    public double price;  
    public Product(double price) {  
        this.price = price;  
    }  
}
```

```
class DiscountedProduct extends Product {  
    private double discountRate;  
    public DiscountedProduct(double price, double discountRate) {  
        super(price);  
        this.discountRate = discountRate;  
    }  
    public double calculateSellingPrice() {  
        if (discountRate > 1.00) {  
            return -1.0;  
        }  
        return price * (1.0 - discountRate);  
    }  
}
```

```
}
```

```
class ProductPricing {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double initialPrice = scanner.nextDouble();  
        double discountRate = scanner.nextDouble();  
        DiscountedProduct discountedProduct = new  
DiscountedProduct(initialPrice, discountRate);  
        double sellingPrice = discountedProduct.calculateSellingPrice();  
  
        if (sellingPrice >= 0) {  
            System.out.printf("Rs. %.2f%n", sellingPrice);  
        } else {  
            System.out.println("Not applicable");  
        }  
        scanner.close();  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 6\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Preethi is working on a project to automate sales tax calculations for items in a store. She wants to create a program that takes the price of an item and the sales tax rate as input and calculates the final price of the item after applying the sales tax.

Write a program using the class SalesTaxCalculator, which contains an overloaded method named calculateFinalPrice to handle both integer and double inputs. The program should also include a Main class that takes user input, calls the appropriate method from SalesTaxCalculator, and prints the final price of the item.

Formula Used: Final price = price + ((price \* sales tax rate) / 100)

**Input Format**



The first line of input consists of an integer price (the price of the item for integer inputs).

The second line of input consists of an integer taxRate (the sales tax rate for integer inputs).

The third line of input consists of a double price (the price of the item for double inputs).

The fourth line of input consists of a double taxRate (the sales tax rate for double inputs).

### ***Output Format***

The first line of output prints an integer, representing the final price of the item after applying the sales tax for integer inputs (a and b).

The second line prints a double value, representing the final price of the item after applying the sales tax for double-value inputs (m and n), rounded to two decimal places.

Refer to the sample output for formatting specifications.

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

Input: 100

10

100.0

5.0

Output: 110

105.00

### ***Answer***

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

```
class SalesTaxCalculator {
```

```
    public static int calculateFinalPrice(int x,int y){
```

```
        return x+((x*y)/100);
```

```
    }
```

```
    public static double calculateFinalPrice(double x,double y){
```

```
        return x+((x*y)/100);
```

```
}  
}  
class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        int intPrice = scanner.nextInt();  
        int intTaxRate = scanner.nextInt();  
        double doublePrice = scanner.nextDouble();  
        double doubleTaxRate = scanner.nextDouble();  
  
        int finalPriceInt = SalesTaxCalculator.calculateFinalPrice(intPrice,  
intTaxRate);  
        double finalPriceDouble =  
SalesTaxCalculator.calculateFinalPrice(doublePrice, doubleTaxRate);  
  
        System.out.println(finalPriceInt);  
        System.out.format("%.2f", finalPriceDouble);  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 6\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Mr.Kapoor wants to create a program to calculate the volume of a Cuboid and a Cube using method overriding.

Implements a base class Cuboid with attributes for length, width, and height. Include a method calculateVolume() that computes the volume of the cuboid.

Extends the base class with a subclass Cube representing a cube, where all sides are equal. Override the calculateVolume() method in the Cube class to compute the volume of the cube.

The program should take user input for the dimensions of the cuboid and the side length of the cube and display the calculated volumes with two decimal places.

### ***Input Format***

The first line of input consists of 3 space-separated double values, representing the cuboid length, width, and height, respectively.

The second line consists of a double value, representing the side length of the cube.

### ***Output Format***

The first line of output prints the volume of the cuboid, rounded off to two decimal places.

The second line prints the volume of the cube, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

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

Input: 60.0 60.0 60.0  
50.0

Output: Volume of Cuboid: 216000.00  
Volume of Cube: 125000.00

### ***Answer***

```
import java.util.Scanner;

class Cuboid {
    protected double length;
    protected double width;
    protected double height;

    public Cuboid(double length, double width, double height) {
        this.length = length;
        this.width = width;
        this.height = height;
    }

    public double calculateVolume() {
        return length * width * height;
    }
}
```

```

    }
}

class Cube extends Cuboid {
    public Cube(double side) {
        super(side, side, side);
    }

    @Override
    public double calculateVolume() {
        return length * length * length;
    }
}

```

```

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

        double cuboidLength = scanner.nextDouble();
        double cuboidWidth = scanner.nextDouble();
        double cuboidHeight = scanner.nextDouble();

        // Regular object instantiation for Cuboid
        Cuboid cuboid = new Cuboid(cuboidLength, cuboidWidth, cuboidHeight);
        System.out.printf("Volume of Cuboid: %.2f\n", cuboid.calculateVolume());

        double cubeSide = scanner.nextDouble();

        // Upcasting - Using superclass reference for subclass object (DMD)
        Cuboid cube = new Cube(cubeSide); // Upcasting
        System.out.printf("Volume of Cube: %.2f", cube.calculateVolume()); // Calls
        Cube's method dynamically

        scanner.close();
    }
}

```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 6\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem statement:

Tim was tasked with developing a grocery shopping app. You have a class hierarchy that includes Item, Produce, and OrganicProduce. Your goal is to calculate the total cost of a shopping list, which may contain a mix of regular produce and organic produce items. Additionally, you need to apply discounts to organic items. Apply a 10% discount on organic produce items

Class Hierarchy:

Item: Base class for all items.

Produce: Subclass of Item for regular produce items.

OrganicProduce: Subclass of Produce for organic produce items.

### ***Input Format***

The first line of input consists of an integer, 'n'.

For each 'n' item, the user will provide:

- A string 'type' representing the item type ('Regular' or 'Organic').
- A string 'name' represents the item name.
- A double 'price' represents the item price.

### ***Output Format***

The output will display the total cost of the shopping list, including discounts on organic items.

Refer to the sample output for format specifications.

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

Input: 1

Regular Banana 1.99

Output: 1.99

### ***Answer***

```
import java.util.Scanner;

class Item {
    protected String name;
    protected double price;

    public Item(String name, double price) {
        this.name = name;
        this.price = price;
    }
    public double calculateCost() {
        return price;
    }
}

class Produce extends Item {
    public Produce(String name, double price) {
        super(name, price);
    }
}
```

```

    }
}
class OrganicProduce extends Produce {
    public OrganicProduce(String name, double price) {
        super(name, price);
    }
    @Override
    public double calculateCost() {
        return price * 0.90;
    }
}

```

```

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

        int n = sc.nextInt();
        sc.nextLine(); // Consume newline

        double totalCost = 0.0;

        for (int i = 0; i < n; i++) {
            String type = sc.next();
            String name = sc.next();
            double price = sc.nextDouble();

            if (type.equals("Regular")) {
                Item item = new Produce(name, price);
                totalCost += item.calculateCost();
            } else if (type.equals("Organic")) {
                Item item = new OrganicProduce(name, price);
                totalCost += item.calculateCost();
            }
        }

        System.out.printf("%.2f%n", totalCost);
    }
}

```

**Status :** Correct

**Marks :** 10/10



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

### REC\_2028\_OOPS using Java\_Week 7\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 14

#### Section 1 : MCQ

1. If a class implements two interfaces that have the same default method, what must the class do?

**Answer**

The class must override the method to resolve ambiguity.

**Status : Correct**

**Marks : 1/1**

2. What is the output of the following code?

```
interface X {  
    default void show() {  
        System.out.println("X's Default Method");  
    }  
}
```

```
interface Y {  
    default void show() {  
        System.out.println("Y's Default Method");  
    }  
}
```

```
class Z implements X, Y {  
    public void show() {  
        System.out.println("Z's Method");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Z obj = new Z();  
        obj.show();  
    }  
}
```

**Answer**

Z's Method

**Status : Correct**

**Marks : 1/1**

3. Which of the following statements about Java interfaces is true?

**Answer**

A class can implement multiple interfaces.

**Status : Correct**

**Marks : 1/1**

4. What is the output of the following code?

```
interface A {  
    static void display() {  
        System.out.println("Static method in A");  
    }  
}
```

```
}  
class B implements A {  
    static void display() {  
        System.out.println("Static method in B");  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        B.display();  
    }  
}
```

**Answer**

Static method in B

**Status :** Correct

**Marks :** 1/1

5. Which of the following is the correct way to declare an interface in Java?

**Answer**

```
interface Vehicle { void start();}
```

**Status :** Correct

**Marks :** 1/1

6. How can a class explicitly call a default method from an interface if there is a naming conflict?

**Answer**

Using InterfaceName.super.methodName();

**Status :** Correct

**Marks :** 1/1

7. What is the output of the following code?

```
interface A {
```

```
    default void show() {  
        System.out.println("A's Default Method");  
    }  
}
```

```
interface B {  
    default void show() {  
        System.out.println("B's Default Method");  
    }  
}
```

```
class C implements A, B {  
    public void show() {  
        A.super.show();  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.show();  
    }  
}
```

**Answer**

A's Default Method

**Status :** Correct

**Marks :** 1/1

8. Consider a class implementing an interface and extending a class, both having a method with the same name. Which method gets called?

**Answer**

The method from the superclass

**Status :** Correct

**Marks :** 1/1

9. What is the output of the following code?

