Name: Pallavi Chaudhary

Student Code: AF0316472

Batch code: ANP-C6008

Lab Assignment 8

1. Write a Java program that demonstrates various operations on a 3D array:

a. Initializing the 3D array with random values.

b. Finding the maximum value in the array.

c. Calculating the average of all elements.

d. Displaying the array.

Code: -

```
/*1. Write a Java program that demonstrates various operations on a 3D array:

a. Initializing the 3D array with random values.

b. Finding the maximum value in the array.

c. Calculating the average of all elements.

d. Displaying the array. */


package Assignement_8;


import java.util.Scanner;


public class Program_1 {


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

```
		Scanner S = new Scanner(System.in);
//Task a is being completed
		// a. Initializing the 3D array with random values.
		int[][][] a = new int[3][4][5]; // Initializing Array
		// Using nested for loop for initializing values to each index of an array
		for (int i = 0; i < 3; i++) {
			for (int j = 0; j < 4; j++) {
				for (int k = 0; k < 5; k++) {
					a[i][j][k] = (int) (Math.random() * 10);
				}
			}
		}

	System.out.println("========================================
==========================");
//Task b is being achieved
		System.out.println("***************Printing the maximum
value*****************");
		// Printing the maximum value in an array
		int max = Integer.MIN_VALUE;
		for (int i = 0; i < 3; i++) {
			for (int j = 0; j < 4; j++) {
				for (int k = 0; k < 5; k++) {
					if (a[i][j][k] > max) {
						max = a[i][j][k];
```

```
                                        }

                                }

                        }

                }

                System.out.println("Maximum Value : " + max);

                // Task c is being achieved

//Calculating the Average of array

                int sum = 0;

                double avg = 0.0; // avg = average, initializing both equal to 0


        System.out.println("========================================
==========================");

                System.out.println("***************Printing the average of
array***********");

                for (int i = 0; i < 3; i++) {

                        for (int j = 0; j < 4; j++) {

                                for (int k = 0; k < 5; k++) {

                                        sum = sum + a[i][j][k]; // all the elements is being
added in the element sum

                                }

                        }

                }

                avg = sum / (3 * 4 * 5);

                System.out.println("Average : " + avg); // printing average
```

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


//Task d is being achieved

// d. Displaying the array.

                System.out.println("************Displaying 3D Array***************");

                for (int i = 0; i < 3; i++) {

                        for (int j = 0; j < 4; j++) {

                                for (int k = 0; k < 5; k++) {

                                        System.out.print(a[i][j][k]); // Displaying 3D array

                                }

                                System.out.print(" \n");

                        }

                        System.out.print(" \n");

                }

        }

}
```

Output: -

```
================================================================
****************Printing the maximum value******************
Maximum Value : 9
================================================================
****************Printing the average of array************
Average : 4.0
================================================================
*************Displaying 3D Array*****************
36742
02095
16693
03903

69710
43771
39483
72103

33596
15023
67017
99158
```

2. Write a Java program that performs addition of two matrices. The program should use a 2D array of wrapper class objects (e.g., Integer) for the matrix elements. Take two matrices as input, perform the addition operation, and display the resulting matrix.

Code: -

```java
//2. Write a Java program that performs addition of two
matrices.
//The program should use a 2D array of wrapper class objects
//(e.g., Integer) for the matrix elements. Take two matrices
as
//input, perform the addition operation, and display the
resulting matrix.
package Assignement_8;

import java.util.Scanner;

public class Program_2 {

	public static void main(String[] args) {
		Scanner S = new Scanner(System.in);
		int[][] a1 = new int[2][2]; // Initializing array a1
or matrix 1
		int[][] a2 = new int[2][2]; // Initializing array a2
or matrix 2
		int[][] sum = new int[2][2];
```

```
            // Matrix 1
            System.out.println("***************First
Matrix*****************");
            System.out.println("Enter the elements for matrix 1
: ");

            for (int i = 0; i < 2; i++) {// rows
                  for (int j = 0; j < 2; j++) {// columns
                        a1[i][j] = S.nextInt();  //take inputs for
matrix 1
                  }
            }
            for (int i = 0; i < 2; i++) {// rows
                  for (int j = 0; j < 2; j++) {// columns
                        System.out.print(a1[i][j] + " "); //print
matrix 1
                  }
                  System.out.println(); //space of line in rows

            }
            // Matrix 2
            System.out.println("***************Second
Matrix*****************");
            System.out.println("Enter the elements for Matrix 2
: ");

            for (int i = 0; i < 2; i++) { // rows
                  for (int j = 0; j < 2; j++) { // columns
                        a2[i][j] = S.nextInt(); //take inputs for
matrix 2
                  }
            }
            for (int i = 0; i < 2; i++) {// rows
                  for (int j = 0; j < 2; j++) { // columns
                        System.out.print(a2[i][j] + " "); //print
statements
                  }
                  System.out.println(); //will give one line
space in rows

            }
            // Sum of two Matrixes
            System.out.println("***************Sum of two
matrixes*******************");
            for (int i = 0; i < 2; i++) { // rows
                  for (int j = 0; j < 2; j++) { // columns
                        sum[i][j] = a1[i][j] + a2[i][j];
                  }
            }
            //for displaying the sum of two matrixes
            for (int i = 0; i < 2; i++) { // rows
```

```
                for (int j = 0; j < 2; j++) { // columns
                     System.out.print(sum[i][j] + " "); //print
the sum of 2 arrays
                }
                System.out.println(); //will give space in
lines
           }

     }

}
```

Output: -

```
Enter the elements for matrix 1 :
1
2
3
4
1 2
3 4
***************Second Matrix*****************
Enter the elements for Matrix 2 :
9
8
7
6
9 8
7 6
**************Sum of two matrixes******************
10 10
10 10
```

3. Write a program to receive array element, sort them by using your choice of sorting algorithm and display the elements.

Code: -

```
//3. Write a program to receive array element, sort them by
using your
//choice of sorting algorithm and display the elements.
package Assignement_8;

import java.util.Arrays; //importing array class for sorting
the array
import java.util.Scanner; //Scanner class for taking the input
from array
```

```
public class Program_3 { // public class

     public static void main(String[] args) { // calling main
method
          int[] a = new int[9]; // initializing an array of
size 9
          Scanner S = new Scanner(System.in); // creating
object for Scanner class
          System.out.println("Enter the elements : "); //
Printing Statement
          for (int i = 0; i < 9; i++) { // for loop
               a[i] = S.nextInt(); // taking input from the
user
          }
          System.out.println("****************Displaying
Array***********");
          Arrays.sort(a); // sorting array
          for (int i = 0; i < 9; i++) { // Using for loop for
displaying the array
               System.out.println(a[i]); // printing statement
for displaying array
          }

     }

}// closing the entire code
```

Output: -

```
Enter the elements :
10
20
30
40
90
80
70
60
50
****************Displaying Array***********
10
20
30
40
50
60
70
80
90
```