CodInClub
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# Best Programming Practice

1. All values as variables including Fixed, User Inputs, and Results
2. Avoid Hard Coding of variables wherever possible
3. Proper naming conventions for all variables

```
String name = "Eric";
double height = input.nextDouble();
double totalDistance = distanceFromToVia + distanceViaToFinalCity;
```

4. Proper Program Name and Class Name
5. Follow proper indentation

1. **Sample Program 1 -** Write a program to display Sam with Roll Number 1, Percent Marks 99.99, and the result 'P' indicates Pass('P') or Fail ('F').

   IMP => Follow Good Programming Practice demonstrated below in all Practice Programs

```
// Creating Class with name DisplayResult indicating the purpose is to display
// result. Notice the class name is a Noun.
class DisplayResult {
    public static void main(String[] args) {

        // Create a string variable name and assign value Sam
        String name = "Sam";

        // Create a int variable rollNumber and assign value 1
        int rollNumber = 1;

        // Create a double variable percentMarks and assign value 99.99
        double percentMarks = 99.99;

        // Create a char variable result and assign value 'P' for pass
        char result = 'P';

        // Display the result
        System.out.println("Displaying Result:\n" +name+ " with Roll Number " +
                           rollNumber+ " has Scored " +percentMarks+
                           "% Marks and Result is " +result);
    }
}
```

2. **Sample Program 2 -** Eric Travels from Chennai to Bangalore via Vellore. From Chennai to Vellore distance is 156.6 km and the time taken is 4 Hours 4 Mins and from Vellore to Bangalore is 211.8 km and will take 4 Hours 25 Mins. Compute the total distance and total time from Chennai to Bangalore

```java
// Create TravelComputation Class to compute the Distance and Travel Time
class TravelComputation {

   public static void main(String[] args) {

      // Create a variable name to indicate the person traveling
      String name = "Eric";

      // Create a variable fromCity, viaCity and toCity to indicate the city
      // from city, via city and to city the person is travelling
      String fromCity = "Chennai", viaCity = "Velore", toCity = "Bangalore";

      // Create a variable distanceFromToVia to indicate the distance
      // between the fromCity to viaCity
      double distanceFromToVia = 156.6;

      // Create a variable timeFromToVia to indicate the time taken to
      // travel from fromCity to viaCity in minutes
      int timeFromToVia = 4 * 60 + 4;

      // Create a variable distanceViaToFinalCity to indicate the distance
      // between the viaCity to toCity
      double distanceViaToFinalCity = 211.8;

      // Create a variable timeViaToFinalCity to indicate the time taken to
      // travel from viaCity to toCity in minutes
      int timeViaToFinalCity = 4 * 60 + 25;

      // Create a variable totalDistance to indicate the total distance
      // between the fromCity to toCity
      double totalDistance = distanceFromToVia + distanceViaToFinalCity;

      // Create a variable totalTime to indicate the total time taken to
      // travel from fromCity to toCity in minutes
      int totalTime = timeFromToVia + timeViaToFinalCity;


      // Print the travel details
      System.out.println("The Total Distance travelled by " + name + " from " +
                         fromCity + " to " + toCity + " via " + viaCity +
                         " is " + totalDistance + " km and " +
                         "the Total Time taken is " + totalTime + " minutes");
   }
}
```

