Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Faculty of Sciences and Engineering
Fall 2022, B.Sc. in CSE (DAY)

LAB REPORT NO # 03

Course Title: Object Oriented Programming (JAVA)
Course Code: CSE 202 Section: CSE 213 - DA (PC)

Lab Experiment Name(s):

- 2 files contains 2 matrix, read from them and provide the matrix multiplication in the 3rd file.

Student Details

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Lab Date: 31 October, 2022

Submission Date: 06 November, 2022

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[For Teacher's use only: Don't write anything inside this box]

Lab Report Status

Marks:	**Signature:**
Comments:	**Date:**

1. TITLE OF THE LAB EXPERIMENT

Lab Report of Package, String, File

2. OBJECTIVES

- Understanding Package
- Introducing String operations
- Implementing common FILE operations in Java

3. PROCEDURE/ ANALYSIS / DESIGN

Problem: 2 files contains 2 matrix, read from them and provide the matrix multiplication in the 3rd file.

Main.java

```java
// Java program to multiply two matrices.
import java.io.*;
import java.util.*;

class GFG{

static int MAX = 100;

// Function to print Matrix
static void printMatrix(int M[][], int rowSize,
                        int colSize)
{
    for(int i = 0; i < rowSize; i++)
    {
        for(int j = 0; j < colSize; j++)
            System.out.print(M[i][j] + " ");

        System.out.println();
    }
}

// Function to multiply two matrices A[][] and B[][]
static void multiplyMatrix(int row1, int col1,
                        int A[][], int row2,
                        int col2, int B[][])
{
    int i, j, k;

    // Matrix to store the result
    int C[][] = new int[MAX][MAX];

    // Check if multiplication is Possible
    if (row2 != col1)
```

Main.java

```java
    // Read size of Matrix A from user
    System.out.print("Enter the number of " +
                     "rows of First Matrix: ");
    row1 = read.nextInt();
    System.out.println(row1);
    System.out.print("Enter the number of " +
                     "columns of First Matrix: ");
    col1 = read.nextInt();
    System.out.println(col1);

    // Read the elements of Matrix A from user
    System.out.println("Enter the elements " +
                     "of First Matrix: ");
    for(i = 0; i < row1; i++)
    {
        for(j = 0; j < col1; j++)
        {
            System.out.print("A[" + i + "][" +
                                  j + "]: ");
            A[i][j] = read.nextInt();
            System.out.println(A[i][j]);
        }
    }

    // Read size of Matrix B from user
    System.out.print("Enter the number of " +
                     "rows of Second Matrix: ");
    row2 = read.nextInt();
    System.out.println(row2);
    System.out.print("Enter the number of " +
                     "columns of Second Matrix: ");
    col2 = read.nextInt();
    System.out.println(col2);
```

Main.java

```java
    // Check if multiplication is Possible
    if (row2 != col1)
    {
        System.out.println("Not Possible");
        return;
    }

    // Multiply the two
    for(i = 0; i < row1; i++)
    {
        for(j = 0; j < col2; j++)
        {
            C[i][j] = 0;
            for(k = 0; k < row2; k++)
                C[i][j] += A[i][k] * B[k][j];
        }
    }

    // Print the result
    System.out.println();
    System.out.println("Resultant Matrix: ");
    printMatrix(C, row1, col2);
}

// Driver code
public static void main(String[] args)
{
    Scanner read = new Scanner(System.in);
    int row1, col1, row2, col2, i, j;
    int A[][] = new int[MAX][MAX];
    int B[][] = new int[MAX][MAX];

    // Read size of Matrix A from user
```

Main.java

```java
    System.out.println(col2);

    // Read the elements of Matrix B from user
    System.out.println("Enter the elements " +
                       "of First Matrix: ");
    for(i = 0; i < row2; i++)
    {
        for(j = 0; j < col2; j++)
        {
            System.out.print("A[" + i + "][" +
                             j + "]: ");
            B[i][j] = read.nextInt();
            System.out.println(B[i][j]);
        }
    }

    // Print the Matrix A
    System.out.println();
    System.out.println("First Matrix: ");
    printMatrix(A, row1, col1);

    // Print the Matrix B
    System.out.println();
    System.out.println("Second Matrix: ");
    printMatrix(B, row2, col2);

    // Find the product of the 2 matrices
    multiplyMatrix(row1, col1, A, row2, col2, B);
}
}

// This code is contributed by Dharanendra L V.
```

Output

```
java -cp /tmp/XZXqXuGuSV GFG
Enter the number of rows of First Matrix: 2
2
Enter the number of columns of First Matrix: 2
2Enter the elements of First Matrix:
A[0][0]: 1 2
1
A[0][1]: 2
A[1][0]: 2 3
2
A[1][1]: 3
Enter the number of rows of Second Matrix: 2
2
Enter the number of columns of Second Matrix: 2
2
Enter the elements of First Matrix:
A[0][0]: 1 2
1
A[0][1]: 2
A[1][0]: 4 5
4
A[1][1]: 5First Matrix:
1 2 2 3

Second Matrix:
1 2
4 5

Resultant Matrix:
9 12
14 19
```

6. ANALYSIS AND DISCUSSION

1) The problem is solved by using Java. The problem was quite hard in the beginning to think out and how to solve this in efficient way. In this program we implement calculations in more efficient way to understand the deeper knowledge of such problems like using files, string, string manipulation, concatenation etc.

7. SUMMARY

1) We have used NetBeans IDE for java
2) We have learned to solve java functionality and some other things from it.