```
interface MathOperations {
    static int square(int x) {
        return x * x;
    }
}

public class Main {
    public static void main(String[] args) {
        System.out.println(MathOperations.square(5));
    }
}
```

**Answer**

125

**Status : Wrong**

**Marks : 0/1**

10. What happens when an implementing class does not override a default method from an interface?

**Answer**

The default method's implementation from the interface will be used.

**Status : Correct**

**Marks : 1/1**

11. What is the primary purpose of static methods in Java interfaces?

**Answer**

They allow an interface to provide helper methods without requiring an implementing class.

**Status : Correct**

**Marks : 1/1**

12. Can a Java interface contain both default and static methods?

**Answer**

Yes, an interface can have both default and static methods.

**Status :** Correct

**Marks :** 1/1

13. What is the output of the following code?

```
interface A {  
    default void show() {  
        System.out.println("A's Default Method");  
    }  
}
```

```
class B {  
    public void show() {  
        System.out.println("B's Method");  
    }  
}
```

```
class C extends B implements A {  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        C obj = new C();  
        obj.show();  
    }  
}
```

**Answer**

B's Method

**Status :** Correct

**Marks :** 1/1

14. How do you call a static method from an interface MyInterface?

**Answer**

MyInterface.staticMethod();

**Status :** Correct

**Marks :** 1/1

15. Which of the following statements is true regarding default methods in Java interfaces?

**Answer**

A default method can be overridden in a class implementing the interface.

**Status :** Correct

**Marks :** 1/1

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

### 2028\_REC\_OOPS using Java\_Week 7\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement:

Rajiv is analyzing the energy consumption in his household and wants to calculate the total cost based on the daily energy usage. He is given the rate per unit of electricity and the energy consumed for multiple days. To structure this calculation efficiently, he decides to use an interface-based approach.

Implement an interface CostCalculator with the necessary methods to retrieve energy details and compute the cost. The calculations should be handled in the EnergyConsumptionTracker class, while the EnergyConsumptionApp class should only handle input and output.

##### Formula

Energy Cost for one day = Energy Consumed per day \* Rate Per Unit



### ***Input Format***

The first line of input consists of the rate per unit as an 'R' (a double value).

The second line of input consists of the number of days 'N' (an integer).

The third line of input consists of the daily energy consumption values for each day 'D' (double values), separated by space.

### ***Output Format***

The first line of the output prints: "Day-wise Energy Cost:"

The next N lines of the output print the day-wise energy costs(double type) and the total energy cost (double type) in Indian Rupees in the following format: "Day [day\_number]: Rs. [energy\_cost]"

The last line of the output prints: "Total Energy Cost: Rs. [total\_cost]"

Note: energy\_cost and total\_cost are rounded off to two decimal points

Refer to the sample output for the formatting specifications.

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

Input: 0.01

3

10.0 20.0 30.0

Output: Day-wise Energy Cost:

Day 1: Rs. 0.10

Day 2: Rs. 0.20

Day 3: Rs. 0.30

Total Energy Cost: Rs. 0.60

### ***Answer***

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

```
interface CostCalculator {
```

```
void getEnergyDetails(Scanner scanner);  
void calculateAndDisplayCost();  
}
```

```
class EnergyConsumptionTracker implements CostCalculator {  
    private double ratePerUnit;  
    private int numDays;  
    private double[] dailyConsumption;
```

```
    public EnergyConsumptionTracker(double ratePerUnit, int numDays) {  
        this.ratePerUnit = ratePerUnit;  
        this.numDays = numDays;  
        this.dailyConsumption = new double[numDays];  
    }
```

```
    @Override  
    public void getEnergyDetails(Scanner scanner){  
        for (int i = 0; i < numDays; i++) {  
            if (scanner.hasNextDouble()) {  
                this.dailyConsumption[i] = scanner.nextDouble();  
            } else {  
                break;  
            }  
        }  
    }  
}
```

```
    @Override  
    public void calculateAndDisplayCost() {  
        double totalEnergyCost = 0.0;
```

```
        System.out.println("Day-wise Energy Cost:");
```

```
        for (int i = 0; i < numDays; i++) {  
            double dailyCost = dailyConsumption[i] * ratePerUnit;  
            totalEnergyCost += dailyCost;
```

```
            // Using printf without an explicit Locale relies on the system default  
            System.out.printf("Day %d: Rs. %.2f%n", (i + 1), dailyCost);  
        }
```

```
        System.out.printf("Total Energy Cost: Rs. %.2f%n", totalEnergyCost);  
    }  
}
```

```
}
```

```
class EnergyConsumptionApp {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double ratePerUnit = scanner.nextDouble();  
        int numDays = scanner.nextInt();  
  
        CostCalculator tracker = new EnergyConsumptionTracker(ratePerUnit,  
numDays);  
  
        tracker.getEnergyDetails(scanner);  
        tracker.calculateAndDisplayCost();  
  
        scanner.close();  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 7\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Jaheer is working on a health monitoring system to help individuals calculate their Body Mass Index (BMI). He has implemented a basic BMI calculator and an interface called HealthCalculator. It should have a method called calculateBMI.

You are tasked with creating a program that takes weight and height as input, calculates the BMI using the BMI Calculator class, and displays the result. If the height or weight is less than or equal to zero, then return -1.

Formula:  $BMI = \text{weight} / (\text{height} * \text{height})$

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

The first line of input consists of a double value W, the person's weight in kilograms.

The second line consists of a double value H, the height of the person in meters.

### **Output Format**

The output displays "BMI: " followed by a double value, representing the calculated BMI, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 70.0

1.75

Output: BMI: 22.86

### **Answer**

```
import java.util.Scanner;

interface HealthCalculator {
    double calculateBMI(double weight, double height);
}

class BMICalculator implements HealthCalculator {
    @Override
    public double calculateBMI(double weight, double height) {
        if (weight <= 0 || height <= 0) {
            return -1.0;
        }
        return weight / (height * height);
    }
}

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

        double weight = scanner.nextDouble();
        double height = scanner.nextDouble();

        BMICalculator bmiCalculator = new BMICalculator();
```

```
double bmi = bmiCalculator.calculateBMI(weight, height);  
  
System.out.printf("BMI: %.2f\n", bmi);  
  
    scanner.close();  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 7\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

A financial analyst, Alex, needs a program to calculate simple interest for various financial transactions. He requires a straightforward tool that takes in the principal amount, interest rate, and time in years and computes the interest.

The formula to be used is:  $\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time} / 100$

Implement this functionality using the InterestCalculator interface and the SimpleInterestCalculator class.

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

The first line of input consists of the principal amount P as a double value.

The second line of input consists of the annual interest rate  $r$  as a double value.

The third line of input consists of the number of years  $t$  as a positive integer, which is an integer value.

### ***Output Format***

The output displays the calculated simple interest in the following format: "Simple Interest: [interest\_value]", Here, [interest\_value] should be replaced with the actual interest value calculated by the program.

Refer to the sample output for the formatting specifications.

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

Input: 1000.00

5.00

2

Output: Simple Interest: 100.0

### ***Answer***

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

```
interface InterestCalculator {  
    double simpleInterest(double principal, double rate, int time);  
}
```

```
class SimpleInterestCalculator implements InterestCalculator {  
    @Override  
    public double simpleInterest(double principal, double rate, int time) {  
        return (principal * rate * time) / 100.0;  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double principal = scanner.nextDouble();  
  
        double rate = scanner.nextDouble();
```



```
int time = scanner.nextInt();  
InterestCalculator calculator = new SimpleInterestCalculator();  
double interest = calculator.simpleInterest(principal, rate, time);  
System.out.println("Simple Interest: " + interest);  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 7\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Maria, a software developer, is working on an inventory management system project using Java that utilizes an inventory interface to manage a store's products.

The interface should define two methods: `addProduct`, which adds a product by accepting its name, price, and quantity, and `calculateTotalValue`, which computes the total value of all products in the inventory. Implement the interface in a class called `SimpleInventory`, which internally manages a list of `Product` objects.

Each `Product` object should encapsulate the product's name, price, and quantity and include a method to calculate its value as  $\text{price} \times \text{quantity}$ . The system should allow users to dynamically add products to the inventory and calculate the total value of all products stored.

Help Maria achieve the task.

### ***Input Format***

The first line of input consists of an integer to choose one of the following options:

- 1 - to add a product to the inventory.
- 2 - to calculate and view the total inventory value.
- 3 - to exit the program.

For Choice 1 (Add Product):

The next input line is the string representing the product name as a string (single or multi-word, without quotes).

The next line is a double value representing the price as a decimal value

The next line is an integer value representing the quantity as an integer

For Choices 2 and 3, no additional input is required

### ***Output Format***

The output displays the results of the commands as follows:

- For the addProduct command, the program should display "Product added to inventory."
- For choice 2, the program should display "Total inventory value [totalvalue].  
"The total value should be displayed with one decimal place. If there is no product in the inventory, print the total as 0.0.
- For choice 3, the program should exit

If the choice is not 1, 2, or 3, then print "Invalid choice. Please select a valid option (1/2/3).".