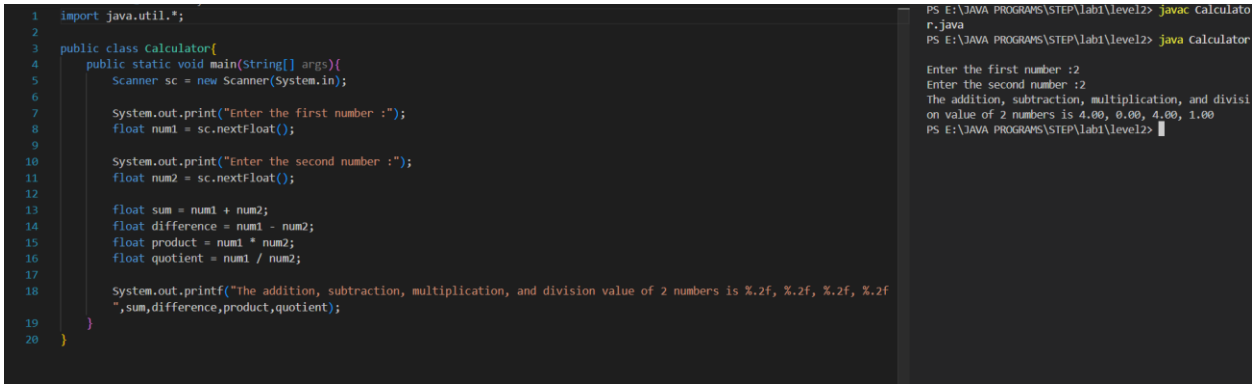
# Level 2 Practice Programs

1. Write a program to create a basic calculator that can perform addition, subtraction, multiplication, and division. The program should ask for two numbers (floating point) and perform all the operations

   **Hint =>**

   a. Create a variable number1 and number 2 and take user inputs.
   b. Perform Arithmetic Operations of addition, subtraction, multiplication and division and assign the result to a variable and finally print the result

   **I/P =>** number1, number2
   **O/P =>** The addition, subtraction, multiplication and division value of 2 numbers ___ and ___ is ___, ____, ____, and ___



```java
import java.util.*;

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

        System.out.print("Enter the first number :");
        float num1 = sc.nextFloat();

        System.out.print("Enter the second number :");
        float num2 = sc.nextFloat();

        float sum = num1 + num2;
        float difference = num1 - num2;
        float product = num1 * num2;
        float quotient = num1 / num2;

        System.out.printf("The addition, subtraction, multiplication, and division value of 2 numbers is %.2f, %.2f, %.2f, %.2f
        ",sum,difference,product,quotient);
    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac Calculato
r.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java Calculator

Enter the first number :2
Enter the second number :2
The addition, subtraction, multiplication, and divisi
on value of 2 numbers is 4.00, 0.00, 4.00, 1.00
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

2. Write a program that takes the base and height to find area of a triangle in square inches and square centimeters

   **Hint =>** Area of a Triangle is ½ * base * height

   **I/P =>** base, height

   **O/P =>** Your Height in cm is ___ while in feet is ___ and inches is ___

```java
import java.util.*;

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

        // Conversion constants
        double inchToCm = 2.54;
        double cmToFeet = 0.032;
        double cmToInches = 0.393;

        // Taking inputs
        System.out.print("Enter the base in cm: ");
        double baseCm = sc.nextDouble();

        System.out.print("Enter the height in cm: ");
        double heightCm = sc.nextDouble();

        // Calculating area
        double areaCm = 0.5 * baseCm * heightCm;
        double areaIn = 0.5 * (baseCm / inchToCm) * (heightCm / inchToCm);

        // Converting height to feet and inches
        double heightFeet = heightCm * cmToFeet;
        double heightInches = heightCm * cmToInches;

        // Printing results
        System.out.printf("The area of the triangle is %.2f sq cm and %.2f sq in.\n", areaCm, areaIn);
        System.out.printf("Your height in cm is %.2f, in feet is %.2f, and in inches is %.2f.\n", heightCm, heightFeet, heightInch
    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac AreaOfTri
angle.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java AreaOfTria
ngle
Enter the base in cm: 10
Enter the height in cm: 5
The area of the triangle is 25.00 sq cm and 3.88 sq i
n.
Your height in cm is 5.00, in feet is 0.16, and in in
ches is 1.97.
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

3. Write a program to find the side of the square whose parameter you read from user

   **Hint =>** Perimeter of Square is 4 times side

   **I/P =>** perimeter

   **O/P =>** The length of the side is ___ whose perimeter is ____

```java
import java.util.*;

public class PerimeterOfSquare{
    public static void main(String[] args){

        // Using Scanner to take the input
        Scanner sc = new Scanner ( System.in);

        // Taking the Input
        System.out.print("Enter the side length :");
        int side = sc.nextInt();

        int perimeter = 4 * side; //Calculating the Perimeter

        // Displaying the output
        System.out.printf("The length of the side is %d whose perimeter is %d",side,perimeter);
    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac Perimeter
OfSquare.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java PerimeterO
fSquare
Enter the side length :45
The length of the side is 45 whose perimeter is 180
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

4. Write a program the find the distance in yards and miles for the distance provided by user in feets

   **Hint =>** 1 mile = 1760 yards and 1 yard is 3 feet

   **I/P =>** distanceInFeet

**O/P =>** Your Height in cm is ___ while in feet is ___ and inches is ___

