Lab_2

1.Write a program that takes a student's score as input and outputs the corresponding grade based on the following scale:

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: 0-59

Program:

```
package demo;
import java.util.Scanner;
public class GradeCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        // Input score
        System.out.print("Enter the student's score (0-100): ");
        int score = scanner.nextInt();
        // Get and print the grade
        String grade = getGrade(score);
        System.out.println("The grade for the score " + score + " is: " +
grade);
        scanner.close();
    }
    // Function to determine the grade based on score
    public static String getGrade(int score) {
        if (score >= 90) {
            return "A";
        } else if (score >= 80) {
            return "B";
        } else if (score >= 70) {
            return "C";
        } else if (score >= 60) {
            return "D";
        } else {
            return "F";
        }
    }
}
```

Output:

ProgramSeco... | Main.java | Calculator.java | A.java | LeapYear.java | *GradeCalcul...

```java
package demo;
import java.util.Scanner;
public class GradeCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        // Input score
        System.out.print("Enter the student's score (0-100): ");
        int score = scanner.nextInt();
        // Get and print the grade
        String grade = getGrade(score);
        System.out.println("The grade for the score " + score + " is: " + grade);
        scanner.close();
    }
    // Function to determine the grade based on score
    public static String getGrade(int score) {
        if (score >= 90) {
            return "A";
        } else if (score >= 80) {
            return "B";
        } else if (score >= 70) {
            return "C";
        } else if (score >= 60) {
            return "D";
        } else {
            return "F";
        }
    }
}
```

Problems | Javadoc | Declaration | Console

```
<terminated> GradeCalculator [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe  (18-May-2024, 10:05:29 am – 10:05:52 a
Enter the student's score (0-100): 99
The grade for the score 99 is: A
```

2. Write a program to check if a given year is a leap year. (A year is a leap year if it is divisible by 4 but not by 100, or it is divisible by 400.)

Program:

```
package demo;
import java.util.Scanner;
public class LeapYear {
    public static void main(String[] args) {
        // Create a Scanner object to read input from the user
        Scanner scanner = new Scanner(System.in);
        // Prompt the user to input a year
        System.out.print("Enter a year: ");
        int year = scanner.nextInt();
        // Check if the entered year is a leap year
        if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
            System.out.println(year + " is a leap year.");
        } else {
            System.out.println(year + " is not a leap year.");
        }
        // Close the Scanner
        scanner.close();
    }
}
```

Output:

A.java | VowelConsona... | LeapYear.java | GradeCalcula... | NumberChecke...

```
package demo;
import java.util.Scanner;
public class LeapYear {
    public static void main(String[] args) {
        // Create a Scanner object to read input from the user
        Scanner scanner = new Scanner(System.in);
        // Prompt the user to input a year
        System.out.print("Enter a year: ");
        int year = scanner.nextInt();
        // Check if the entered year is a leap year
        if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
            System.out.println(year + " is a leap year.");
        } else {
            System.out.println(year + " is not a leap year.");
        }
        // Close the Scanner
        scanner.close();
    }
}
```

Problems | Javadoc | Declaration | Console

```
<terminated> LeapYear [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (18-May-2024, 10:31:05 am –
Enter a year: 2025
2025 is not a leap year.
```

3.Write a program that takes an integer as input and checks if it is positive, negative, or zero.

Program:

```
package demo;
import java.util.Scanner;
public class NumberChecker {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        // Input integer
        System.out.print("Enter an integer: ");
        int number = scanner.nextInt();
        // Check if the number is positive, negative, or zero
        if (number > 0) {
            System.out.println("The number is positive.");
        } else if (number < 0) {
            System.out.println("The number is negative.");
        } else {
            System.out.println("The number is zero.");
        }
        scanner.close();
    }
}
```

Output:

A.java | VowelConsona... | LeapYear.java | GradeCalcula... | NumberChecke...

```
package demo;
import java.util.Scanner;
public class NumberChecker {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        // Input integer
        System.out.print("Enter an integer: ");
        int number = scanner.nextInt();
        // Check if the number is positive, negative, or zero
        if (number > 0) {
            System.out.println("The number is positive.");
        } else if (number < 0) {
            System.out.println("The number is negative.");
        } else {
            System.out.println("The number is zero.");
        }
        scanner.close();
    }
}
```

Problems | Javadoc | Declaration | Console

```
<terminated> NumberChecker [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe  (18-May-2
Enter an integer: 9
The number is positive.
```

```
Problems  @ Javadoc  Declaration  Console ×
<terminated> NumberChecker [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe  (18-May-2024, 10:34:44
Enter an integer: -10
The number is negative.
```

```
Problems  @ Javadoc  Declaration  Console ×
<terminated> NumberChecker [Java Application] C:\Program Files\Java\jdk-2
Enter an integer: 0
The number is zero.
```

4.Write a program that prints numbers from 1 to 10 using a loop.