Refer to the sample output for the formatting specifications.

### Sample Test Case

Input: 1

Laptop

800.0

3

2

5

3

Output: Product added to inventory.

Total inventory value: \$2400.0

Invalid choice. Please select a valid option (1/2/3).

### Answer

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

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

```
import java.util.ArrayList;
```

```
import java.util.List;
```

```
import java.text.DecimalFormat;
```

```
class Product {
```

```
    private String name;
```

```
    private double price;
```

```
    private int quantity;
```

```
    public Product(String name, double price, int quantity) {
```

```
        this.name = name;
```

```
        this.price = price;
```

```
        this.quantity = quantity;
```

```
    }
```

```
    public double calculateValue() {
```

```
        return price * quantity;
```

```
    }
```

```
}
```

```
interface Inventory {
```

```
    void addProduct(String name, double price, int quantity);
```

```
    double calculateTotalValue();
```

```
}
```

```
class SimpleInventory implements Inventory {
```

```
private List<Product> products;  
private int maxCapacity;
```

```
public SimpleInventory(int maxCapacity) {  
    this.products = new ArrayList<>();  
    this.maxCapacity = maxCapacity;  
}
```

```
@Override  
public void addProduct(String name, double price, int quantity) {  
    Product newProduct = new Product(name, price, quantity);  
    products.add(newProduct);  
    System.out.println("Product added to inventory.");  
}
```

```
@Override  
public double calculateTotalValue() {  
    double totalValue = 0.0;  
    for (Product product : products) {  
        totalValue += product.calculateValue();  
    }  
    return totalValue;  
}  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        Inventory inventory = new SimpleInventory(10);  
        while (true) {  
            int choice = scanner.nextInt();  
            if (choice == 1) {  
                scanner.nextLine();  
                String productName = scanner.nextLine();  
                double price = scanner.nextDouble();  
                int quantity = scanner.nextInt();  
                inventory.addProduct(productName, price, quantity);  
            } else if (choice == 2) {  
                double totalValue = inventory.calculateTotalValue();  
                System.out.println("Total inventory value: $" + totalValue);  
            } else if (choice == 3) {  
                break;  
            }  
        }  
    }  
}
```

```
    } else {  
        System.out.println("Invalid choice. Please select a valid option  
(1/2/3).");  
    }  
}  
scanner.close();  
}  
}
```

**Status :** Correct

**Marks : 10/10**

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

### 2028\_REC\_OOPS using Java\_Week 7\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Raj is curious about how old he is in the current year.

He has asked you to create a simple program that calculates a person's age based on their birth year. You decide to implement this functionality using the AgeCalculator interface and the HumanAgeCalculator class.

Note: The current year is 2024. Calculate the current age by using the formula: current year - birth year.

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

The input consists of an integer representing the birth year.

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

The output displays "You are X years old." where X is an integer representing the calculated age based on the entered birth year.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 1934

Output: You are 90 years old.

### **Answer**

```
import java.util.Scanner;

interface AgeCalculator {
    int calculateAge(int birthYear);
}

class HumanAgeCalculator implements AgeCalculator {
    private static final int CURRENT_YEAR = 2024;

    @Override
    public int calculateAge(int birthYear) {
        return CURRENT_YEAR - birthYear;
    }
}

class AgeCalculatorApp {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        AgeCalculator ageCalculator = new HumanAgeCalculator();

        int birthYear = scanner.nextInt();
        int age = ageCalculator.calculateAge(birthYear);

        System.out.println("You are " + age + " years old.");
    }
}
```

**Status : Correct**

**Marks : 10/10**



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

### REC\_2028\_OOPS using Java\_Week 8\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 13

#### Section 1 : MCQ

1. What will happen if a checked custom exception is thrown inside a method without being caught or declared?

**Answer**

Compilation Error

**Status : Correct**

**Marks : 1/1**

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

```
class InvalidUsernameException extends Exception {  
    public InvalidUsernameException(String message) {  
        super(message);  
    }  
}
```

```

class Test {
    public static void main(String[] args) {
        try {
            String username = "abc";
            if (username.length() < 5) {
                throw new InvalidUsernameException("Username must be at
least 5 characters long");
            }
        } catch (InvalidUsernameException e) {
            System.out.println(e.getMessage());
        }
    }
}

```

**Answer**

Username must be at least 5 characters long

**Status :** Correct

**Marks :** 1/1

3. What will be the output for the following code?

```

import java.io.*;

```

```

class OutOfStockException extends Exception {
    public OutOfStockException(String message) {
        super(message);
    }
}

```

```

class Test {
    public static void main(String[] args) {
        try {
            int stock = 0;
            if (stock == 0) {
                throw new OutOfStockException("Item is out of stock");
            }
        } catch (OutOfStockException e) {
            System.out.println(e.getMessage());
        }
    }
}

```

```
}  
}  
}
```

**Answer**

Out of stock

**Status :** Wrong

**Marks :** 0/1

4. Which keyword is used to explicitly throw a custom exception?

**Answer**

throw

**Status :** Correct

**Marks :** 1/1

5. How do you create an unchecked custom exception?

**Answer**

By extending RuntimeException

**Status :** Correct

**Marks :** 1/1

6. What will be the output for the following code?

```
import java.io.*;
```

```
class TemperatureTooHighException extends Exception {  
    public TemperatureTooHighException(String message) {  
        super(message);  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        try {  
            int temperature = 110;  
            if (temperature > 100) {
```

```
        throw new TemperatureTooHighException("Temperature too  
high");  
    }  
    } catch (TemperatureTooHighException e) {  
        System.out.println(e.getMessage());  
    }  
    }  
}
```

**Answer**

Temperature too high

**Status :** Correct

**Marks :** 1/1

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

```
class MyException extends Exception {  
    public MyException() {  
        super("Default Exception Message");  
    }  
}  
  
class Test {  
    public static void main(String[] args) {  
        try {  
            throw new MyException();  
        } catch (MyException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

**Answer**

Default Exception Message

**Status :** Correct

**Marks :** 1/1

8. What will be the output for the following code?

```
import java.io.*;
```

```
class NegativeAgeException extends Exception {  
    public NegativeAgeException(String message) {  
        super(message);  
    }  
}
```

```
class Test {  
    public static void main(String[] args) {  
        try {  
            int age = -5;  
            if (age < 0) {  
                throw new NegativeAgeException("Age cannot be negative");  
            }  
        } catch (NegativeAgeException e) {  
            System.out.println(e.getMessage());  
        }  
    }  
}
```

**Answer**

Age cannot be negative

**Status :** Correct

**Marks :** 1/1

9. Which of the following is true about custom exceptions?

**Answer**

Custom exceptions must extend either Exception or RuntimeException

**Status :** Correct

**Marks :** 1/1

10. What will be the output for the following code?

```
import java.io.*;
```

```
class UnderageException extends Exception {
```

```

    public UnderageException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int age = 17;
            if (age < 18) {
                throw new UnderageException("Underage, cannot proceed");
            }
        } catch (UnderageException e) {
            System.out.println(e.getMessage());
        }
    }
}

```

**Answer**

Underage, cannot proceed

**Status :** Correct

**Marks :** 1/1

11. What is the purpose of a custom exception in Java?

**Answer**

To create user-defined exceptions for specific scenarios

**Status :** Correct

**Marks :** 1/1

12. What will be the output for the following code?

```

class NegativeBalanceException extends Exception {
    public NegativeBalanceException(String message) {
        super(message);
    }
}

```

```

class Test {
    public static void main(String[] args) {
        try {
            double balance = -500;
            if (balance < 0) {
                throw new NegativeBalanceException("Balance cannot be
negative");
            }
        } catch (NegativeBalanceException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}

```

**Answer**

Error: Balance cannot be negative

**Status :** Correct

**Marks :** 1/1

13. what is the output of the following code?

```

class MyException extends Exception {
    public MyException(String message) {
        super(message);
    }
}

class Test {
    static void check() throws MyException {
        throw new MyException("Custom Exception Occurred");
    }

    public static void main(String[] args) {
        try {
            check();
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
    }
}

```

```
}
```

**Answer**

Custom Exception Occurred

**Status :** Correct

**Marks :** 1/1

14. what is the output of the following code?

```
class MyException extends Exception {  
    public MyException(String message) {  
        super(message);  
    }  
}  
  
class Test {  
    public static void main(String[] args) {  
        try {  
            throw new MyException("Error occurred");  
        } catch (MyException e) {  
            System.out.println(e);  
        }  
    }  
}
```

**Answer**

Exception in thread "main" java.lang.Exception

**Status :** Wrong

**Marks :** 0/1

15. What will be the output for the following code?

