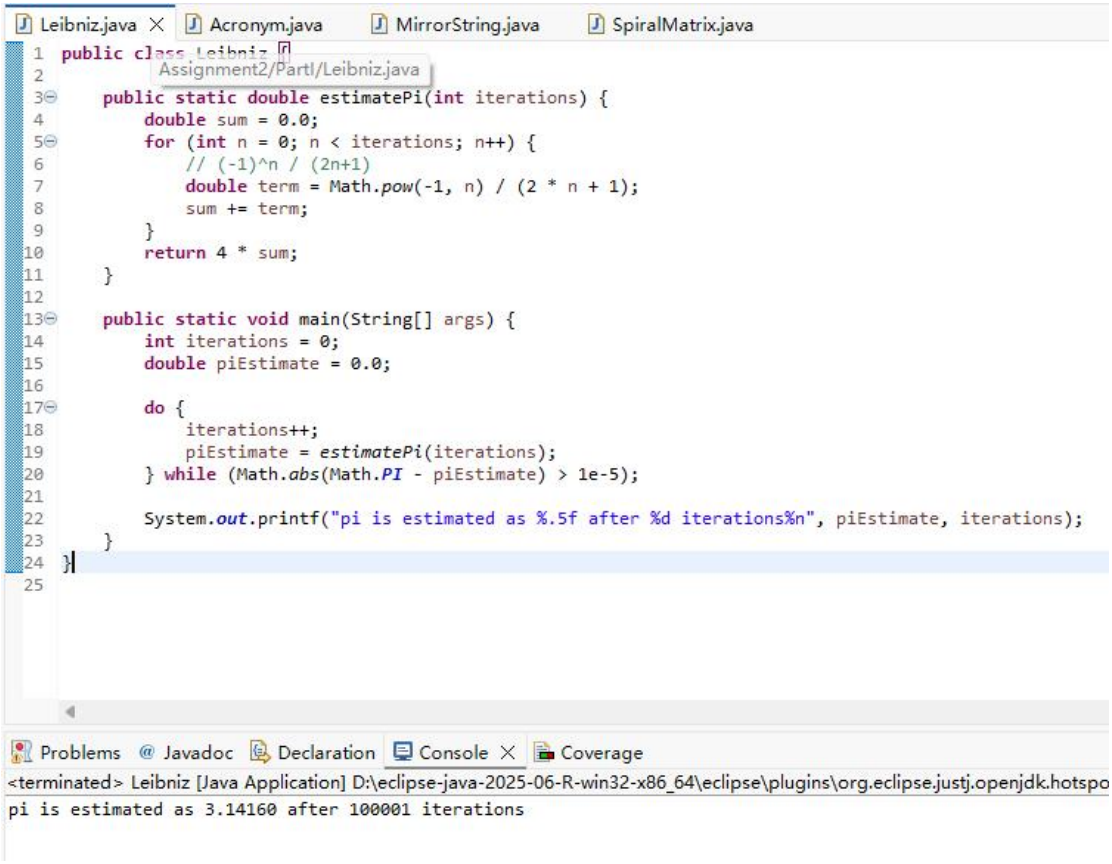
Part1:


Leibniz.java
Acronym.java
MirrorString.java
SpiralMatrix.java
public class Leibniz {
Assignment2/PartI/Leibniz.java
public static double estimatePi(int iterations) {
double sum = 0.0;
for (int n = 0; n < iterations; n++) {
// (-1)^n / (2n+1)
double term = Math.pow(-1, n) / (2 * n + 1);
sum += term;
}
return 4 * sum;
}
public static void main(String[] args) {
int iterations = 0;
double piEstimate = 0.0;
do {
iterations++;
piEstimate = estimatePi(iterations);
} while (Math.abs(Math.PI - piEstimate) > 1e-5);
System.out.printf("pi is estimated as %.5f after %d iterations%n", piEstimate, iterations);
}
}
Problems
Javadoc
Declaration
Console
Coverage
<terminated> Leibniz [Java Application] D:\eclipse-java-2025-06-R-win32-x86_64\eclipse\plugins\org.eclipse.justj.openjdk.hotspo
pi is estimated as 3.14160 after 100001 iterations

