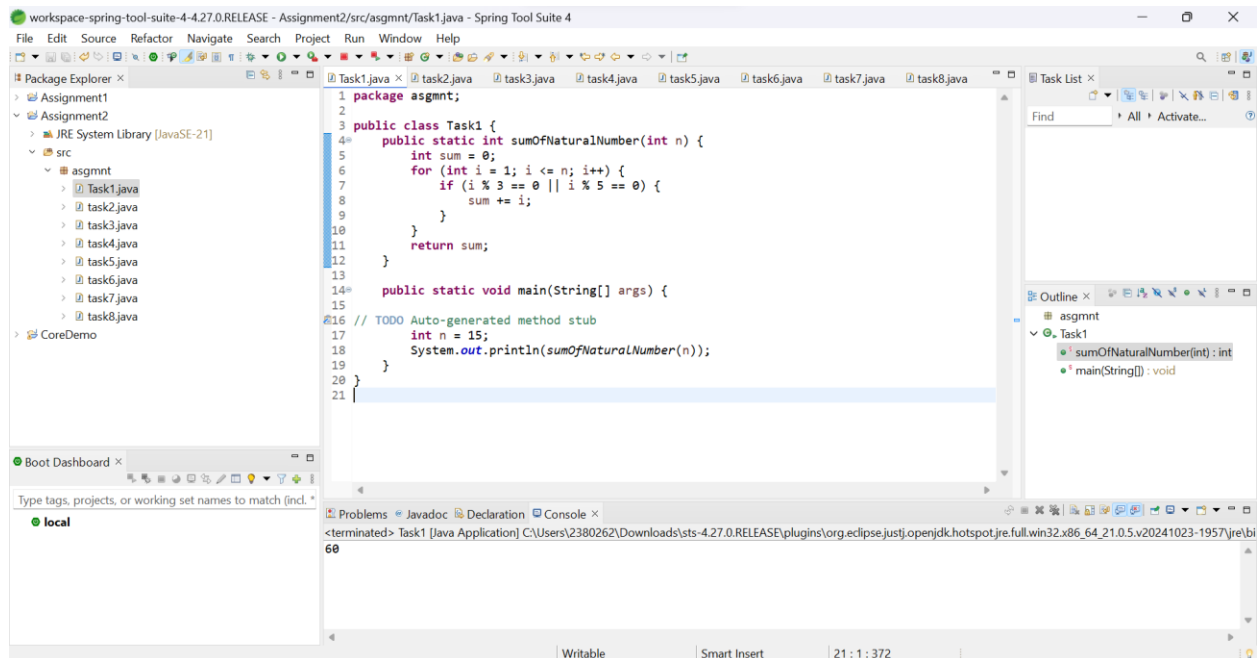


# Thilak Rai – 2380262

## Task 1:

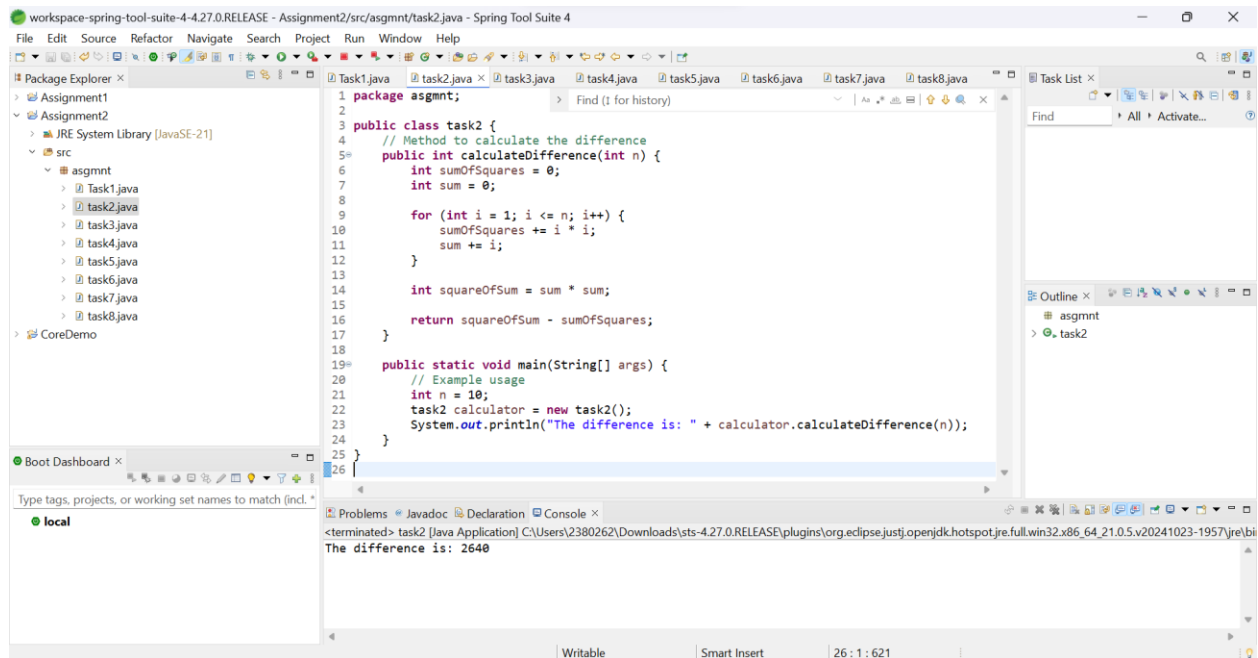


The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with 'Assignment2' containing a 'src' folder with 'Task1.java'.
- Code Editor:** Displays the code for 'Task1.java' in the 'package asgmt;' namespace. The code defines a 'Task1' class with a 'sumOfNaturalNumber' method and a 'main' method. The 'sumOfNaturalNumber' method calculates the sum of natural numbers from 1 to n, skipping multiples of 3 and 5.
- Task List:** Shows the 'Task1' class and its methods: 'sumOfNaturalNumber(int): int' and 'main(String[]): void'.
- Console:** Shows the output of the program: '60'.

```
1 package asgmt;
2
3 public class Task1 {
4     public static int sumOfNaturalNumber(int n) {
5         int sum = 0;
6         for (int i = 1; i <= n; i++) {
7             if (i % 3 == 0 || i % 5 == 0) {
8                 sum += i;
9             }
10        }
11        return sum;
12    }
13
14    public static void main(String[] args) {
15        // TODO Auto-generated method stub
16        int n = 15;
17        System.out.println(sumOfNaturalNumber(n));
18    }
19 }
20
21
```

## Task 2:



The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with 'Assignment2' containing a 'src' folder with 'task2.java'.
- Code Editor:** Displays the code for 'task2.java' in the 'package asgmt;' namespace. The code defines a 'task2' class with a 'calculateDifference' method and a 'main' method. The 'calculateDifference' method calculates the difference between the sum of squares and the square of the sum of numbers from 1 to n.
- Task List:** Shows the 'task2' class and its methods: 'calculateDifference(int): int' and 'main(String[]): void'.
- Console:** Shows the output of the program: 'The difference is: 2640'.

```
1 package asgmt;
2
3 public class task2 {
4     // Method to calculate the difference
5     public int calculateDifference(int n) {
6         int sumOfSquares = 0;
7         int sum = 0;
8
9         for (int i = 1; i <= n; i++) {
10            sumOfSquares += i * i;
11            sum += i;
12        }
13
14        int squareOfSum = sum * sum;
15
16        return squareOfSum - sumOfSquares;
17    }
18
19    public static void main(String[] args) {
20        // Example usage
21        int n = 10;
22        task2 calculator = new task2();
23        System.out.println("The difference is: " + calculator.calculateDifference(n));
24    }
25 }
26
```