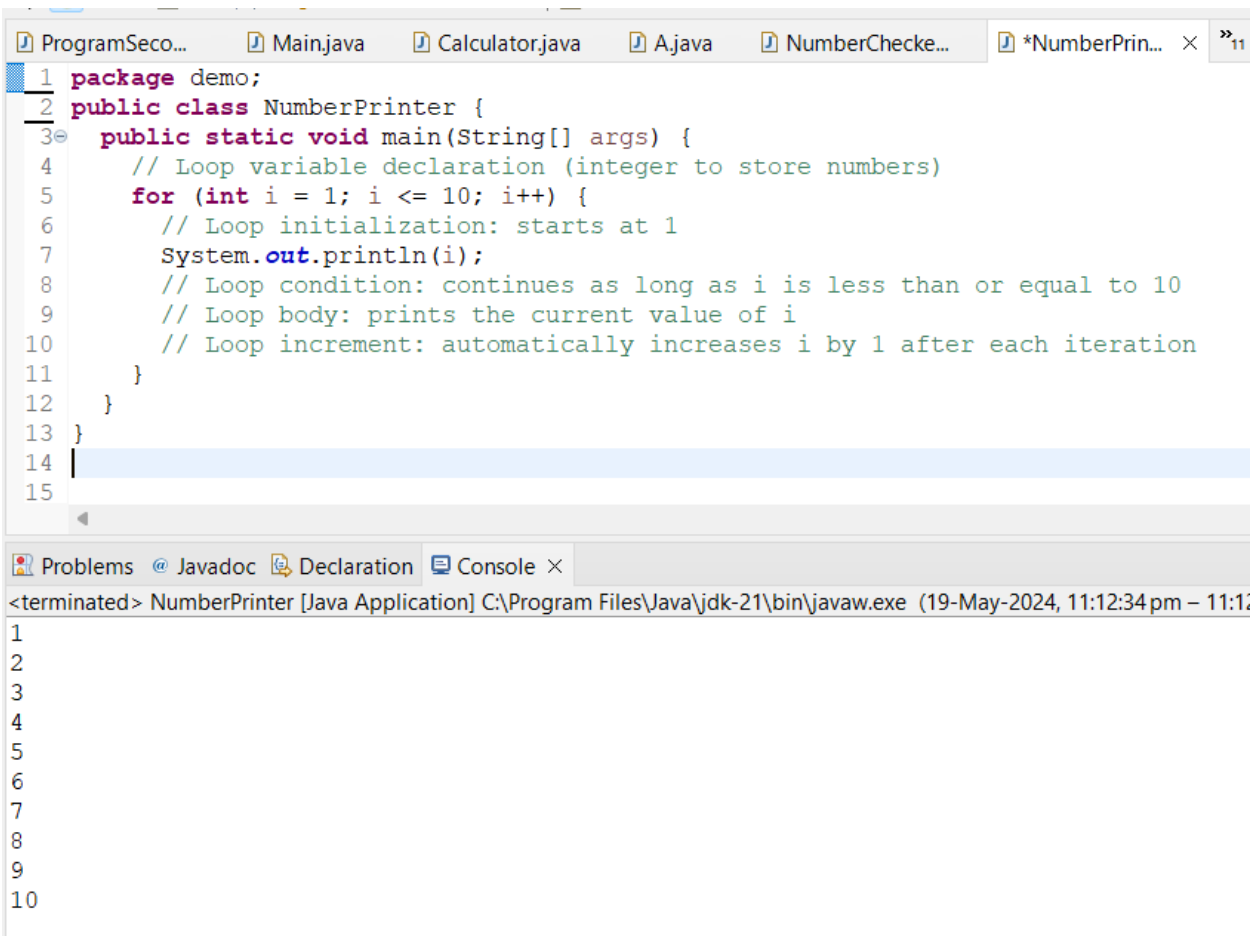
Program:

```java
package demo;

public class NumberPrinter {

  public static void main(String[] args) {
    // Loop variable declaration (integer to store numbers)
    for (int i = 1; i <= 10; i++) {
      // Loop initialization: starts at 1
      System.out.println(i);
      // Loop condition: continues as long as i is less than or equal to 10
      // Loop body: prints the current value of i
      // Loop increment: automatically increases i by 1 after each iteration
    }
  }
}
```