```
class InvalidVotingAgeException extends Exception {  
    public InvalidVotingAgeException(String message) {  
        super(message);  
    }  
}  
  
class Test {
```



```
public static void main(String[] args) {  
    try {  
        int age = 15;  
        if (age < 18) {  
            throw new InvalidVotingAgeException("You are not eligible to  
vote");  
        }  
        System.out.println("Eligible to vote");  
    } catch (InvalidVotingAgeException e) {  
        System.out.println(e.getMessage());  
    }  
}
```

**Answer**

You are not eligible to vote

**Status :** Correct

**Marks :** 1/1

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Scan to verify results



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

### 2028\_REC\_OOPS using Java\_Week 8\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Write a program to validate the email address and display suitable exceptions if there is any mistake.

Create 3 custom exception classes as below

DotException AtTheRateException DomainException

A typical email address should have a "." character, and a "@" character, and also the domain name should be valid. Valid domain names for practice be 'in', 'com', 'net', or 'biz'.

Display Invalid Dot usage, Invalid @ usage, or Invalid Domain message based on email id.

Get the email address from the user, validate the email by checking the

above-mentioned criteria, and print the validity status of the input email address.

### ***Input Format***

The first line of input contains the email to be validated.

### ***Output Format***

The output prints a Valid email address or an Invalid email address along with the suitable exception

If email ends with . or contains not exactly one . after @, it throws:

DotException: Invalid Dot usage

Invalid email address

If @ appears not exactly once, it throws:

AtTheRateException: Invalid @ usage

Invalid email address

If the part after the last dot is not among accepted domains:

DomainException: Invalid Domain

Invalid email address

If all conditions satisfied then print:

Valid email address

Refer to the sample input and output for format specifications.

### **Sample Test Case**

Input: sample@gmail.com

Output: Valid email address

### **Answer**

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

```
class DotException extends Exception {
    public DotException(String message) {
        super(message);
    }
}
```

```
class AtTheRateException extends Exception {
    public AtTheRateException(String message) {
        super(message);
    }
}
```

```
class DomainException extends Exception {
    public DomainException(String message) {
        super(message);
    }
}
```

```
class EmailValidator {

    public void validate(String email) throws DotException, AtTheRateException,
    DomainException {
        int atIndex = email.indexOf('@');
        int lastAtIndex = email.lastIndexOf('@');

        if (atIndex == -1 || atIndex != lastAtIndex) {
            throw new AtTheRateException("Invalid @ usage");
        }
    }
}
```

```

    if (email.endsWith(".")) {
        throw new DotException("Invalid Dot usage");
    }

    int lastDotIndex = email.lastIndexOf('.');

    if (lastDotIndex == -1 || lastDotIndex < atIndex) {
        throw new DomainException("Invalid Domain");
    }

    String domainExtension = email.substring(lastDotIndex + 1);
    String[] validDomains = {"in", "com", "net", "biz"};
    boolean domainIsValid = false;

    for (String domain : validDomains) {
        if (domain.equals(domainExtension)) {
            domainIsValid = true;
            break;
        }
    }

    if (!domainIsValid) {
        throw new DomainException("Invalid Domain");
    }
}

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String email = scanner.nextLine();

        EmailValidator validator = new EmailValidator();

        try {
            validator.validate(email);
            System.out.println("Valid email address");
        } catch (DotException e) {
            System.out.println("DotException: " + e.getMessage());
            System.out.println("Invalid email address");
        } catch (AtTheRateException e) {
            System.out.println("AtTheRateException: " + e.getMessage());
        }
    }
}

```

```
        System.out.println("Invalid email address");
    } catch (DomainException e) {
        System.out.println("DomainException: " + e.getMessage());
        System.out.println("Invalid email address");
    } finally {
        scanner.close();
    }
}
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 8\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Elsa, a busy professional, is using a scheduling application to plan her meetings efficiently. The application requires users to input meeting durations in minutes, ensuring that the duration is a positive integer and does not exceed 240 minutes (4 hours). Elsa needs a program to assist her in scheduling meetings securely with proper exception handling.

Create a Java class named ElsaMeetingScheduler. Implement a custom exception: InvalidDurationException for invalid meeting duration entries. Implement the main method to interactively take user input for a meeting duration. Implement the validateMeetingDuration method to validate the meeting duration based on the specified rules and throw a custom exception if the validation fails. Print appropriate success or error messages based on the meeting duration.

Implement a custom exception, `InvalidDurationException`, to handle cases where the entered meeting duration does not meet the specified criteria.

### ***Input Format***

The input consists of an integer value 'n', representing the meeting duration.

### ***Output Format***

The output is displayed in the following format:

If the entered meeting duration meets the specified criteria, the program outputs

"Meeting scheduled successfully!"

If the entered meeting duration is invalid, the program outputs an error message indicating the issue.

"Error: Invalid meeting duration. Please enter a positive integer not exceeding 240 minutes (4 hours)."

Refer to the sample output for formatting specifications.

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

Input: 120

Output: Meeting scheduled successfully!

### ***Answer***

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

```
class InvalidDurationException extends Exception {
    public InvalidDurationException(String message) {
        super(message);
    }
}
```

```
class ElsaMeetingScheduler {

    public void validateMeetingDuration(int duration) throws
```



```
InvalidDurationException {  
    if (duration <= 0 || duration > 240) {  
        throw new InvalidDurationException("Error: Invalid meeting duration.  
Please enter a positive integer not exceeding 240 minutes (4 hours).");  
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
  
    int duration = scanner.nextInt();  
  
    ElsaMeetingScheduler scheduler = new ElsaMeetingScheduler();  
  
    try {  
        scheduler.validateMeetingDuration(duration);  
  
        System.out.println("Meeting scheduled successfully!");  
  
    } catch (InvalidDurationException e) {  
  
        System.out.println(e.getMessage());  
  
    } finally {  
        scanner.close();  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 8\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

In a user registration system, there is a requirement to implement a username validation module. Users attempting to register must adhere to specific criteria for their usernames to be considered valid.

Your task is to develop a program that takes user input for a desired username and validates it according to the following rules:

The username must not contain any spaces. The username must be at least 5 characters long.

Implement a custom exception, `InvalidUsernameException`, to handle cases where the entered username does not meet the specified criteria.

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

The input consists of a string S, representing the desired username.

### **Output Format**

If the username is valid, print "Username is valid: [S]".

If the username is invalid:

1. If the username is short, print "Invalid Username: Username must be at least 5 characters long"
2. If the username contains spaces, print "Invalid Username: Username cannot contain spaces"

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: John

Output: Invalid Username: Username must be at least 5 characters long

### **Answer**

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

```
class InvalidUsernameException extends Exception {
    public InvalidUsernameException(String message) {
        super(message);
    }
}
```

```
class UsernameValidator {
```

```
    public void validate(String username) throws InvalidUsernameException {

        if (username.contains(" ")) {
            throw new InvalidUsernameException("Invalid Username: Username
cannot contain spaces");
        }
    }
```

```
        if (username.length() < 5) {
            throw new InvalidUsernameException("Invalid Username: Username must
```

be at least 5 characters long");

```
}  
}  
}
```

```
class Main {
```

```
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);
```

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

```
        UsernameValidator validator = new UsernameValidator();
```

```
        try {  
            validator.validate(username);
```

```
            System.out.println("Username is valid: " + username);
```

```
        } catch (InvalidUsernameException e) {
```

```
            System.out.println(e.getMessage());
```

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

```
        }  
    }  
}
```

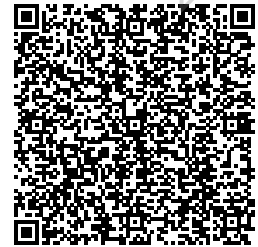
**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 8\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

A local municipality is implementing an online voting system for a community event and wants to ensure that only eligible voters (those aged 18 or older) can participate.

Your task is to develop a program that validates the age of individuals attempting to vote online. If the user's age is below 18, the program should throw a custom exception, `InvalidAgeException`, preventing them from casting their vote. If the input is invalid, catch the appropriate `InputMismatchException` and print the in-built exception message.

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

The input consists of an integer representing the age.

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

If the age is 18 or older, print "Eligible to vote"

If the age is below 18, print "Exception occurred: InvalidAgeException: Age is not valid to vote"

If there is any other type of exception, print "An error occurred: " followed by the in-built exception message.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 20

Output: Eligible to vote

### **Answer**

// You are using Java

import java.util.Scanner;

import java.util.InputMismatchException;

```
class InvalidAgeException extends Exception {  
    public InvalidAgeException(String message) {  
        super(message);  
    }  
}
```

```
class VoterValidator {  
    public void validateAge(int age) throws InvalidAgeException {  
        if (age < 18) {  
            throw new InvalidAgeException("Age is not valid to vote");  
        }  
    }  
}
```

```
class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
        VoterValidator validator = new VoterValidator();  
  
        try {
```

```
int age = scanner.nextInt();  
  
    validator.validateAge(age);  
  
    System.out.println("Eligible to vote");  
  
    } catch (InvalidAgeException e) {  
        System.out.println("Exception occurred: InvalidAgeException: " +  
e.getMessage());  
    } catch (InputMismatchException e) {  
        System.out.println("An error occurred: " + e.getClass().getName());  
    } finally {  
        scanner.close();  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 8\_Q5

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

In a file management system, users are required to provide a valid file name when creating new files. The system enforces specific rules for file names to maintain consistency and avoid potential issues. Your task is to implement a Java program named FileNameValidator that takes user input for a file name and validates it according to the specified rules.

Rules for Valid File Name:

The file name must consist of alphanumeric characters (letters and digits) only. The file name must have a minimum length of 3 characters.

Implement a custom exception, FileNameValidator, to handle cases where the entered filename does not meet the specified criteria.