```java
import java.util.*;

public class Converter{
    public static void main(String[] args){

        // Using the Scanner to take the input under the alias sc
        Scanner sc = new Scanner(System.in);

        // Initialised varibles for conversion
        double yardFeet = 1.0/3;
        double yardMiles = 1.0/1760;

        // Prompting the user to give the input
        System.out.print("Enter the Distance in feet :");
        double distanceInFeet = sc.nextDouble();

        // Conversion in yard and miles
        double distanceInYard = yardFeet * distanceInFeet;
        double distanceInMiles = yardMiles * distanceInYard;

        // Displaying the ouput
        System.out.print("Distance in yard is "+distanceInYard);
        System.out.print("Distance in Miles is "+distanceInMiles);
    }

}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac PerimeterOfSquare.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java PerimeterOfSquare
Enter the side length :45
The length of the side is 45 whose perimeter is 180
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

5. Write a program to input the unit price of an item and the quantity to be bought. Then, calculate the total price.

   **Hint =>** NA

   **I/P =>** unitPrice, quantity

   **O/P =>** The total purchase price is INR ___ if the quantity ___ and unit price is INR ___

```java
import java.util.*;

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

        System.out.print("Enter the price for 1 unit :");
        int unitPrice = sc.nextInt();

        System.out.print("Enter the Quantity :");
        int quantity = sc.nextInt();

        int totalBill = unitPrice * quantity;
        System.out.printf("The total purchase price is INR %d if the quantity %d and unit price is INR %d",totalBill,quantity,unit

    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac BillCalculator.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java BillCalculator
Enter the price for 1 unit :45
Enter the Quantity :10
The total purchase price is INR 450 if the quantity 10 and unit price is INR 45
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

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

   **Hint =>** Use division operator (/) for quotient and moduli operator (%) for reminder

   **I/P =>** number1, number2

**O/P =>** The Quotient is ___ and Reminder is ___ of two number ___ and ___

```java
import java.util.Scanner;

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

        // Taking input
        System.out.print("Enter the first number: ");
        int number1 = sc.nextInt();

        System.out.print("Enter the second number: ");
        int number2 = sc.nextInt();

        // Calculating quotient and remainder
        int quotient = number1 / number2;
        int remainder = number1 % number2;

        // Printing the result
        System.out.println("The Quotient is " + quotient + " and Remainder is " + remainder +
                " of two numbers " + number1 + " and " + number2);

    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac DivisionOperations.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java DivisionOperations
Enter the first number: 74
Enter the second number: 25
The Quotient is 2 and Remainder is 24 of two numbers 74 and 25
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

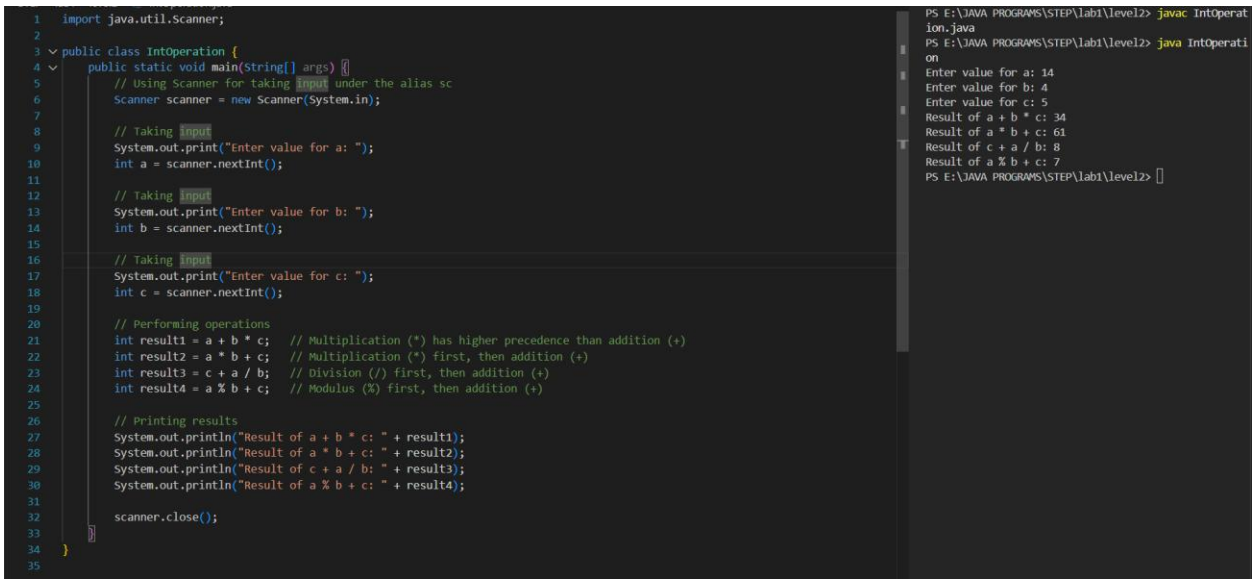
7. Write an ***IntOperation*** program by taking a, b, and c as input values and print the following integer operations a + b *c, a * b + c, c + a / b, and a % b + c. Please also understand the precedence of the operators.