## Task 3:

The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with `Assignment2` containing `src` and `asmnt` packages. `task3.java` is selected.
- Editor:** Displays the code for `task3.java`. The code defines a `task3` class with a `checkNumber` method that checks if a number is increasing and a `main` method that tests it with the value 134468.
- Outline:** Shows the class structure with `task3` and its methods `checkNumber(int): boolean` and `main(String[]): void`.
- Console:** Shows the output of the program: `The number 134468 is increasing: true`.

```
1 package asmnt;
2
3 public class task3 {
4     // Method to check if a number is an increasing number
5     public boolean checkNumber(int number) {
6         String numStr = Integer.toString(number);
7
8         for (int i = 0; i < numStr.length() - 1; i++) {
9             if (numStr.charAt(i) > numStr.charAt(i + 1)) {
10                 return false;
11             }
12         }
13         return true;
14     }
15
16     public static void main(String[] args) {
17         // Example usage
18         task3 checker = new task3();
19         int number = 134468;
20         System.out.println("The number " + number + " is increasing: " + checker.checkNumber(number));
21     }
22 }
23
24
```

## Task 4:

The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with `Assignment2` containing `src` and `asmnt` packages. `task4.java` is selected.
- Editor:** Displays the code for `task4.java`. The code defines a `task4` class with a `checkNumber` method that checks if a number is a power of two and a `main` method that tests it with the value 8.
- Outline:** Shows the class structure with `asmnt` and `task4`.
- Console:** Shows the output of the program: `The number 8 is a power of two: true`.

```
1 package asmnt;
2
3 public class task4 {
4     // Method to check if a number is a power of two
5     public boolean checkNumber(int n) {
6         if (n <= 0) {
7             return false;
8         }
9
10        return (n & (n - 1)) == 0;
11    }
12
13    public static void main(String[] args) {
14        // Example usage
15        task4 checker = new task4();
16        int number = 8;
17        System.out.println("The number " + number + " is a power of two: " + checker.checkNumber(number));
18    }
19 }
20
21
```

## Task 5:

The screenshot shows the Eclipse IDE with the Spring Tool Suite 4. The Package Explorer on the left shows the project structure: Assignment1, Assignment2, JRE System Library [JavaSE-21], src, and CoreDemo. The src folder contains Task1.java through Task8.java. The main editor displays the code for Task5.java. The code defines a class Task5 with a constructor, a display() method, and a main() method. The main() method creates an Employee object and calls the display() method. The console output shows the details of the Employee object.

```
10 public Task5(int empId, String empName, double empSal, String empAdd, String empGender) {
11     this.empId = empId;
12     this.empName = empName;
13     this.empSal = empSal;
14     this.empAdd = empAdd;
15     this.empGender = empGender;
16     this.empEmail = empEmail;
17 }
18
19
20 public void display() {
21     System.out.println("Employee ID: " + empId);
22     System.out.println("Employee Name: " + empName);
23     System.out.println("Employee Salary: " + empSal);
24     System.out.println("Employee Address: " + empAdd);
25     System.out.println("Employee Gender: " + empGender);
26     System.out.println("Employee Email: " + empEmail);
27 }
28
29 public static void main(String[] args) {
30     Task5 emp = new Task5(101, "Jenny", 70000, "Hyderabad", "Male", "jenny@gmail.com");
31     emp.display();
32 }
33 }
34
35
```

Console Output:

```
<terminated> task5 [Java Application] C:\Users\2380262\Downloads\sts-4.27.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_21.0.5.v20241023-1957\jre\bin\java.exe
Employee ID: 101
Employee Name: Jenny
Employee Salary: 70000.0
Employee Address: Hyderabad
Employee Gender: Male
Employee Email: jenny@gmail.com
```

