

# Rajalakshmi Engineering College

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Batch: 2028  
Degree: B.E - AI & DS

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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 wants help with their doubt. Each handouts an integer and wants to find if one Integer 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**

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Read two integers from the user
        int num1 = scanner.nextInt();
        int num2 = scanner.nextInt();

        // Check the condition:
        // One integer is positive AND the other is NOT divisible by 3
        boolean condition1 = (num1 > 0 && num2 % 3 != 0);
        boolean condition2 = (num2 > 0 && num1 % 3 != 0);

        if (condition1 || condition2) {
            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 : 2  
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***

```
import java.util.Scanner;

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

        // Read the integer input
        int amount = scanner.nextInt();

        // Convert to double
        double converted = (double) amount;

        // Display the result in the specified format
        System.out.println("Original Integer: " + amount + " Converted Double: " +
                           converted);

        scanner.close();
    }
}
```

***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.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();
        int sum = a + b;
        int product = a * b;
        if (sum % product == 0) {
            System.out.println("Sum is Multiple of Product");
        } else {
            System.out.println("Sum is Not Multiple of Product");
        }
        scanner.close();
    }
}
```

**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***

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        double radius = scanner.nextDouble();
        double pi = 3.14159;
        double circumference = 2 * pi * radius;
```

```
        double area = pi * radius * radius;  
        System.out.printf("Circumference: %.2f meters\n", circumference);  
        System.out.printf("Area: %.2f square meters\n", area);  
    }  
}
```

**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**

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int X = scanner.nextInt();
        int N = scanner.nextInt();
        int mask = (1 << N) - 1;
        int result = X & mask;
        System.out.println("Result: " + result);
    }
}
```

**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***

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int input1 = scanner.nextInt();
        int input2 = scanner.nextInt();
        boolean condition1 = (input1 <= 0) && (input1 % 2 != 0);
        boolean condition2 = (input2 <= 0) && (input2 % 2 != 0);
        boolean result = condition1 || condition2;
        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 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***

```
import java.util.Scanner;
import java.text.DecimalFormat;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int a = scanner.nextInt();
        int b = scanner.nextInt();
        int c = scanner.nextInt();
        double average = (a + b + c) / 3.0;
        DecimalFormat df = new DecimalFormat("0.00");
        String avgFormatted = df.format(average);
        int smallest = Math.min(a, Math.min(b, c));
        int middle = (a + b + c) - Math.max(a, Math.max(b, c)) - smallest;
```

```
        String result = (average > smallest && average > middle)
            ? "Average is greater than both " + smallest + " and " + middle
            : "Average is not greater than two smallest expenses";
        System.out.println(avgFormatted + " " + result);
    }
}
```

**Status :** Partially correct

**Marks :** 5/10

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

### REC\_2028\_OOPS using Java\_Week 9\_PAH

Attempt : 1  
Total Mark : 30  
Marks Obtained : 30

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

##### **1. Problem Statement**

Rekha is a teacher who wants to calculate the average of marks scored by her students in a test. She needs to store all the marks dynamically because the number of students may vary each time. Using an ArrayList allows her to easily add any number of marks without worrying about the initial size.

Help her implement the task.

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

The first line of input is an integer n, representing the number of students..

The second line of input consists of n double values, representing the marks of each student, separated by a space.

### **Output Format**

The output prints: "Average of the list: " followed by the average value formatted to two decimal places.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 5  
1.0 2.0 3.0 4.0 5.0

Output: Average of the list: 3.00

### **Answer**

```
import java.util.*;  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        int n = sc.nextInt(); // number of students  
        ArrayList<Double> marks = new ArrayList<>();  
  
        for (int i = 0; i < n; i++) {  
            marks.add(sc.nextDouble());  
        }  
  
        double sum = 0;  
        for (double m : marks) {  
            sum += m;  
        }  
  
        double avg = sum / n;  
  
        System.out.printf("Average of the list: %.2f", avg);  
    }  
}
```

Status : Correct

Marks : 10/10

## 2. Problem Statement

Arun is building a task manager to keep track of tasks using a `LinkedList`.  
The task manager supports the following operations:

"ADD <task>" Adds the given task to the end of the list.  
"REMOVE" Removes the first task from the list.  
"SHOW" Displays all tasks in the list in order. If the list is empty, print "EMPTY".

Help Arun implement this functionality using a `LinkedList`.

### ***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 <task>"
- "REMOVE"
- "SHOW"

### ***Output Format***

For each "SHOW" command, the output prints the tasks in order, separated by spaces.

If no tasks exist, print "EMPTY".

Refer to the sample output for formatting specifications.

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

Input: 5  
ADD homework  
ADD project  
SHOW  
REMOVE  
SHOW  
Output: homework project  
project

## Answer

