Slip 6

10 Marks:

```
java
Copy code
import java.io.*;

class Sort {
    public static void main(String[] args) throws IOException {
        BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));
        int[] arr = new int[5];
        System.out.println("Enter 5 numbers:");

        for (int i = 0; i < 5; i++) {
            arr[i] = Integer.parseInt(br.readLine());
        }

        int temp;
        for (int i = 0; i < 5; i++) {
            for (int j = i + 1; j < 5; j++) {
                if (arr[i] > arr[j]) {
                    temp = arr[i];
                    arr[i] = arr[j];
                    arr[j] = temp;
                }
            }
        }

        System.out.println("Sorted numbers:");
        for (int i = 0; i < 5; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
```

20 Marks:

```
java
Copy code
import java.util.Scanner;

public class Matrix {
    public static void add(int[][] m1, int[][] m2, int rows, int cols) {
        int[][] result = new int[rows][cols];
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                result[i][j] = m1[i][j] + m2[i][j];
            }
        }
        System.out.println("Sum of matrices:");
        display(result, rows, cols);
    }
```

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    public static void multiply(int[][] m1, int[][] m2, int rows1, int cols1,
int cols2) {
        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] += m1[i][k] * m2[k][j];
                }
            }
        }
        System.out.println("Product of matrices:");
        display(result, rows1, cols2);
    }

    public static void transpose(int[][] m, int rows, int cols) {
        int[][] result = new int[cols][rows];
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                result[j][i] = m[i][j];
            }
        }
        System.out.println("Transpose of matrix:");
        display(result, cols, rows);
    }

    public static void display(int[][] m, int rows, int cols) {
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                System.out.print(m[i][j] + " ");
            }
            System.out.println();
        }
    }

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

        System.out.print("Enter rows and columns of Matrix 1: ");
        int rows1 = sc.nextInt(), cols1 = sc.nextInt();
        int[][] m1 = new int[rows1][cols1];
        System.out.println("Enter elements of Matrix 1:");
        for (int i = 0; i < rows1; i++) {
            for (int j = 0; j < cols1; j++) {
                m1[i][j] = sc.nextInt();
            }
        }

        System.out.print("Enter rows and columns of Matrix 2: ");
        int rows2 = sc.nextInt(), cols2 = sc.nextInt();
        int[][] m2 = new int[rows2][cols2];
        System.out.println("Enter elements of Matrix 2:");
        for (int i = 0; i < rows2; i++) {
            for (int j = 0; j < cols2; j++) {
                m2[i][j] = sc.nextInt();
            }
        }
```

```
        int choice;
        do {
            System.out.println("\n1. Add\n2. Multiply\n3. Transpose\n4.
Exit");
            System.out.print("Enter your choice: ");
            choice = sc.nextInt();
            switch (choice) {
                case 1:
                    if (rows1 == rows2 && cols1 == cols2)
                        add(m1, m2, rows1, cols1);
                    else
                        System.out.println("Matrices must have the same
dimensions for addition.");
                    break;
                case 2:
                    if (cols1 == rows2)
                        multiply(m1, m2, rows1, cols1, cols2);
                    else
                        System.out.println("Matrices cannot be multiplied
(column of matrix 1 must match row of matrix 2).");
                    break;
                case 3:
                    System.out.println("Select Matrix 1 or 2 for
transpose:");
                    int matrix = sc.nextInt();
                    if (matrix == 1) {
                        transpose(m1, rows1, cols1);
                    } else {
                        transpose(m2, rows2, cols2);
                    }
                    break;
                case 4:
                    System.out.println("Exiting program...");
                    break;
                default:
                    System.out.println("Invalid choice!");
            }
        } while (choice != 4);
    }
}
```