## Task 6:

The screenshot shows the Eclipse IDE with the Spring Tool Suite 4. The Package Explorer on the left shows the project structure: Assignment1, Assignment2, JRE System Library [JavaSE-21], src, and CoreDemo. The src folder contains Task1.java through Task8.java. The main editor displays the code for Task6.java. The code defines a class Task6 with a main() method. The main() method uses a Scanner to take input from the user and performs arithmetic operations (sum, difference, product, quotient, remainder) on the input numbers. The console output shows the results of these operations.

```
5 public class Task6 {
6     public static void main(String[] args) {
7         Scanner scanner = new Scanner(System.in);
8
9         System.out.print("Input first number: ");
10        int num1 = scanner.nextInt();
11
12        System.out.print("Input second number: ");
13        int num2 = scanner.nextInt();
14
15        int sum = num1 + num2;
16        int difference = num1 - num2;
17        int product = num1 * num2;
18        int quotient = num1 / num2;
19        int remainder = num1 % num2;
20
21        System.out.println(num1 + " + " + num2 + " = " + sum);
22        System.out.println(num1 + " - " + num2 + " = " + difference);
23        System.out.println(num1 + " x " + num2 + " = " + product);
24        System.out.println(num1 + " / " + num2 + " = " + quotient);
25        System.out.println(num1 + " % " + num2 + " = " + remainder);
26
27        scanner.close();
28    }
29 }
30
```

Console Output:

```
<terminated> task6 [Java Application] C:\Users\2380262\Downloads\sts-4.27.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_21.0.5.v20241023-1957\jre\bin\java.exe
Input first number: 125
Input second number: 24
125 + 24 = 149
125 - 24 = 101
125 x 24 = 3000
125 / 24 = 5
125 % 24 = 5
```

## Task 7:

The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with 'Assignment2' containing 'src' and 'asmnt' folders. 'asmnt' contains 'Task1.java' through 'Task8.java'.
- Editor:** Displays 'task7.java' with the following code:

```
import java.util.Scanner;

public class task7 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Input the first number: ");
        int num1 = scanner.nextInt();

        System.out.print("Input the second number: ");
        int num2 = scanner.nextInt();

        System.out.print("Input the third number: ");
        int num3 = scanner.nextInt();

        int smallest = findSmallest(num1, num2, num3);

        System.out.println("The smallest value is " + smallest);

        scanner.close();
    }

    public static int findSmallest(int num1, int num2, int num3) {
        return Math.min(num1, Math.min(num2, num3));
    }
}
```
- Outline:** Shows the class structure with 'task7' containing 'main(String[]): void' and 'findSmallest(int, int, int): int'.
- Console:** Shows the output of the program:

```
<terminated> task7 [Java Application] C:\Users\2380262\Downloads\sts-4.27.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_21.0.5.v20241023-1957\jre\bin\java.exe
Input the first number: 25
Input the second number: 37
Input the third number: 29
The smallest value is 25
```

## Task 8:

The screenshot shows the Spring Tool Suite 4 IDE with the following components:

- Package Explorer:** Shows the project structure with 'Assignment2' containing 'src' and 'asmnt' folders. 'asmnt' contains 'Task1.java' through 'Task8.java'.
- Editor:** Displays 'task8.java' with the following code:

```
public class task8 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input the three numbers
        System.out.print("Input the first number: ");
        int num1 = scanner.nextInt();

        System.out.print("Input the second number: ");
        int num2 = scanner.nextInt();

        System.out.print("Input the third number: ");
        int num3 = scanner.nextInt();

        // Compute the average
        double average = computeAverage(num1, num2, num3);

        // Print the average
        System.out.println("The average value is " + average);

        scanner.close();
    }

    // Method to compute the average of three numbers
    public static double computeAverage(int num1, int num2, int num3) {
        return (num1 + num2 + num3) / 3.0;
    }
}
```
- Outline:** Shows the class structure with 'task8' containing 'main(String[]): void' and 'computeAverage(int, int, int): double'.
- Console:** Shows the output of the program:

```
<terminated> task8 [Java Application] C:\Users\2380262\Downloads\sts-4.27.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_21.0.5.v20241023-1957\jre\bin\java.exe
Input the first number: 25
Input the second number: 45
Input the third number: 65
The average value is 45.0
```