Part2:

Leibniz.java | Acronym.java | MirrorString.java | SpiralMatrix.java

```java
import java.util.*;

public class SpiralMatrix {

    public static int[] spiralMatrix(int[][] matrix) {
        int m = matrix.length;
        int n = matrix[0].length;
        int[] ans = new int[m * n];
        int idx = 0;

        int top = 0, bottom = m - 1, left = 0, right = n - 1;

        while (top <= bottom && left <= right) {
            for (int j = left; j <= right; j++) ans[idx++] = matrix[top][j];
            top++;

            for (int i = top; i <= bottom; i++) ans[idx++] = matrix[i][right];
            right--;

            if (top <= bottom) {
                for (int j = right; j >= left; j--) ans[idx++] = matrix[bottom][j];
                bottom--;
            }

            if (left <= right) {
                for (int i = bottom; i >= top; i--) ans[idx++] = matrix[i][left];
                left++;
            }
        }
        return ans;
    }

    public static void main(String[] args) {
        int[][] matrix = {
            { 1,  2,  3,  4},
            { 5,  6,  7,  8},
            { 9, 10, 11, 12},
            {13, 14, 15, 16},
            {17, 18, 19, 20}
        };

        System.out.println("Matrix (row by row):");
        for (int i = 0; i < matrix.length; i++) {
            for (int j = 0; j < matrix[0].length; j++) {
                System.out.printf("%3d ", matrix[i][j]);
            }
            System.out.println();
        }

        int[] spiral = spiralMatrix(matrix);
        System.out.println("\nSpiral order:");
        System.out.println(Arrays.toString(spiral));
    }
}
```

Problems | Javadoc | Declaration | Console | Coverage

<terminated> SpiralMatrix [Java Application] D:\eclipse-java-2025-06-R-win32-x86_64\eclipse\plugins\org.ecli

```
Matrix (row by row):
  1   2   3   4
  5   6   7   8
  9  10  11  12
 13  14  15  16
 17  18  19  20

Spiral order:
[1, 2, 3, 4, 8, 12, 16, 20, 19, 18, 17, 13, 9, 5, 6, 7, 11, 15, 14, 10]
```

Part3:

1:

Leibniz.java | Acronym.java | MirrorString.java | SpiralMatrix.java

```
1
2  public class Acronym {
3
4      public static String createAcronym(String input) {
5          String result = "";
6
7          String[] words = input.split(" ");
8          for (String word : words) {
9              if (word.length() > 0) {
10                 char c = Character.toUpperCase(word.charAt(0));
11                 result += c;  //
12             }
13         }
14         return result;
15     }
16
17     public static void main(String[] args) {
18         String s1 = "as soon as possible";
19         String s2 = "The quick brown fox jumps over the lazy dog";
20
21         System.out.println("Acronym of s1: " + createAcronym(s1)); //  ASAP
22         System.out.println("Acronym of s2: " + createAcronym(s2)); // TQBFJOTLD
23     }
24 }
25
```

Problems | Javadoc | Declaration | Console | Coverage

<terminated> Acronym [Java Application] D:\eclipse-java-2025-06-R-win32-x86_64\eclipse\plugins\org.eclips

```
Acronym of s1: ASAP
Acronym of s2: TQBFJOTLD
```

2:

Leibniz.java | Acronym.java | MirrorString.java | SpiralMatrix.java

```java

public class MirrorString {

    public static String mirrorString(String input) {
        String reversed = "";
        for (int i = input.length() - 1; i >= 0; i--) {
            reversed += input.charAt(i);
        }
        return input + reversed;
    }

    public static void main(String[] args) {
        String input1 = "hello";
        String input2 = "java";
        String input3 = "a";

        System.out.println("Mirror of " + input1 + " is " + mirrorString
        System.out.println("Mirror of " + input2 + " is " + mirrorString
        System.out.println("Mirror of " + input3 + " is " + mirrorString
    }
}

```

Problems | Javadoc | Declaration | Console | Coverage

<terminated> MirrorString [Java Application] D:\eclipse-java-2025-06-R-win32-x86_64\eclipse

```
Mirror of hello is helloolleh
Mirror of java is javaavaj
Mirror of a is aa
```