Output:

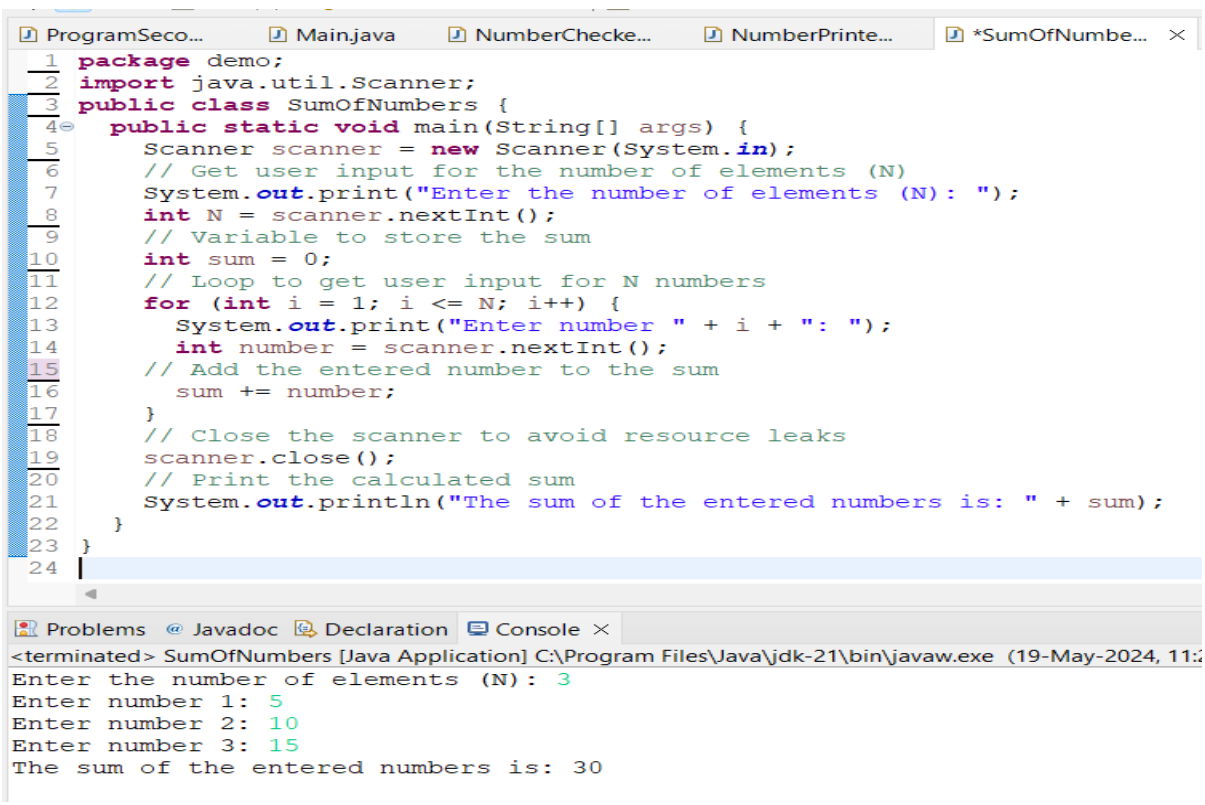


5.Write a program that takes an integer N as input and calculates the sum of entered numbers.

Program:

```
package demo;
import java.util.Scanner;
public class SumOfNumbers {
  public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    // Get user input for the number of elements (N)
    System.out.print("Enter the number of elements (N): ");
    int N = scanner.nextInt();
    // Variable to store the sum
    int sum = 0;
    // Loop to get user input for N numbers
    for (int i = 1; i <= N; i++) {
      System.out.print("Enter number " + i + ": ");
      int number = scanner.nextInt();
    // Add the entered number to the sum
      sum += number;
    }
    // Close the scanner to avoid resource leaks
    scanner.close();
    // Print the calculated sum
    System.out.println("The sum of the entered numbers is: " + sum);
  }
}
```

Output:



6.Write a program that takes an integer as input and prints its multiplication table up to 10.