**Input Format**



The input consists of a string S, representing the desired filename.

### **Output Format**

The output is displayed in the following format:

If the entered file name meets the specified criteria, the program outputs

"Valid file name"

If the entered file name does not meet the criteria and triggers the InvalidFileNameException, the program outputs

"Error: Invalid file name. It must be alphanumeric and have a minimum length of 3 characters."

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: myfile123

Output: Valid file name

### **Answer**

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

```
class InvalidFileNameException extends Exception {
    public InvalidFileNameException(String message) {
        super(message);
    }
}
```

```
class FileNameValidator {
```

```
    public void validate(String fileName) throws InvalidFileNameException {
```

```
        if (fileName.length() < 3) {
            throw new InvalidFileNameException("Error: Invalid file name. It must be
            alphanumeric and have a minimum length of 3 characters.");
        }
    }
}
```

```
        for (char c : fileName.toCharArray()) {  
            if (!Character.isLetterOrDigit(c)) {  
                throw new InvalidFileNameException("Error: Invalid file name. It must  
be alphanumeric and have a minimum length of 3 characters.");  
            }  
        }  
    }  
}
```

```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    String fileName = scanner.nextLine();
```

```
    FileNameValidator validator = new FileNameValidator();
```

```
    try {  
        validator.validate(fileName);
```

```
        System.out.println("Valid file name");
```

```
    } catch (InvalidFileNameException e) {
```

```
        System.out.println(e.getMessage());
```

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

**Status :** Correct

**Marks :** 10/10

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

### REC\_2028\_OOPS using Java\_Week 9\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 13

#### Section 1 : MCQ

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

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(10);
        list.add(20);
        list.add(30);
        list.remove(1);
        System.out.println(list);
    }
}
```

**Answer**

[10, 30]

**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) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.add(5);
        System.out.println(list.get(3));
    }
}
```

**Answer**

4

**Status :** Correct

**Marks :** 1/1

3. What does the addFirst() method of LinkedList do?

**Answer**

Adds an element to the beginning of the list

**Status :** Correct

**Marks :** 1/1

4. How can you access the first element of an ArrayList named as list?

**Answer**

list.get(0);

**Status :** Correct

**Marks :** 1/1

5. What is the correct way to create an ArrayList in Java?

**Answer**

```
ArrayList<String> list = new ArrayList<>();
```

**Status :** Correct

**Marks :** 1/1

6. Which of the following methods removes and returns the last element from a LinkedList?

**Answer**

```
removeLast()
```

**Status :** Correct

**Marks :** 1/1

7. Which method is used to add an element to the top of the stack?

**Answer**

```
push()
```

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<>();
        list.add("apple");
        list.add("banana");
        list.add("cherry");
        list.add("banana");
        System.out.println(list.lastIndexOf("banana"));
    }
}
```

**Answer**

3

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.ArrayList;

public class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(10);
        list.add(20);
        list.add(30);
        System.out.println("Size of the list: " + list.size());
    }
}
```

**Answer**

Size of the list: 3

**Status :** Correct

**Marks :** 1/1

10. What is Collection in Java?

**Answer**

A group of interfaces

**Status :** Wrong

**Marks :** 0/1

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

```
import java.util.ArrayList;

public class Main {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<>();
        list.add("Apple");
        list.add("Banana");
        list.remove("Apple");
        System.out.println(list);
    }
}
```

**Answer**

[Banana]

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<>();
        list.add("Java");
        list.add("Python");
        list.add("Java");
        list.add("C++");
        System.out.println(list.indexOf("Java"));
    }
}
```

**Answer**

0

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Stack<Integer> s = new Stack<>();
        s.push(10);
        s.push(20);
        s.push(30);
        System.out.println(s.peek());
    }
}
```

**Answer**

30

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Stack<Integer> stack = new Stack<>();
        for (int i = 1; i <= 3; i++)
            stack.push(i * 2);
        stack.pop();
        stack.push(10);
        System.out.println(stack.peek());
    }
}
```

**Answer**

10

**Status :** Correct

**Marks :** 1/1

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

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.set(2, 10);
        System.out.println(list);
    }
}
```



**Answer**

[1, 2, 3, 4]

**Status : Wrong**

**Marks : 0/1**

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

### 2028\_REC\_OOPS using Java\_Week 9\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Bobby is tasked with processing a sequence of numbers from a monitoring system. He needs to extract a strictly increasing subsequence using an ArrayList. The program should dynamically add numbers to the ArrayList only if they are greater than the last number currently stored in the list. Bobby aims to efficiently utilize the dynamic resizing and indexing features of the ArrayList to solve this problem.

Help Bobby implement this solution.

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

The first line of input consists of an integer N, representing the number of elements.

The second line consists of N space-separated integers, representing the elements.

### **Output Format**

The output prints the list of integers in increasing sequence, ignoring out-of-order elements.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 7

3 5 9 1 11 7 13

Output: [3, 5, 9, 11, 13]

### **Answer**

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

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = 0;
        if (sc.hasNextInt()) {
            N = sc.nextInt();
        }

        ArrayList<Integer> result = new ArrayList<>();

        for (int i = 0; i < N; i++) {
            if (!sc.hasNextInt()) break;
            int num = sc.nextInt();
            if (result.isEmpty() || num > result.get(result.size() - 1)) {
                result.add(num);
            }
        }

        System.out.println(result);
        sc.close();
    }
}
```

}

**Status :** Correct

**Marks :** 10/10

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

### 2028\_REC\_OOPS using Java\_Week 9\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Vikram loves listening to music and wants to create a simple playlist manager using Java Collections. The playlist supports the following operations:

"ADD <song>" Adds the song to the end of the playlist. "REMOVE <song>" Removes the first occurrence of the song from the playlist. If the song is not found, do nothing. "SHOW" Displays all songs in the playlist in order. If the playlist is empty, print "EMPTY". "NEXT" Moves to the next song in the playlist and prints its name. If the playlist is empty, print "EMPTY".

The playlist maintains a "current song" position that starts at the first song when it's added. The NEXT command moves to the next song and prints it, wrapping around to the first song after reaching the last song. When removing songs, the current position adjusts accordingly to maintain

proper navigation.

Help Vikram implement this playlist manager.

### ***Input Format***

The first line of the input consists of an integer n, the number of operations.

The next n lines, each containing a command:

- "ADD <song>"
- "REMOVE <song>"
- "SHOW"
- "NEXT"

### ***Output Format***

For each "SHOW" command, print the songs in order, separated by spaces.

For each "NEXT" command, print the next song in the playlist.

If no song exists, print "EMPTY".

Refer to the sample output for formatting specifications.

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

Input: 7

ADD song1

ADD song2

SHOW

NEXT

REMOVE song2

SHOW

NEXT

Output: song1 song2

song2

song1

song1

### ***Answer***

```
// You are using Java
import java.util.*;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();
```

```
        LinkedList<String> list = new LinkedList<>();
        int cur = -1;
```

```
        for (int i = 0; i < n; i++) {
            String line = sc.nextLine().trim();
            String[] parts = line.split("\\s+", 2);
            String cmd = parts[0];
```

```
            if (cmd.equals("ADD")) {
                list.add(parts[1]);
                if (cur == -1) cur = 0;
            }
```

```
            else if (cmd.equals("REMOVE")) {
                String song = parts[1];
                int idx = list.indexOf(song);
                if (idx != -1) {
                    list.remove(song);
                    if (list.isEmpty()) cur = -1;
                    else if (idx < cur) cur--;
                    else if (idx == cur) {
                        if (cur >= list.size()) cur = 0;
                    }
                }
            }
```

```
            else if (cmd.equals("SHOW")) {
                if (list.isEmpty()) System.out.println("EMPTY");
                else {
                    for (String s : list) System.out.print(s + " ");
                    System.out.println();
                }
            }
```

```
            else if (cmd.equals("NEXT")) {
                if (list.isEmpty()) System.out.println("EMPTY");
```

```
        else {  
            cur = (cur + 1) % list.size();  
            System.out.println(list.get(cur));  
        }  
    }  
}  
  
sc.close();  
}  
}
```

**Status :** Correct

**Marks : 10/10**



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

### 2028\_REC\_OOPS using Java\_Week 9\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Assist Pranitha in developing a program that takes an integer N as input, representing the number of names to be read. Then read N names and store them in an ArrayList. Finally, input a search string and output the frequency of that string in the list of names.

Note: Some parts of the code are provided as snippets, and you need to complete the remaining sections by writing the necessary code.

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

The first line of input consists of an integer N, representing the number of names to be read.

The following N lines consist of N names, as a string.

The last line consists of a string, representing the name to be searched.

### **Output Format**

The output prints a single integer, representing the frequency of the specified name in the given list.

If the specified name is not found, print 0.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

Alice

Bob

Ankit

Alice

Pranitha

Alice

Output: 2

### **Answer**

// You are using Java

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

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

```
  
        int N = sc.nextInt();  
        sc.nextLine();
```

```
  
        ArrayList<String> list = new ArrayList<>();
```

```
  
        for (int i = 0; i < N; i++) {  
            String name = sc.nextLine();  
            list.add(name);  
        }
```