   **Hint =>**

   a. Create variables a, b, c of int data type.
   b. Take user input for a, b, and c.
   c. Compute 3 integer operations and assign the result to a variable
   d. Finally, print the result and try to understand operator precedence.

   **I/P =>** fee, discountPrecent

   **O/P =>** The results of Int Operations are —-, -—, and —-



```java
import java.util.Scanner;

public class IntOperation {
    public static void main(String[] args) {
        // Using Scanner for taking input under the alias sc
        Scanner scanner = new Scanner(System.in);

        // Taking input
        System.out.print("Enter value for a: ");
        int a = scanner.nextInt();

        // Taking input
        System.out.print("Enter value for b: ");
        int b = scanner.nextInt();

        // Taking input
        System.out.print("Enter value for c: ");
        int c = scanner.nextInt();

        // Performing operations
        int result1 = a + b * c;   // Multiplication (*) has higher precedence than addition (+)
        int result2 = a * b + c;   // Multiplication (*) first, then addition (+)
        int result3 = c + a / b;   // Division (/) first, then addition (+)
        int result4 = a % b + c;   // Modulus (%) first, then addition (+)

        // Printing results
        System.out.println("Result of a + b * c: " + result1);
        System.out.println("Result of a * b + c: " + result2);
        System.out.println("Result of c + a / b: " + result3);
        System.out.println("Result of a % b + c: " + result4);

        scanner.close();
    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac IntOperation.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java IntOperation
Enter value for a: 14
Enter value for b: 4
Enter value for c: 5
Result of a + b * c: 34
Result of a * b + c: 61
Result of c + a / b: 8
Result of a % b + c: 7
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```

8. Similarly, write the ***DoubleOpt*** program by taking double values and doing the same operations.

```java
import java.util.*;

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

        // Taking input
        System.out.print("Enter value for a (double): ");
        double a = sc.nextDouble();

        System.out.print("Enter value for b (double): ");
        double b = sc.nextDouble();

        System.out.print("Enter value for c (double): ");
        double c = sc.nextDouble();

        // Performing operations
        double result1 = a + b * c;   // Multiplication (*) has higher precedence than addition (+)
        double result2 = a * b + c;   // Multiplication (*) first, then addition (+)
        double result3 = c + a / b;   // Division (/) first, then addition (+)
        double result4 = a % b + c;   // Modulus (%) first, then addition (+)

        // Printing results
        System.out.println("Result of a + b * c: " + result1);
        System.out.println("Result of a * b + c: " + result2);
        System.out.println("Result of c + a / b: " + result3);
        System.out.println("Result of a % b + c: " + result4);

    }
}
```

```
PS E:\JAVA PROGRAMS\STEP\lab1\level2> javac DoubleOpt
.java
PS E:\JAVA PROGRAMS\STEP\lab1\level2> java DoubleOpt
Enter value for a (double): 45
Enter value for b (double): 25
Enter value for c (double): 5
Result of a + b * c: 170.0
Result of a * b + c: 1130.0
Result of c + a / b: 6.8
Result of a % b + c: 25.0
PS E:\JAVA PROGRAMS\STEP\lab1\level2>
```