

CS0557 - Cryptography Laboratory

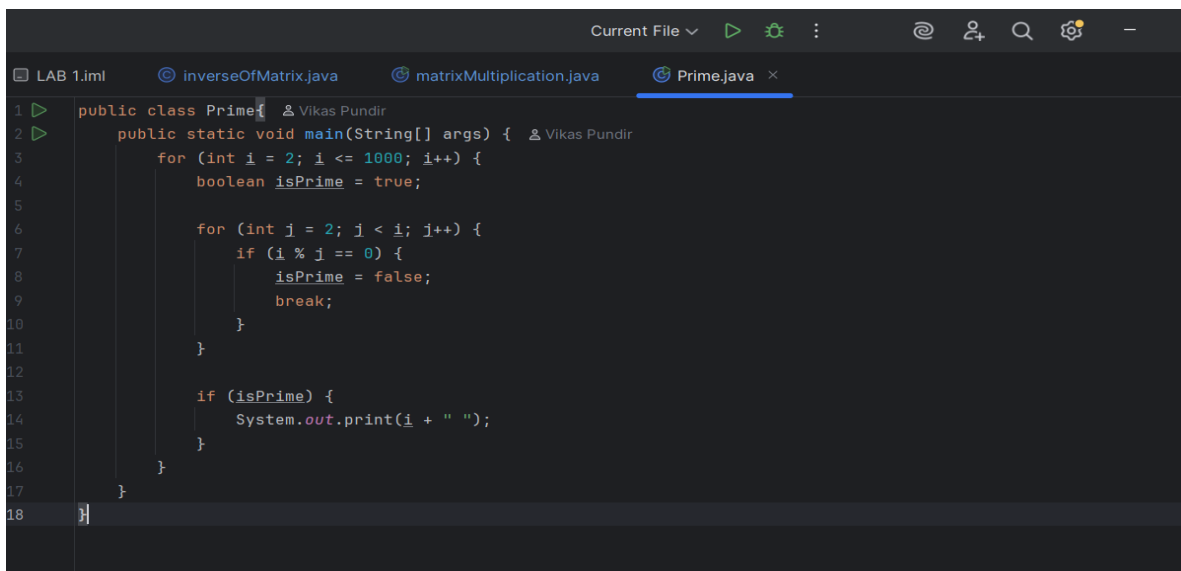
Lab 1 - Assignment Solution

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Section:	<u>M.Tech CSE (IS)</u>	Date:	26 / August / 2025

Q1. Prime numbers between 1 and 1000

Write a program to compute and list all prime numbers between 1 and 1000.

Answer (Java):

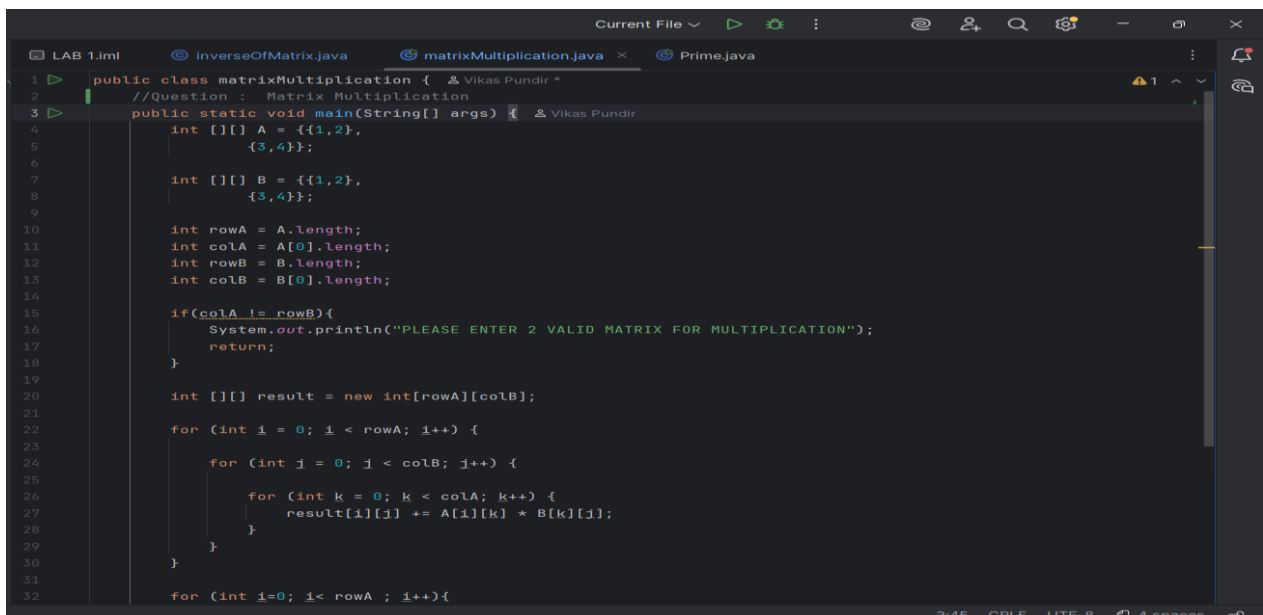


```
1 public class Prime { // Vikas Pundir
2     public static void main(String[] args) { // Vikas Pundir
3         for (int i = 2; i <= 1000; i++) {
4             boolean isPrime = true;
5
6             for (int j = 2; j < i; j++) {
7                 if (i % j == 0) {
8                     isPrime = false;
9                     break;
10                }
11            }
12
13            if (isPrime) {
14                System.out.print(i + " ");
15            }
16        }
17    }
18 }
```

