

Lab Report-5

Course Title :Data Structure

Course Code: CSE207

Course Instructor :Dr. Anup Kumar Paul

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Section:03

Experiment Name:Write a program to perform the following operations on matrices: Addition,Subtraction, Multiplication, and Transpose.

Submitted by-

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Source Code:

Main Class:

```
package matrixOperation;
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        int row_size = 3;
        int col_size = 3;
        int[][] A = new int[row_size][col_size];
        int[][] B = new int[row_size][col_size];
        Scanner input = new Scanner(System.in);
        System.out.println("Enter matrix A of row " + row_size + " column " +
col_size);
        for (int i = 0; i < row_size; i++) {
            for (int j = 0; j < col_size; j++) {
                A[i][j] = input.nextInt();
            }
        }
        System.out.println("Enter matrix B of row " + row_size + " column " +
col_size);
        for (int i = 0; i < row_size; i++) {
            for (int j = 0; j < col_size; j++) {
                B[i][j] = input.nextInt();
            }
        }
        MatrixOperation matrix = new MatrixOperation(row_size, col_size);
        matrix.matrixMultiplication(A, B);
        matrix.printMatrix();
        matrix.matrixSubstraction(A, B);
    }
}
```

```

        matrix.printMatrix();
        matrix.matrixAddition(A, B);
        matrix.printMatrix();
        matrix.matrixTranspose(A,B);
        matrix.printMatrix();
    }
}

```

MatrixOperations:

```

package matrixOperation;
public class MatrixOperation {
    int[][] C;
    int row_size, col_size;
    public MatrixOperation(int row_size, int col_size) {
        this.row_size = row_size;
        this.col_size = col_size;
        this.C = new int[row_size][col_size];
    }
    public void matrixAddition(int[][] A, int[][] B) {
        for (int i = 0; i < row_size; i++) {
            for (int j = 0; j < col_size; j++) {
                C[i][j] = A[i][j] + B[i][j];
            }
        }
    }
    public void matrixSubstraction(int[][] A, int[][] B) {
        for (int i = 0; i < row_size; i++) {
            for (int j = 0; j < col_size; j++) {
                C[i][j] = A[i][j] - B[i][j];
            }
        }
    }
}

```

```

    }
}
public void matrixMultiplication(int[][] A, int[][] B) {
    for (int i = 0; i < row_size; i++) {
        for (int j = 0; j < col_size; j++) {
            int sum = 0;
            for (int k = 0; k < col_size; k++) {
                sum += A[i][k] * B[k][j];
            }
            C[i][j] = sum;
        }
    }
}

public void matrixTranspose(int[][] A,int[][] B) {
    for (int i = 0; i < row_size; i++) {
        for (int j = 0; j < col_size; j++) {
            C[j][i] = A[i][j];
        }
    }
}

public void printMatrix() {
    System.out.println("The matrix is");
    for (int i = 0; i < row_size; i++) {
        for (int j = 0; j < col_size; j++) {
            System.out.print(C[i][j] + "\t");
        }
        System.out.println();
    }
}
}

```

Output :

<terminated> Main (6) [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (Mar 11, 2024, 1:03:09 AM – 1:03:53 AM) [pid: 3256]

Enter matrix A of row 3 column 3

3 5 7

2 3 8

9 5 7

Enter matrix B of row 3 column 3

2 5 4

3 5 6

1 8 6

The matrix is

28	96	84
----	----	----

21	89	74
----	----	----

40	126	108
----	-----	-----

The matrix is

1	0	3
---	---	---

-1	-2	2
----	----	---

8	-3	1
---	----	---

The matrix is

5	10	11
---	----	----

5	8	14
---	---	----

10	13	13
----	----	----

The matrix is

3	2	9
---	---	---

5	3	5
---	---	---

7	8	7
---	---	---

