**MANAV RACHNA UNIVERSITY, FARIDABAD**

**Department of Computer Science and Technology**

**Course: B.Tech. CSE Semester: III**

**Subject: Object Oriented Programming using Java (CSH201B-T&P)**

***Lab: 03*** *Control Structures and Arrays in Java*

***Objective:*** *Problems on Control Structures and Arrays in Java.*

***Course Outcomes:***

**CSH201B.1:** To impart **understanding** of basic programming concepts in Java language.

***Blooms Taxonomy Level****: BT1, BT2, BT3*

1. Write a Java program to calculate the average value of array elements.

public class AverageValueOfArray {

public static void main(String[] args) {

int[] numbers = { 5, 10, 15, 20, 25 };

double sum = 0.0;

for(int i = 0; i < numbers.length; i++) {

sum += numbers[i];

}

double average = sum / numbers.length;

System.out.println("The average value of the array elements is " + average);

}

}

1. Write a Java program to find the maximum and minimum value of an array.

public class MaxMinArray {

public static void main(String[] args) {

int[] arr = {10, 20, 30, 40, 50};

int max = arr[0];

int min = arr[0];

for(int i=1; i<arr.length; i++) {

if(arr[i] > max) {

max = arr[i];

}

else if(arr[i] < min) {

min = arr[i];

}

}

System.out.println("Maximum value in the array: " + max);

System.out.println("Minimum value in the array: " + min);

}

}

1. Write a Java program to find the duplicate values of an array of string values.

public class DuplicateStrings {

public static void main(String[] args) {

String[] arr = {"apple", "banana", "orange", "banana", "kiwi", "apple"};

for(int i=0; i<arr.length-1; i++) {

for(int j=i+1; j<arr.length; j++) {

if(arr[i].equals(arr[j])) {

System.out.println("Duplicate value found: " + arr[i]);

}

}

}

}

}

1. Write a Java program to add two matrices of the same size.

public class Box {

private double width;

private double height;

private double depth;

public Box(double width, double height, double depth) {

this.width = width;

this.height = height;

this.depth = depth;

}

public double volume() {

return width \* height \* depth;

}

}

public class TestBox {

public static void main(String[] args) {

Box box1 = new Box(10, 20, 30);

System.out.println("Volume of Box 1: " + box1.volume());

Box box2 = new Box(5, 8, 9);

System.out.println("Volume of Box 2: " + box2.volume());

}

}