Program:

```
package demo;
import java.util.Scanner;
public class MultiplicationTable {
      public static void main(String[] args) {
            // TODO Auto-generated method stub
                Scanner scanner = new Scanner(System.in);
                // Get user input for the number
                System.out.print("Enter an integer: ");
                int number = scanner.nextInt();
                // Print the multiplication table
                System.out.println("Multiplication table of " + number +
":");
                for (int i = 1; i <= 10; i++) {
                  System.out.println(number + " * " + i + " = " + (number *
i));
                }
                scanner.close(); // Close the scanner to avoid resource leaks
              }
      }
```

Output:

ProgramSeco... NumberChecke... NumberPrinte... SumOfNumber... *Multiplica...

```
package demo;
import java.util.Scanner;
public class MultiplicationTable {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
            Scanner scanner = new Scanner(System.in);
            // Get user input for the number
            System.out.print("Enter an integer: ");
            int number = scanner.nextInt();
            // Print the multiplication table
            System.out.println("Multiplication table of " + number + ":");
            for (int i = 1; i <= 10; i++) {
              System.out.println(number + " * " + i + " = " + (number * i));
            }
            scanner.close(); // Close the scanner to avoid resource leaks
          }
    }
```

Problems Javadoc Declaration Console

```
<terminated> MultiplicationTable [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (20-May-2024, 12:12:18 a
Enter an integer: 9
Multiplication table of 9:
9 * 1 = 9
9 * 2 = 18
9 * 3 = 27
9 * 4 = 36
9 * 5 = 45
9 * 6 = 54
9 * 7 = 63
9 * 8 = 72
9 * 9 = 81
9 * 10 = 90
```

7. Write a program that takes a positive integer as input and prints its digits in reverse order.

Program:

```
package demo;
import java.util.Scanner;
public class ReverseDigits {
      public static void main(String[] args) {
            // TODO Auto-generated method stub
            Scanner scanner = new Scanner(System.in);
          // Get user input for the number
          System.out.print("Enter a positive integer: ");
          int number = scanner.nextInt();
          // Check for negative number
          if (number < 0) {
            System.out.println("Error: Please enter a positive integer.");
          } else {
            // Reverse and print digits
            System.out.print("Reversed digits: ");
            while (number > 0) {
              int digit = number % 10; // Extract the last digit
              System.out.print(digit);
              number /= 10; // Remove the last digit
            }
          }
          scanner.close();
        }
      }
```

Output:

ProgramSeco... NumberChecke... SumOfNumber... Multiplicati... ReverseDigi...

```
package demo;
import java.util.Scanner;
public class ReverseDigits {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        Scanner scanner = new Scanner(System.in);
        // Get user input for the number
        System.out.print("Enter a positive integer: ");
        int number = scanner.nextInt();
        // Check for negative number
        if (number < 0) {
          System.out.println("Error: Please enter a positive integer.");
        } else {
          // Reverse and print digits
          System.out.print("Reversed digits: ");
          while (number > 0) {
            int digit = number % 10; // Extract the last digit
            System.out.print(digit);
            number /= 10; // Remove the last digit
          }
        }
        scanner.close();
      }
    }
```

Problems Javadoc Declaration Console

```
<terminated> ReverseDigits [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (20-May-2024, 12:18:01 a
Enter a positive integer: 265
Reversed digits: 562
```

8.Create a class Animal with a method makeSound() that prints "Some generic animal sound". Create another class Dog that extends Animal and overrides the makeSound() method to print "Bark". Write a main method to demonstrate calling the makeSound() method on an Animal reference holding a Dog object.

Program:

```
package demo;
class Animal {    //creating class animal
   public void makeSound() {
      System.out.println("Some generic animal sound");
   }
}

class Dog extends Animal {   //Dog class extends Animal
   //Override function
   public void makeSound() {
      System.out.println("Bark");
   }
}

public class method {
   public static void main(String[] args) {
      Animal animal = new Dog();
      animal.makeSound(); // This will call the makeSound() method of the Dog
class
   }
}
```

Output:

```
Bark
```