Q2. Matrix Multiplication

Implement matrix multiplication for two square matrices.

Answer (Java):



```
1 public class MatrixMultiplication { // Vikas Pundir
2     //Question : Matrix Multiplication
3     public static void main(String[] args) { // Vikas Pundir
4         int [][] A = {{1,2},
5                       {3,4}};
6
7         int [][] B = {{1,2},
8                       {3,4}};
9
10        int rowA = A.length;
11        int colA = A[0].length;
12        int rowB = B.length;
13        int colB = B[0].length;
14
15        if (colA != rowB) {
16            System.out.println("PLEASE ENTER 2 VALID MATRIX FOR MULTIPLICATION");
17            return;
18        }
19
20        int [][] result = new int[rowA][colB];
21
22        for (int i = 0; i < rowA; i++) {
23            for (int j = 0; j < colB; j++) {
24                for (int k = 0; k < colA; k++) {
25                    result[i][j] += A[i][k] * B[k][j];
26                }
27            }
28        }
29
30        for (int i=0; i< rowA ; i++){
31
32        }
```

```
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LAB 1.iml  inverseOfMatrix.java  matrixMultiplication.java  Prime.java
1  public class matrixMultiplication {  Vikas Pundir *
3  public static void main(String[] args) {  Vikas Pundir
17      return;
18  }
19
20      int [][] result = new int[rowA][colB];
21
22      for (int i = 0; i < rowA; i++) {
23
24          for (int j = 0; j < colB; j++) {
25
26              for (int k = 0; k < colA; k++) {
27                  result[i][j] += A[i][k] * B[k][j];
28              }
29          }
30      }
31
32      for (int i=0; i< rowA ; i++){
33          for (int j = 0; j< colB; j++){
34              System.out.print(result[i][j] + " ");
35          }
36          System.out.println();
37      }
38
39  }
40
41  }
```

Q3. Inverse of a Matrix (2×2)

Write a Java program to compute the inverse of a 2×2 static matrix.

Answer (Java):

```
CR CRYPTOGRAPHY LAB  main ▾
LAB 1.iml  inverseOfMatrix.java  matrixMultiplication.java  Prime.java
1  ▶ public class inverseOfMatrix {  Vikas Pundir *
2  ▶ public static void main(String[] args) {  Vikas Pundir *
3      // Static 2x2 Matrix
4      double[][] A = {
5          {4, 7},
6          {2, 6}
7      };
8
9      // Calculate determinant
10     double det = (A[0][0] * A[1][1]) - (A[0][1] * A[1][0]);
11
12     if (det == 0) {
13         System.out.println("Inverse does not exist (determinant is 0)");
14         return;
15     }
16
17     // Inverse formula for 2x2 matrix
18     double[][] inverse = new double[2][2];
19     inverse[0][0] = A[1][1] / det;
20     inverse[0][1] = -A[0][1] / det;
21     inverse[1][0] = -A[1][0] / det;
22     inverse[1][1] = A[0][0] / det;
23
24     // Display inverse
25     System.out.println("Inverse of matrix:");
26     for (int i = 0; i < 2; i++) {
27         for (int j = 0; j < 2; j++) {
28             System.out.print(inverse[i][j] + " ");
29         }
30         System.out.println();
31     }
32 }
```

End of Lab 1 Assignment