```
  
        String search = sc.nextLine();
```

```
int count = 0;

for (String s : list) {
    if (s.equals(search)) {
        count++;
    }
}

System.out.println(count);
sc.close();
}
```

**Status :** Correct

**Marks : 10/10**

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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 : 13

#### Section 1 : MCQ

1. How does HashSet check for duplicate elements?

**Answer**

Using equals() and hashCode()

**Status : Correct**

**Marks : 1/1**

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

**Answer**

O(1)

**Status : Correct**

**Marks : 1/1**

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

**Answer**

An exception occurs

**Status : Correct**

**Marks : 1/1**

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

**Answer**

The duplicate is ignored

**Status : Correct**

**Marks : 1/1**

5. 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**

6. 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**

7. 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=Banana, C=Cherry}

**Status :** Wrong

**Marks :** 0/1

8. Which of the following is true about HashMap?

**Answer**

It is not synchronized

**Status :** Correct

**Marks :** 1/1

9. Which statement is true about HashSet and TreeSet?

**Answer**

TreeSet provides sorted elements

**Status :** Correct

**Marks :** 1/1

10. Which method removes all elements from a Set?

**Answer**

clear()

**Status :** Correct

**Marks :** 1/1

11. Which of the following is true about TreeMap?

**Answer**

It maintains natural ordering

**Status :** Correct

**Marks :** 1/1

12. 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

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

**Answer**

HashMap

**Status :** Correct

**Marks :** 1/1

14. 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**

{Y=20, Z=30}

**Status :** Wrong

**Marks :** 0/1

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

**Answer**

firstKey()

**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.Objects;
import java.util.Scanner;
import java.util.Set;
```

```
class Vehicle {
    private String regNumber;
    private String ownerName;
```

```
private String vehicleType;

public Vehicle(String regNumber, String ownerName, String vehicleType) {
    this.regNumber = regNumber;
    this.ownerName = ownerName;
    this.vehicleType = vehicleType;
}

public String getRegNumber() {
    return regNumber;
}

public String getOwnerName() {
    return ownerName;
}

public String getVehicleType() {
    return vehicleType;
}

@Override
public boolean equals(Object o) {
    if (this == o) return true;
    if (!(o instanceof Vehicle)) return false;
    Vehicle vehicle = (Vehicle) o;
    return regNumber.equals(vehicle.regNumber);
}

@Override
public int hashCode() {
    return Objects.hash(regNumber);
}

@Override
public String toString() {
    return regNumber + " " + ownerName + " " + vehicleType;
}
}
```

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

```
if (!sc.hasNextInt()) return;  
n = sc.nextInt();  
Set<Vehicle> set = new HashSet<>();  
  
for (int i = 0; i < n; i++) {  
    if (!sc.hasNext()) break;  
    String reg = sc.next();  
    String owner = sc.next();  
    String type = sc.next();  
    Vehicle v = new Vehicle(reg, owner, type);  
    set.add(v);  
}  
for (Vehicle v : set) {  
    System.out.println(v);  
}  
sc.close();  
}  
}
```

**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.*;
```

```
public class Main{
```

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

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

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

```
        double total = 0;
```

```
        while (true) {
```

```
            String input = sc.nextLine().trim();
```

```
            if (input.equalsIgnoreCase("done"))
```

```
                break;
```

```
            if (!input.contains(":") || input.indexOf(':') != input.lastIndexOf(':')) {
```

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

```
                return;
```

```
            }
```

```
            String[] parts = input.split(":");
```

```
            if (parts.length != 2) {
```

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

```
                return;
```

```

    }

    String fruit = parts[0];
    String qtyStr = parts[1];

    if (!fruit.matches("[A-Za-z]+")) {
        System.out.println("Invalid format");
        return;
    }

    double qty;
    try {
        qty = Double.parseDouble(qtyStr);
    } catch (Exception e) {
        System.out.println("Invalid input");
        return;
    }

    map.put(fruit, qty);
}

for (double q : map.values())
    total += q;

System.out.printf("%.2f", total);
sc.close();
}
}

```

**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.*;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine().trim());
        TreeMap<Character, Integer> map = new TreeMap<>();
        for (int i = 0; i < n; i++) {
            String line = sc.nextLine();
            for (char ch : line.toCharArray()) {
```

```
        if (Character.isLetter(ch)) {  
            map.put(ch, map.getOrDefault(ch, 0) + 1);  
        }  
    }  
}  
System.out.println("Character Frequency:");  
for (Map.Entry<Character, Integer> e : map.entrySet()) {  
    System.out.println(e.getKey() + ": " + e.getValue());  
}  
sc.close();  
}  
}
```

**Status :** Correct

**Marks : 10/10**

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Scan to verify results



## 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.*;
```

```
public class Main {
```

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

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

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

```
        TreeSet<Integer> seats = new TreeSet<>();
```

```
        for (int i = 0; i < n; i++) {
```

```
            seats.add(sc.nextInt());
```

```
        }
```

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

```
        if (seats.contains(m))
```

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

```
        else
```

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

```
        sc.close();
```

```
    }
```

```
}
```

**Status : Correct**

**Marks : 10/10**

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Scan to verify results



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

### REC\_2028\_OOPS using Java\_Week 11

Attempt : 1  
Total Mark : 20  
Marks Obtained : 10

#### Section 1 : Project

##### 1. Problem Statement

In ABC Corporation, employee records are stored in a database.

To efficiently manage employee details using Java and JDBC, you are tasked with building an Employee Management System that supports the following functionalities:

Adding a new employee

Updating an employee's salary

Viewing an employee's details

Displaying all employees

You are given two files:

### File 1: Employee.java (POJO Class)

This class represents the Employee entity.

An Employee contains the following details:

Field Description

employeeId Unique Employee ID (Integer)

name Employee Name (String)

department Employee Department (String)

salary Employee Salary (Double)

Students must write code in the marked area:

```
class Employee {  
    private int employeeId;  
    private String name;  
    private String department;  
    private double salary;  
  
    public Employee() {}  
  
    public Employee(int employeeId, String name, String department, double salary) {  
        // write your code here  
    }  
  
    // Include getters and setters  
}
```

Expected in this part:

Assign parameter values to instance variables inside the constructor.

Add getters and setters for all attributes.

File 2: EmployeeDAO.java (Data Access Layer)

This class handles all database operations using JDBC.

Students must complete the missing JDBC logic in the following methods:

```
class EmployeeDAO {  
  
    public void addEmployee(Connection conn, Employee employee) throws  
    SQLException {  
        // write your code here  
    }  
  
    public void updateSalary(Connection conn, int employeeId, double  
    newSalary) throws SQLException {  
        // write your code here  
    }  
  
    public void deleteEmployee(Connection conn, int employeeId) throws  
    SQLException {  
        // write your code here  
    }  
  
    public Employee viewEmployeeRecord(Connection conn, int employeeId)  
    throws SQLException {  
        // write your code here  
    }  
  
    public List<Employee> displayAllEmployees(Connection conn) throws  
    SQLException {  
        // write your code here  
    }  
}
```

```
private Employee mapToEmployee(ResultSet rs) throws SQLException {  
    return new Employee(  
        // write your code here  
    );  
}  
}
```

Expected in this part:

Write SQL queries for INSERT, UPDATE, DELETE, SELECT.

Execute queries using PreparedStatement or Statement.

Map ResultSet rows to Employee objects using mapToEmployee().

Return a List<Employee> where required.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri\_dbUsername: testPassword: test123

The employees table has already been created with the following structure:

### ***Input Format***

The first line of input consists of an integer choice, representing the operation to be performed:

(1 for Add Employee, 2 for Update Salary, 3 for View Employee Record, 4 for Display All Employees, 5 for Exit)

For choice 1 (Add Employee):

1. The second line consists of an integer employee\_id.
2. The third line consists of a string name.
3. The fourth line consists of a string department.
4. The fifth line consists of a double salary (must be at least 30000).



For choice 2 (Update Salary):

1. The second line consists of an integer `employee_id`.
2. The third line consists of a double `new_salary` (must be at least 30000).

For choice 3 (View Employee Record):

1. The second line consists of an integer `employee_id`.

For choice 4 (Display All Employees).

For choice 5 (Exit).

### **Output Format**

For choice 1 (Add Employee),

1. Print "Employee added successfully" if the employee was added.

For choice 2 (Update Salary),

1. Print "Salary updated successfully" if the salary update was successful.
2. Print "Employee not found." if the specified employee ID does not exist.
3. Print "Salary must be at least 30000." if the provided salary is below the minimum.

For choice 3 (View Employee Record),

1. Display the employee details in the format:
2. ID: `[employee_id]` | Name: `[name]` | Department: `[department]` | Salary: `[salary]`
3. Print "Employee not found." if the specified employee ID does not exist.

For choice 4 (Display All Employees),

1. Display each employee on a new line in the format:
2. ID | Name | Department | Salary

For choice 5 (Exit),

1. Print "Exiting Employee Management System."

For invalid input:

1. Print "Invalid choice. Please try again."

### **Sample Test Case**

Input: 1

101

Alice Johnson

Engineering

31000.75

4

6

5

Output: Employee added successfully

ID | Name | Department | Salary

101 | Alice Johnson | Engineering | 31000.75

Invalid choice. Please try again.

Exiting Employee Management System.

### **Answer**

