4. Write a program in Java to multiply two matrices

```
import java.util.Scanner;

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

        // Read the dimensions of the first matrix
        System.out.print("Enter the number of rows for the first matrix: ");
        int rows1 = scanner.nextInt();

        System.out.print("Enter the number of columns for the first matrix: ");
        int cols1 = scanner.nextInt();

        // Read the dimensions of the second matrix
        System.out.print("Enter the number of rows for the second matrix: ");
        int rows2 = scanner.nextInt();

        System.out.print("Enter the number of columns for the second matrix: ");
        int cols2 = scanner.nextInt();

        // Validate the dimensions
        if (cols1 != rows2) {
            System.out.println("Invalid matrix dimensions for multiplication!");
            return;
        }

        // Read the elements of the first matrix
        System.out.println("Enter the elements of the first matrix:");
        int[][] matrix1 = new int[rows1][cols1];
        for (int i = 0; i < rows1; i++) {
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        for (int j = 0; j < cols1; j++) {
            matrix1[i][j] = scanner.nextInt();
        }
    }

    // Read the elements of the second matrix
    System.out.println("Enter the elements of the second matrix:");
    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();
        }
    }

    // Perform matrix multiplication
    int[][] result = multiplyMatrices(matrix1, matrix2);

    // Display the result
    System.out.println("Resultant matrix after multiplication:");
    displayMatrix(result);
}

public static int[][] multiplyMatrices(int[][] matrix1, int[][] matrix2) {
    int rows1 = matrix1.length;
    int cols1 = matrix1[0].length;
    int rows2 = matrix2.length;
    int cols2 = matrix2[0].length;

    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];
                }
            }
        }

        return result;
    }

    public static void displayMatrix(int[][] matrix) {
        int rows = matrix.length;
        int cols = matrix[0].length;

        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                System.out.print(matrix[i][j] + " ");
            }
            System.out.println();

    }
  }
}
```