Lab set = 9

Assignment 01

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

Like a) Initialization

b) Display Elements

c) Find Max Value

d) Calculate Average Values

Source code

```java
package anudip.java.lab;

public class ThreeDArrayOperations {

    public static void main(String[] args) {
        // a) Initialization of a 3D array
        int[][][] arr = {
            {
                {14, 12, 33},
                {44, 54, 69}
            },
            {
                {78, 48, 29},
                {15, 71, 26}
            },
            {
                {17, 44, 95},
                {23, 16, 48}
            }
        };

        // b) Display Elements
        System.out.println("Elements of the 3D array:");
        for (int i = 0; i < arr.length; i++) {
            for (int j = 0; j < arr[i].length; j++) {
                for (int k = 0; k < arr[i][j].length; k++) {
                    System.out.print(arr[i][j][k] + " ");
                }
                System.out.println();
            }
            System.out.println();
        }

```

```java
        // c) Find Max Value
        int max = arr[0][0][0];
        for (int i = 0; i < arr.length; i++) {
            for (int j = 0; j < arr[i].length; j++) {
                for (int k = 0; k < arr[i][j].length; k++) {
                    if (arr[i][j][k] > max) {
                        max = arr[i][j][k];
                    }
                }
            }
        }
        System.out.println("Maximum value in the 3D array: " + max);

        // d) Calculate Average Values
        int sum = 0;
        int count = 0;
        for (int i = 0; i < arr.length; i++) {
            for (int j = 0; j < arr[i].length; j++) {
                for (int k = 0; k < arr[i][j].length; k++) {
                    sum += arr[i][j][k];
                    count++;
                }
            }
        }
        double average = (double) sum / count;
        System.out.println("Average value of elements in the 3D array: " + average);
    }
}
```

Output

```
<terminated> ThreeDArrayOperations [Java Application] C:\Users\Preetham\.p2\pool\pl
Elements of the 3D array:
14 12 33
44 54 69

78 48 29
15 71 26

17 44 95
23 16 48

Maximum value in the 3D array: 95
Average value of elements in the 3D array: 40.888888888888886
```

Assignment 02

Write a Java program that performs addition of two matrices using user input using Wrapper Class.

Source code

```java
package anudip.java.lab;

import java.util.Scanner;

public class Matrix{

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

        System.out.println("Enter number of rows:");
        Integer rows = Integer.valueOf(sc.nextLine());
        System.out.println("Enter number of columns:");
        Integer cols = Integer.valueOf(sc.nextLine());

        Integer[][] matrix1 = new Integer[rows][cols];
        Integer[][] matrix2 = new Integer[rows][cols];
        Integer[][] result = new Integer[rows][cols];

        System.out.println("Enter elements for first matrix:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                matrix1[i][j] = Integer.valueOf(sc.nextLine());
            }
        }

        System.out.println("Enter elements for second matrix:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                matrix2[i][j] = Integer.valueOf(sc.nextLine());
            }
        }

        // Adding two matrices
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                result[i][j] = matrix1[i][j] + matrix2[i][j];
            }
        }

        System.out.println("Sum of the matrices:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                System.out.print(result[i][j] + " ");
            }
            System.out.println();
        }

        sc.close();
    }
}
```

Output

```
<terminated> Matrix [Java Application] C:\Users\Preetham\.
Enter number of rows:
3
Enter number of columns:
3
Enter elements for first matrix:
1
2
54
64
78
45
35
54
45
Enter elements for second matrix:
65
45
45
98
75
12
23
56
85
Sum of the matrices:
66 47 99
162 153 57
58 110 130
```