```
import java.sql.*;
```

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

```
import java.sql.*;
```

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

```
class Employee {
```

```
    private int employeeId;
```

```
    private String name;
```

```
private String department;
private double salary;

// Constructor
public Employee(int employeeId, String name, String department, double
salary) {
    this.employeeId = employeeId;
    this.name = name;
    this.department = department;
    this.salary = salary;
}

// Getters and Setters
public int getEmployeeId() { return employeeId; }
public void setEmployeeId(int employeeId) { this.employeeId = employeeId; }

public String getName() { return name; }
public void setName(String name) { this.name = name; }

public String getDepartment() { return department; }
public void setDepartment(String department) { this.department =
department; }

public double getSalary() { return salary; }
public void setSalary(double salary) { this.salary = salary; }
}

public class EmployeeManagementSystem {

    // Add Employee
    public static void addEmployee(Connection conn, Scanner scanner) {
        int employeeId = scanner.nextInt();
        scanner.nextLine(); // Consume newline
        String name = scanner.nextLine();
        String department = scanner.nextLine();
        double salary = scanner.nextDouble();

        if (salary < 30000) {
            System.out.println("Salary must be at least 30000.");
            return;
        }
    }
}
```

```

// Create an Employee POJO object
Employee employee = new Employee(employeeId, name, department,
salary);

String insertQuery = "INSERT INTO employees (employee_id, name,
department, salary) VALUES (?, ?, ?, ?)";
try (PreparedStatement stmt = conn.prepareStatement(insertQuery)) {
    stmt.setInt(1, employee.getEmployeeId());
    stmt.setString(2, employee.getName());
    stmt.setString(3, employee.getDepartment());
    stmt.setDouble(4, employee.getSalary());

    int rowsInserted = stmt.executeUpdate();
    System.out.println(rowsInserted > 0 ? "Employee added successfully." :
"Failed to add employee.");
} catch (SQLException e) {
    System.out.println("Error adding employee: " + e.getMessage());
}
}

```

```

// Update Salary
public static void updateSalary(Connection conn, Scanner scanner) {
    int employeeId = scanner.nextInt();
    double newSalary = scanner.nextDouble();

    if (newSalary < 30000) {
        System.out.println("Salary must be at least 30000.");
        return;
    }

    String updateQuery = "UPDATE employees SET salary = ? WHERE
employee_id = ?";
    try (PreparedStatement stmt = conn.prepareStatement(updateQuery)) {
        stmt.setDouble(1, newSalary);
        stmt.setInt(2, employeeId);

        int rowsUpdated = stmt.executeUpdate();
        System.out.println(rowsUpdated > 0 ? "Salary updated successfully" :
"Employee not found.");
    } catch (SQLException e) {
        System.out.println("Error updating salary: " + e.getMessage());
    }
}

```

```

    }
    // View Employee Record
    public static void viewEmployeeRecord(Connection conn, Scanner scanner) {
        int employeeId = scanner.nextInt();
        String selectQuery = "SELECT * FROM employees WHERE employee_id = ?";

        try (PreparedStatement stmt = conn.prepareStatement(selectQuery)) {
            stmt.setInt(1, employeeId);
            ResultSet rs = stmt.executeQuery();

            if (rs.next()) {
                Employee employee = new Employee(
                    rs.getInt("employee_id"),
                    rs.getString("name"),
                    rs.getString("department"),
                    rs.getDouble("salary")
                );
                System.out.printf("Id: %d Name: %s Department: %s Salary: %.2f\n",
                    employee.getEmployeeId(), employee.getName(),
                    employee.getDepartment(), employee.getSalary());
            } else {
                System.out.println("Employee not found.");
            }
        } catch (SQLException e) {
            System.out.println("Error retrieving employee record: " + e.getMessage());
        }
    }
}

```

```

// Display All Employees
public static void displayAllEmployees(Connection conn) {
    String displayQuery = "SELECT * FROM employees";
    try (Statement stmt = conn.createStatement();
        ResultSet rs = stmt.executeQuery(displayQuery)) {

        System.out.println("ID | Name | Department | Salary");
        while (rs.next()) {
            Employee employee = new Employee(
                rs.getInt("employee_id"),
                rs.getString("name"),
                rs.getString("department"),
                rs.getDouble("salary")
            );
        }
    }
}

```

```

    );
    System.out.printf("%d | %s | %s | %.2f\n",
        employee.getEmployeeId(),
        employee.getName(),
        employee.getDepartment(),
        employee.getSalary()
    );
}
} catch (SQLException e) {
    System.out.println("Error displaying employees: " + e.getMessage());
}
}

// Main method for testing (optional)
public static void main(String[] args) {
    try (Connection conn = DriverManager.getConnection("jdbc:mysql://
localhost:3306/your_db", "username", "password");
        Scanner scanner = new Scanner(System.in)) {

        // Example usage
        addEmployee(conn, scanner);
        updateSalary(conn, scanner);
        viewEmployeeRecord(conn, scanner);
        displayAllEmployees(conn);

    } catch (SQLException e) {
        System.out.println("Database connection error: " + e.getMessage());
    }
}
}

```

```

public static void main(String[] args) {
    String url = "jdbc:mysql://localhost/ri_db";
    String username = "test";
    String password = "test123";

    try (Connection conn = DriverManager.getConnection(url, username,
password);
        Scanner scanner = new Scanner(System.in)) {

```

```

int choice;
do {
    choice = scanner.nextInt();

    switch (choice) {
        case 1 -> addEmployee(conn, scanner);
        case 2 -> updateSalary(conn, scanner);
        case 3 -> viewEmployeeRecord(conn, scanner);
        case 4 -> displayAllEmployees(conn);
        case 5 -> System.out.println("Exiting Employee Management
System.");
        default -> System.out.println("Invalid choice. Please try again.");
    }

    } while (choice != 5);

    } catch (SQLException e) {
        System.out.println("Database Error: " + e.getMessage());
    }
}
}

```

**Status : Wrong**

**Marks : 0/10**

## 2. Problem Statement

Create a JDBC-based Inventory Management System that handles runtime input to manage items in an inventory. The system should allow users to:

Add a new item (item ID, name, quantity, price).

Restock an item by increasing its quantity.

Reduce the stock of an item, ensuring sufficient quantity.

Display all items in the inventory in a sorted order by item ID.

Exit the application.

Half of the code is given here; Only the remaining part should be completed.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri\_db

USER: test

PWD: test123

The items table has already been created with the following structure:

Table Name: items

### ***Input Format***

The first line of input consists of an integer choice, representing the operation to be performed (1 for Add Item, 2 for Restock item, 3 for reduce item, 4 for Display, 5 for Exit).

For choice 1 (Add Item):

- The second line consists of an integer item\_id.
- The third line consists of a string name.
- The fourth line consists of an integer quantity.
- The fifth line consists of a double price.

For choice 2 (Restock Item):

- The second line consists of an integer item\_id.
- The third line consists of an integer quantity\_to\_add (must be positive).

For choice 3 (Reduce Stock):

- The second line consists of an integer item\_id.
- The third line consists of an integer quantity\_to\_remove (must be positive).

For choice 4 (Display Inventory):

- No additional inputs are required.



For choice 5 (Exit):

- No additional inputs are required.

### ***Output Format***

For choice 1 (Add Item):

- Print "Item added successfully" if the item was added.
- Print "Failed to add item." if the insertion failed.

For choice 2 (Restock Item):

- Print "Item restocked successfully" if the restock was successful.
- Print "Item not found." if the specified item ID does not exist.

For choice 3 (Reduce Stock):

- Print "Stock reduced successfully" if the stock reduction was successful.
- Print "Not enough stock to remove." if there is insufficient quantity.
- Print "Item not found." if the specified item ID does not exist.

For choice 4 (Display Inventory):

- Display each item on a new line in the format:
- ID | Name | Quantity | Price
- If no items are available, print nothing (or handle with an appropriate message if desired).

For choice 5 (Exit):

- Print "Exiting Inventory Management System."

For invalid input:

- Print "Invalid choice. Please try again."

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

Input: 1

101

Laptop

50

1200.00

4

5

Output: Item added successfully

ID | Name | Quantity | Price

101 | Laptop | 50 | 1200.00

Exiting Inventory Management System.

### **Answer**

```
import java.sql.*;
```

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

```
class InventoryManagementSystem {
```

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

```
        try (Connection conn = DriverManager.getConnection("jdbc:mysql://localhost/ri_db", "test", "test123");
```

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

```
            boolean running = true;
```

```
            while (running) {
```

```
                int choice = scanner.nextInt();
```

```
                switch (choice) {
```

```
                    case 1:
```

```
                        addItem(conn, scanner);
```

```
                        break;
```

```
                    case 2:
```

```
                        restockItem(conn, scanner);
```

```
                        break;
```

```
                    case 3:
```

```
                        reduceStock(conn, scanner);
```

```
                        break;
```

```
                    case 4:
```

```
                        displayInventory(conn);
```

```
                        break;
```

```
                    case 5:
```

```
                        System.out.println("Exiting Inventory Management System.");
```