```
import java.util.*;  
  
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        int n = sc.nextInt();  
        sc.nextLine(); // consume leftover newline  
  
        LinkedList<String> tasks = new LinkedList<>();  
  
        for (int i = 0; i < n; i++) {  
            String command = sc.nextLine().trim();  
  
            if (command.startsWith("ADD")) {  
                String task = command.substring(4); // extract task name  
                tasks.add(task);  
            } else if (command.equals("REMOVE")) {  
                if (!tasks.isEmpty()) {  
                    tasks.removeFirst();  
                }  
            } else if (command.equals("SHOW")) {  
                if (tasks.isEmpty()) {  
                    System.out.println("EMPTY");  
                } else {  
                    for (String t : tasks) {  
                        System.out.print(t + " ");  
                    }  
                    System.out.println();  
                }  
            }  
        }  
    }  
}
```

Status : Correct

Marks : 10/10

### 3. Problem Statement

Aditi is analyzing stock market trends and wants to find the Next Greater Element (NGE) for each stock price in a list. The Next Greater Element for an element  $x$  in an array is the first element to the right that is greater than  $x$ . If no greater element exists, return -1 for that position.

Your task is to help Aditi by efficiently computing the Next Greater Element for each element in the given array using a Stack.

**Example:**

**Input:**

6  
4 5 2 10 8 6

**Output:**

5 10 10 -1 -1 -1

**Explanation:**

For each element:

4 5 (next greater element) 5 10 2 10 10 -1 (No greater element) 8 -16 -1

***Input Format***

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

The second line contains  $n$  space-separated integers  $\text{arr}[i]$ , where  $\text{arr}[i]$  is the stock price on the  $i$ -th day.

***Output Format***

The output prints  $n$  space-separated integers representing the Next Greater Element for each element in the array.

Refer to the sample output for formatting specifications.

***Sample Test Case***

Input: 6  
4 5 2 10 8 6

Output: 5 10 10 -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 n = sc.nextInt();
        int[] arr = new int[n];
        int[] nge = new int[n];

        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }

        Stack<Integer> stack = new Stack<>();

        // Traverse from right to left
        for (int i = n - 1; i >= 0; i--) {

            // Remove all elements <= current
            while (!stack.isEmpty() && stack.peek() <= arr[i]) {
                stack.pop();
            }

            // If stack empty no greater element exists
            if (stack.isEmpty()) {
                nge[i] = -1;
            } else {
                nge[i] = stack.peek();
            }

            // Push current element to stack
            stack.push(arr[i]);
        }

        // Print output
        for (int i = 0; i < n; i++) {
            System.out.print(nge[i] + " ");
        }
    }
}
```

```
        for (int i = 0; i < n; i++) {  
            System.out.print(nge[i] + " ");  
        }  
    }  
}
```

**Status :** Correct

**Marks :** 10/10

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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***

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int S1 = scanner.nextInt();
        int S2 = scanner.nextInt();
        int S3 = scanner.nextInt();
        boolean isMidpoint = (S2 * 2) == (S1 + S3);
        System.out.println(isMidpoint);
        if (isMidpoint) {
            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 tasks 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***

```
public class Main{  
    public static void calculateWork(int x, int y, int z, int d1, int d2) {  
        double aPerDay = 1.0 / x;  
        double bPerDay = 1.0 / y;  
        double cPerDay = 1.0 / z;  
        double work1 = d1 * (aPerDay + bPerDay + cPerDay);  
        double work2 = d2 * (aPerDay + bPerDay);  
        double remainingWork = 1.0 - (work1 + work2);  
        remainingWork = Math.max(0, remainingWork);  
        System.out.printf("Work done in first d1 days (A+B+C): %.2f%n", work1);  
        System.out.printf("Work done in next d2 days (A+B): %.2f%n", work2);  
        System.out.printf("Remaining work: %.2f%n", remainingWork);  
    }  
    public static void main(String[] args) {  
        java.util.Scanner scanner = new java.util.Scanner(System.in);  
        int x = scanner.nextInt();  
        int y = scanner.nextInt();  
        int z = scanner.nextInt();  
        int d1 = scanner.nextInt();  
        int d2 = scanner.nextInt();  
  
        calculateWork(x, y, z, d1, d2);  
    }  
}
```

**Status :** Correct

**Marks :** 10/10