Week 08 : Programming Assignment 5

Due on 2025-03-20, 23:59 IST

Write a Java program to perform matrix multiplication.
The program should:

- - Read two matrices from user input.
- - Validate that matrix multiplication is possible (columns of first == rows of second).
- - Compute the product of the matrices.
- - Display the resulting matrix.

Expected Input/Output:

Input:
2 3 \ (Rows and Columns of first matrix)
1 2 3
4 5 6
3 2 \ (Rows and Columns of second matrix)
7 8
9 10
11 12

Output:
58 64
139 154

Input:
2 2
1 2
3 4
2 2
2 0
1 3

Output:
4 6
10 12

Private Test cases used for evaluation	Input	Expected Output	Actual Output	Status
Test Case 1	2 2 1 2 3 4 2 2 2 0 1 3	4 6\n 10 12	4 6\n 10 12\n	Passed

The due date for submitting this assignment has passed.
1 out of 1 tests passed.
You scored 100.0/100.

Assignment submitted on 2025-03-17, 23:25 IST
Your last recorded submission was :

```java
import java.util.Scanner;

public class W08_P5 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        int rows1 = scanner.nextInt();
        int cols1 = scanner.nextInt();
        int[][] matrix1 = new int[rows1][cols1];
        for (int i = 0; i < rows1; i++) {
            for (int j = 0; j < cols1; j++) {
                matrix1[i][j] = scanner.nextInt();
            }
        }

        int rows2 = scanner.nextInt();
        int cols2 = scanner.nextInt();
        int[][] matrix2 = new int[rows2][cols2];
        for (int i = 0; i < rows2; i++) {
            for (int j = 0; j < cols2; j++) {
                matrix2[i][j] = scanner.nextInt();
            }
        }
        if (cols1 != rows2) {
            System.out.println("Multiplication Not Possible");
            return;
        }

        int[][] result = new int[rows1][cols2];
        for (int i = 0; i < rows1; i++) {
            for (int j = 0; j < cols2; j++) {
                for (int k = 0; k < cols1; k++) {
                    result[i][j] += matrix1[i][k] * matrix2[k][j];
                }
            }
        }

for (int i = 0; i < rows1; i++) {
    for (int j = 0; j < cols2; j++) {
        System.out.print(result[i][j]);
        if (j < cols2 - 1)
        {
            System.out.print(" ");
        }
    }
    System.out.println();
}


scanner.close();
    }
}
```

Sample solutions (Provided by instructor)

```java
import java.util.Scanner;

public class W08_P5 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        int rows1 = scanner.nextInt();
        int cols1 = scanner.nextInt();
        int[][] matrix1 = new int[rows1][cols1];
        for (int i = 0; i < rows1; i++) {
            for (int j = 0; j < cols1; j++) {
                matrix1[i][j] = scanner.nextInt();
            }
        }

        int rows2 = scanner.nextInt();
        int cols2 = scanner.nextInt();
        int[][] matrix2 = new int[rows2][cols2];
        for (int i = 0; i < rows2; i++) {
            for (int j = 0; j < cols2; j++) {
                matrix2[i][j] = scanner.nextInt();
            }
        }
if (cols1 != rows2) {
    System.out.println("Multiplication Not Possible");
    return;
}

int[][] result = new int[rows1][cols2];
for (int i = 0; i < rows1; i++) {
    for (int j = 0; j < cols2; j++) {
        for (int k = 0; k < cols1; k++) {
            result[i][j] += matrix1[i][k] * matrix2[k][j];
        }
    }
}

for (int i = 0; i < rows1; i++) {
    for (int j = 0; j < cols2; j++) {
        System.out.print(result[i][j]);
        if (j < cols2 - 1) {
            System.out.print(" "); // Ensure no trailing space at the end of a row
        }
    }
    System.out.println(); // Move to the next row
}
scanner.close();
    }
}
```