Level 1 Practice Programs

1. **Write a program to input the Principal, Rate, and Time values and calculate Simple Interest.**

```java
import java.util.Scanner;
public class SimpleInterest {

    public static double calculateSimpleInterest(double principal, double rate, double time) {
        return (principal * rate * time) / 100;
    }

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

        // Input principal
        System.out.print("Enter Principal: ");
        double principal = scanner.nextDouble();

        // Input rate
        System.out.print("Enter Rate of Interest: ");
        double rate = scanner.nextDouble();

        // Input time
        System.out.print("Enter Time: ");
        double time = scanner.nextDouble();

        // Calculate simple interest
        double simpleInterest = calculateSimpleInterest(principal, rate, time);

        // Output the result
        System.out.printf("The Simple Interest is %.2f for Principal %.2f, Rate of Interest %.2f and Time %.2f\n",
                simpleInterest, principal, rate, time);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java SimpleInterest
Enter Principal: 25000
Enter Rate of Interest: 15
Enter Time: 16
The Simple Interest is 60000.00 for Principal 25000.00, Rate of Interest 15.00 and Time 16.00
```

2. **Create a program to find the maximum number of handshakes among N number of students.**

```java
import java.util.Scanner;
public class Handshakes {

    //Method to calculate number of handshakes
    public static int calculation(int n){
        return (n*(n-1))/2;
    }

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

        //Taking user input
        System.out.print("Enter the number of students : ");
        int num = input.nextInt();

        //Printing output
        System.out.println("The total number of handshakes : " +calculation(num));
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac Handshakes.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java Handshakes
Enter the number of students : 12
The total number of handshakes : 66
```

3. **Create a program to find the maximum number of handshakes among N number of students.**

```java
import java.util.Scanner;
public class Handshakes {

    //Method to calculate number of handshakes
    public static int calculation(int n){
        return (n*(n-1))/2;
    }

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

        //Taking user input
        System.out.print("Enter the number of students : ");
        int num = input.nextInt();

        //Printing output
        System.out.println("The total number of handshakes : " +calculation(num));
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac Handshakes.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java Handshakes
Enter the number of students : 12
The total number of handshakes : 66
```

4. **An athlete runs in a triangular park with sides provided as input by the user in meters. If the athlete wants to complete a 5 km run, then how many rounds must the athlete complete.**

```java
import java.util.Scanner;
public class Park {
    public static int Total(int a, int b, int c){
        return 5000/(a+b+c);
    }

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

        System.out.print("Enter the 1st side : ");
        int a = input.nextInt();
        System.out.print("Enter the 2nd side : ");
        int b = input.nextInt();
        System.out.print("Enter the 3rd side : ");
        int c = input.nextInt();

        System.out.println("Rounds needed to cover 5 km : " +Total(a,b,c));
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac Park.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java Park
Enter the 1st side : 5
Enter the 2nd side : 6
Enter the 3rd side : 8
Rounds needed to cover 5 km : 263
```

5. **Write a program to check whether a number is positive, negative, or zero.**

```java
import java.util.Scanner;
public class NatureOfNum {

    //Method to find the nature of number
    public static int check(int n){
        if(n>0){
            return 1;
        } else if (n<0){
            return -1;
        } else{
            return 0;
        }
    }

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

        //Taking user input
        System.out.print("Enter number : ");
        int num = input.nextInt();

        int result = check(num);

        //Conditional Statement
        if(result == 1){
            System.out.println("The number is positive.");
        } else if(result == -1){
            System.out.println("The number is negative.");
        } else{
            System.out.println("The number is zero.");
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac NatureOfNum.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java NatureOfNum
Enter number : 6
The number is positive.
```

6. **Write a program SpringSeason that takes two int values month and day from the command line and prints “Its a Spring Season” otherwise prints “Not a Spring Season”.**

```java
import java.util.Scanner;
public class SpringSeason {
    public static boolean isSpring(int month, int date){
        if((month == 3 && date >= 20 ) ||
            (month == 4) ||
            (month == 5) ||
            (month == 6 && date <= 20)){
                return true;
            }
        else{
            return false;
        }
    }

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

        System.out.print("Enter month : ");
        int month = input.nextInt();

        System.out.print("Enter date : ");
        int date = input.nextInt();

        if(isSpring(month,date)){
            System.out.println("Spring Season.");
        }else{
            System.out.println("Not Spring Season.");
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac SpringSeason.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java SpringSeason
Enter month : 4
Enter date : 12
Spring Season.
```

7. **Write a program to find the sum of n natural numbers using loop.**

```java
import java.util.Scanner;
public class NaturalNumbers {
    public static int findSum(int n) {
        int sum = 0;

        //For loop
        for (int i = 1; i <= n; i++) {
            sum += i;
        }

        return sum;
    }

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

        //Taking user input
        System.out.print("Enter a positive integer: ");
        int number = input.nextInt();

        //Printing output
        if (number <= 0) {
            System.out.println("Please enter a positive number greater than 0.");
        } else {
            int result = findSum(number);
            System.out.println("The sum of first " + number + " natural numbers is: " + result);
        }
    }
}
```