```
                        running = false;
```

```
                        break;
```

```
                    default:
```

```

        System.out.println("Invalid choice. Please try again.");
    }
}
} catch (SQLException e) {
    e.printStackTrace();
}
}

// You are using Java
public static void addItem(Connection conn, Scanner scanner) {
    // write your code here
    try {
        int id = scanner.nextInt();
        String name = scanner.next();
        int qty = scanner.nextInt();
        double price = scanner.nextDouble();

        String sql = "INSERT INTO items (item_id, name, quantity, price) VALUES
        (?, ?, ?, ?)";
        PreparedStatement ps = conn.prepareStatement(sql);
        ps.setInt(1, id);
        ps.setString(2, name);
        ps.setInt(3, qty);
        ps.setDouble(4, price);

        int rows = ps.executeUpdate();
        if (rows > 0) {
            System.out.println("Item added successfully");
        } else {
            System.out.println("Failed to add item.");
        }

    } catch (SQLException e) {
        System.out.println("Failed to add item.");
    }
}

public static void restockItem(Connection conn, Scanner scanner) {
    // write your code here
    try {
        int id = scanner.nextInt();
        int addQty = scanner.nextInt();
    }
}

```

```

        if (addQty <= 0) {
            System.out.println("Invalid quantity.");
            return;
        }

        String check = "SELECT quantity FROM items WHERE item_id = ?";
        PreparedStatement psCheck = conn.prepareStatement(check);
        psCheck.setInt(1, id);
        ResultSet rs = psCheck.executeQuery();

        if (rs.next()) {
            int newQty = rs.getInt("quantity") + addQty;
            String update = "UPDATE items SET quantity = ? WHERE item_id = ?";
            PreparedStatement psUpdate = conn.prepareStatement(update);
            psUpdate.setInt(1, newQty);
            psUpdate.setInt(2, id);
            psUpdate.executeUpdate();
            System.out.println("Item restocked successfully");
        } else {
            System.out.println("Item not found.");
        }

    } catch (SQLException e) {
        System.out.println("Error in restocking item.");
    }
}

public static void reduceStock(Connection conn, Scanner scanner) {
    // write your code here
    try {
        int id = scanner.nextInt();
        int removeQty = scanner.nextInt();

        if (removeQty <= 0) {
            System.out.println("Invalid quantity.");
            return;
        }

        String check = "SELECT quantity FROM items WHERE item_id = ?";
        PreparedStatement psCheck = conn.prepareStatement(check);
        psCheck.setInt(1, id);
        ResultSet rs = psCheck.executeQuery();
    }
}

```

```

        if (rs.next()) {
            int currQty = rs.getInt("quantity");
            if (currQty >= removeQty) {
                int newQty = currQty - removeQty;
                String update = "UPDATE items SET quantity = ? WHERE item_id = ?";
                PreparedStatement psUpdate = conn.prepareStatement(update);
                psUpdate.setInt(1, newQty);
                psUpdate.setInt(2, id);
                psUpdate.executeUpdate();
                System.out.println("Stock reduced successfully");
            } else {
                System.out.println("Not enough stock to remove.");
            }
        } else {
            System.out.println("Item not found.");
        }
    } catch (SQLException e) {
        System.out.println("Error reducing stock.");
    }
}

```

```

public static void displayInventory(Connection conn) {
    // write your code here
    try {
        String sql = "SELECT * FROM items ORDER BY item_id";
        PreparedStatement ps = conn.prepareStatement(sql);
        ResultSet rs = ps.executeQuery();
        boolean hasData = false;

        while (rs.next()) {
            if (!hasData) {
                System.out.println("ID | Name | Quantity | Price");
                hasData = true;
            }
            int id = rs.getInt("item_id");
            String name = rs.getString("name");
            int qty = rs.getInt("quantity");
            double price = rs.getDouble("price");
            System.out.printf("%d | %s | %d | %.2f%n", id, name, qty, price);
        }
    }
}

```

```
    } catch (SQLException e) {  
        System.out.println("Error displaying inventory.");  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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Scan to verify results



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

### REC\_Week 12\_Java\_Lamba Expressions\_MCQ

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : MCQ

1. Which of the following is a valid lambda expression in Java?

**Answer**

All of the mentioned options

**Status : Correct**

**Marks : 1/1**

2. Which functional interface is commonly used with lambda expressions in Java?

**Answer**

Runnable

**Status : Correct**

**Marks : 1/1**

3. Can a lambda expression have more than one parameter?

**Answer**

Yes, it can have multiple parameters

**Status : Correct**

**Marks : 1/1**

4. What is the syntax for a basic lambda expression in Java?

**Answer**

(parameters) -> expression

**Status : Correct**

**Marks : 1/1**

5. What is the return type of a lambda expression in Java?

**Answer**

The return type is inferred from the context

**Status : Correct**

**Marks : 1/1**

6. Can a lambda expression in Java have a body with multiple statements?

**Answer**

Yes, if the statements are enclosed in curly braces

**Status : Correct**

**Marks : 1/1**

7. Which of the following interfaces is NOT a functional interface in Java?

**Answer**

Iterable

**Status : Correct**

**Marks : 1/1**

8. Which functional interface in Java takes two arguments and returns a



result?

**Answer**

BiFunction

**Status : Correct**

**Marks : 1/1**

9. What is a lambda expression in Java?

**Answer**

A way to define anonymous methods

**Status : Correct**

**Marks : 1/1**

10. Can a lambda expression in Java have a body with multiple statements?

**Answer**

Yes, if the statements are enclosed in curly braces

**Status : Correct**

**Marks : 1/1**

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

### 2028\_REC\_OOPS using Java\_Week 12\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Sabrina is working on a project that involves analyzing a set of numbers. In her exploration, she encounters scenarios where extracting even numbers and finding their sum is essential.

Create a program that calculates the sum of even numbers from a given array of integers using a lambda expression.

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

The first line of input consists of an integer N, representing the size of the array.

The second line consists of N space-separated integers, representing the elements of the array.

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

The output prints the sum of the even integers from the array.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3

29 37 45

Output: 0

### **Answer**

// You are using Java

import java.util.\*;

import java.util.stream.\*;

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

```
        int N = sc.nextInt();  
        int[] arr = new int[N];
```

```
        for(int i = 0; i < N; i++) {  
            arr[i] = sc.nextInt();  
        }
```

```
        int sum = Arrays.stream(arr)  
            .filter(x -> x % 2 == 0)  
            .sum();
```

```
        System.out.println(sum);  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

# Rajalakshmi Engineering College

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Scan to verify results



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

### 2028\_REC\_OOPS using Java\_Week 12\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Alex is learning about Java's functional interfaces and lambda expressions.

He wants to write a simple program that prints the square of each number in an array using a predefined functional interface.

Help Alex complete this task using the Consumer functional interface.

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

- The first line contains an integer N, the number of elements in the array.
- The second line contains N space-separated integers.

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

- Print the squares of all elements in the array, separated by a space.

Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: 4

1 2 3 4

Output: 1 4 9 16

**Answer**

// You are using Java

import java.util.\*;

import java.util.function.\*;

```
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        int N = sc.nextInt();  
        int[] arr = new int[N];  
        for(int i = 0; i < N; i++)  
            arr[i] = sc.nextInt();
```

```
        Consumer<Integer> square = x -> System.out.print((x * x) + " ");
```

```
        for(int x : arr)  
            square.accept(x);  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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Scan to verify results



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

### 2028\_REC\_OOPS using Java\_Week 12\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

In the mystical realm of programming, there exists a magical incantation to reveal hidden words.

Elara, the skilled enchantress, wishes to summon a word using her spell and then reverse its characters to uncover its enchanted reflection.

Write a program that uses the predefined functional interface `Supplier<String>` and a lambda expression to:

Supply (generate) a string, and

Display its reversed form.

**Input Format**

No input is required from the user.

The string must be supplied internally using a Supplier<String>.

**Output Format**

Print the reversed version of the supplied string.

Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: Wizard!!

Output: !!draziW

**Answer**

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

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String in = sc.nextLine();
        Supplier<String> sup = () -> in;
        String s = sup.get();
        String r = new StringBuilder(s).reverse().toString();
        System.out.println(r);
    }
}
```

**Status :** Correct

**Marks :** 10/10

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Scan to verify results



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

### 2028\_REC\_OOPS using Java\_Week 12\_Q4

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Abi is working on a text analysis project where she needs to categorize words based on their length.

Words that have three or fewer characters are considered "Short", while words with more than three characters are classified as "Long."

Write a Java program that takes a sentence as input, analyzes each word, and prints a list showing whether each word is "Short" or "Long."

Use the predefined functional interface `Function<String, String>` along with a lambda expression for categorization.

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



A single line containing a sentence (words separated by spaces).

**Output Format**

- A single line with each word categorized as "Short" or "Long", separated by spaces.

Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: I love my cat

Output: Short Long Short Short

**Answer**

```
// You are using Java
import java.util.*;
import java.util.function.*;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String sentence = sc.nextLine();
        String[] words = sentence.split(" ");
```

```
        Function<String,String> categorize = w -> w.length() <= 3 ? "Short" : "Long";
```

```
        for(String w : words)
            System.out.print(categorize.apply(w) + " ");
    }
}
```

**Status :** Correct

**Marks :** 10/10