8. **Write a program to find the smallest and the largest of the 3 numbers.**

```java
import java.util.Scanner;
public class SmallandLarge {
    //Method to find smallest and largest among three numbers
    public static int[] findSmallestAndLargest(int number1, int number2, int number3) {
        int smallest = number1;
        int largest = number1;

        //Check for smallest
        if (number2 < smallest) {
            smallest = number2;
        }
        if (number3 < smallest) {
            smallest = number3;
        }

        //Check for largest
        if (number2 > largest) {
            largest = number2;
        }
        if (number3 > largest) {
            largest = number3;
        }

        return new int[]{smallest, largest};
    }

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

        //Taking user input
        System.out.print("Enter first number: ");
        int num1 = input.nextInt();

        System.out.print("Enter second number: ");
        int num2 = input.nextInt();

        System.out.print("Enter third number: ");
        int num3 = input.nextInt();

        int[] result = findSmallestAndLargest(num1, num2, num3);

        //Display results
        System.out.println("Smallest number is: " + result[0]);
        System.out.println("Largest number is: " + result[1]);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac SmallandLarge.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java SmallandLarge
Enter first number: 9
Enter second number: 5
Enter third number: 8
Smallest number is: 5
Largest number is: 9
```

9. **Write a program to take 2 numbers and print their quotient and reminder.**

```java
import java.util.Scanner;
public class QnR {

    //Method to find remainder and quotient
    public static int[] findQnR(int number, int divisor) {
        int quotient = number / divisor;
        int remainder = number % divisor;

        //Return both in an array
        return new int[]{remainder, quotient};
    }

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

        //Take user input
        System.out.print("Enter the number: ");
        int number = input.nextInt();

        System.out.print("Enter the divisor: ");
        int divisor = input.nextInt();

        //Check for zero divisor
        if (divisor == 0) {
            System.out.println("Division by zero is not allowed.");
        } else {
            //Call method to find remainder and quotient
            int[] result = findQnR(number, divisor);

            //Printing output
            System.out.println("Quotient: " + result[1]);
            System.out.println("Remainder: " + result[0]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac QnR.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java QnR
Enter the number: 26
Enter the divisor: 5
Quotient: 5
Remainder: 1
```

10. **Create a program to divide N number of chocolates among M children. Print the number of chocolates each child will get and also the remaining chocolates.**

```java
import java.util.Scanner;
public class Chocolates {

    //Method to find remainder and quotient
    public static int[] findQnR(int number, int divisor) {
        int quotient = number / divisor;
        int remainder = number % divisor;

        //Return both in an array
        return new int[]{remainder, quotient};
    }

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

        //Take user input
        System.out.print("Enter the number of chocolates : ");
        int chocolates = input.nextInt();

        System.out.print("Enter the number of children : ");
        int children = input.nextInt();

        if (children == 0) {
            System.out.println("Number of children cannot be zero.");
        } else {
            int[] result = findQnR(chocolates, children);

            System.out.println("Each child gets: " + result[0] + " chocolates");
            System.out.println("Remaining chocolates: " + result[1]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac Chocolates.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java Chocolates
Enter the number of chocolates : 9
Enter the number of children : 5
Each child gets: 4 chocolates
Remaining chocolates: 1
```

11. **Write a program calculate the wind chill temperature given the temperature and wind speed.**

```java
import java.util.Scanner;
public class TemperatureAndWindSpeed {

    //Method to calculate wind chill based on temperature and wind speed
    public double calculateWindChill(double temperature, double windSpeed) {
        // Formula for calculating wind chill
        double chill = 35.74 + 0.6215 * temperature +
                       (0.4275 * temperature - 35.75) * Math.pow(windSpeed, 0.16);
        return chill;
    }

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

        //Taking user input
        System.out.print("Enter temperature (in Fahrenheit): ");
        double temp = sc.nextDouble();
        System.out.print("Enter wind speed (in mph): ");
        double windSp = sc.nextDouble();

        TemperatureAndWindSpeed wc = new TemperatureAndWindSpeed();

        //Calculating and printing wind chill
        double result = wc.calculateWindChill(temp, windSp);
        System.out.printf("Wind chill: %.2f°F\n", result);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac TemperatureAndWindSpeed.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java TemperatureAndWindSpeed
Enter temperature (in Fahrenheit): 36
Enter wind speed (in mph): 400
Wind chill: 5.01°F
```

12. Write a program to calculate various trigonometric functions using Math class given an angle in degrees.

```java
import java.util.Scanner;
public class Trigonometry {

    //Method to calculate sine, cosine, and tangent of an angle
    public static double[] calculateTrigonometricFunctions(double angle) {
        double radians = Math.toRadians(angle); //Convert degrees to radians

        double sin = Math.sin(radians);
        double cos = Math.cos(radians);
        double tan = Math.tan(radians);

        return new double[]{sin, cos, tan};
    }

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

        //Taking user input
        System.out.print("Enter angle in degrees: ");
        double angle = sc.nextDouble();

        double[] result = calculateTrigonometricFunctions(angle);

        //Display the results
        System.out.printf("Sine(%.2f°)   = %.4f\n", angle, result[0]);
        System.out.printf("Cosine(%.2f°) = %.4f\n", angle, result[1]);
        System.out.printf("Tangent(%.2f°)= %.4f\n", angle, result[2]);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>javac Trigonometry.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 4 - Methods\LEVEL 1>java Trigonometry
Enter angle in degrees: 45
Sine(45.00°)   = 0.7071
Cosine(45.00°) = 0.7071
Tangent(45.00°)= 1.0000
```