CodInClub

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Best Programming Practice All values as variables including Fixed, User Inputs, and Results

1. Avoid Hard Coding of variables wherever possible
2. Proper naming conventions for all variables

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

3. Proper Program Name and Class Name
4. 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

Java

```
// 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 and 4 Mins and from Vellore to Bangalore is 211.8 km and will take 4 Hours and 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 1 Practice Programs

1. Write a program to find the age of Harry if the birth year is 2000. Assume the Current Year is 2024

   I/P => NONE

   O/P => Harry's age in 2024 is ___

   Code:

```
public class age {
    public static void main(String[] args) {
        int birth = 2000;
        int current = 2024;
        System.out.println("Harry's age in 2024 is: " + (current - birth));
    }
}
```

   Output:

   Harry's age in 2024 is: 24

2. Sam's mark in Maths is 94, Physics is 95 and Chemistry is 96 out of 100. Find the average percent mark in PCM

   I/P => NONE

   O/P => Sam's average mark in PCM is ___

   Code:

```
public class marks {
    public static void main(String[] args) {
        int maths = 94;
        int physics = 95;
        int chem = 96;

         int avg = (maths+physics+chem)/3;
        System.out.println("Sam's average mark in PCM is : " + avg);
    }
}
```

   Output:

Sam's average mark in PCM is : 95

3. Create a program to convert the distance of 10.8 kilometers to miles.

   Hint: 1 km = 1.6 miles

   I/P => NONE

   O/P => The distance ___ km in miles is ___

   Code:

```
public class conv {
    public static void main(String[] args) {
        double km = 10.6;
        double miles = km * 1.6;
        System.out.println("The distance " + km + " Km in miles is: " +
miles);
    }
}
```

   Output:

   The distance 10.6 Km in miles is: 16.96

4. Create a program to calculate the profit and loss in number and percentage based on the cost price of INR 129 and the selling price of INR 191.

   Hint =>

   a. Use a single print statement to display multiline text and variables.
   b. Profit = selling price - cost price
   c. Profit Percentage = profit / cost price * 100

   I/P => NONE

   O/P =>

   The Cost Price is INR ___ and Selling Price is INR ___

   The Profit is INR ___ and the Profit Percentage is ___\

   Code:

```
public class profit {
    public static void main(String[] args) {
        double cp = 129;
```

```
        double sp = 191;
        double profit = sp - cp;
        double perc = (profit/cp) * 100;
        System.out.println("The Cost Price is INR " + cp + "  and Selling
Price is INR " + sp + " The Profit is INR " + profit +  " and the Profit
Percentage is " + perc);
    }
}
```

Output:

The Cost Price is INR 129.0 and Selling Price is INR 191.0 The Profit is INR 62.0 and the Profit Percentage is 48.06201550387597

5. Suppose you have to divide 14 pens among 3 students equally. Write a program to find how many pens each student will get if the pens must be divided equally. Also, find the remaining non-distributed pens.

   Hint =>

   a. Use Modulus Operator (%) to find the reminder.
   b. Use Division Operator to find the Quantity of pens

   I/P => NONE

   O/P => The Pen Per Student is ___ and the remaining pen not distributed is ___

   Code:

```
public class pen {
    public static void main(String[] args) {
        int pen = 14;
        int stud = 3;
        int remain = pen % stud;
        int pend = (pen - remain)/stud;
        System.out.println("The Pen Per Student is " + pend + " and the
remaining pen not distributed is " + remain);
    }
}
```

Output:

The Pen Per Student is 4 and the remaining pen not distributed is 2

6. The University is charging the student a fee of INR 125000 for the course. The University is willing to offer a discount of 10%. Write a program to find the discounted amount and discounted price the student will pay for the course.

Hint =>

a. Create a variable named fee and assign 125000 to it.
b. Create another variable discountPercent and assign 10 to it.
c. Compute discount and assign it to the discount variable.
d. Compute and print the fee you have to pay by subtracting the discount from the fee.

O/P => The discount amount is INR ___ and final discounted fee is INR ___

Code:

```
public class disc {
    public static void main(String[] args) {
        int fee = 125000;
        int discountPercent = 10;
        int disc = (125000*10)/100;
        int discfee = fee - disc;
        System.out.println("The discount amount is INR " + disc + " and
final discounted fee is INR " + discfee);
    }
}
```

Output:

The discount amount is INR 12500 and final discounted fee is INR 112500

7. Write a Program to compute the volume of Earth in km^3 and miles^3

Hint => Volume of a Sphere is (4/3) * pi * r^3 and radius of earth is 6378 km

O/P => The volume of earth in cubic kilometers is ____ and cubic miles is ____

Code:

```
public class vol {
    public static void main(String[] args) {
        int r = 6378;
        double pi = 22.7;
        double volkm = ((4/3) * pi * Math.pow(r,3));
        double mil = r * 0.62;
        double volmi = ((4/3) * pi * Math.pow(mil, 3));
        System.out.println("The volume of earth in cubic kilometers is " +
volkm + " and cubic miles is " + volmi);
    }
}
```

Output:

The volume of earth in cubic kilometers is 5.889513232850399E12 and cubic miles is 1.4036359097587703E12

8. Create a program to convert distance in kilometers to miles.

   Hint =>

   a. Create a variable km and assign type as double as in `double km;`
   b. Create `Scanner` Object to take user input from Standard Input that is the Keyboard as in `Scanner input = new Scanner(System.in);`
   c. Use `Scanner` Object to take user input for km as in `km = input.nextInt();`
   d. Use 1 mile = 1.6 km formulae to calculate miles and show the output

   I/P => km
   O/P => The total miles is ___ mile for the given ___ km

   Code:

```
import java.util.Scanner;
public class vol {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int km = input.nextInt();
        double miles = km*1.6;
        System.out.println("The total miles is " + miles + " mile for the
given " + km + " km");
    }
}
```

   Output:

   The total miles is 16.0 mile for the given 10 km

9. Write a new program similar to the program # 6 but take user input for Student Fee and University Discount

   Hint =>

   a. Create a variable named fee and take user input for fee.
   b. Create another variable discountPercent and take user input.
   c. Compute the discount and assign it to the discount variable.
   d. Compute and print the fee you have to pay by subtracting the discount from the fee.

   I/P => fee, discountPrecent
   O/P => The discount amount is INR ___ and final discounted fee is INR ___

   Code:

```java
import java.util.Scanner;

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

        System.out.print("Enter the student fee (INR): ");
        double fee = scanner.nextDouble();

        System.out.print("Enter the university discount percentage: ");
        double discountPercent = scanner.nextDouble();

        double discount = (fee * discountPercent) / 100;

        double finalFee = fee - discount;

        System.out.println("The discount amount is INR " + discount + " and
final discounted fee is INR " + finalFee);

        scanner.close();
    }
}
```

Output:

Enter the student fee (INR): 50000

Enter the university discount percentage: 10

The discount amount is INR 5000.0 and final discounted fee is INR 45000.0

10. Write a program that takes your height in centimeters and converts it into feet and inches

    Hint => 1 foot = 12 inches and 1 inch = 2.54 cm

    I/P => height

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

    Code:

```java
import java.util.Scanner;

public class HeightConverter {
```

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

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

        double totalInches = heightCm / 2.54;
        int feet = (int) (totalInches / 12);
        double inches = totalInches % 12;

        System.out.println("Your Height in cm is " + heightCm + " while in
feet is " + feet + " and inches is " + inches);

        scanner.close();
    }
}
```

Output:

Enter your height in cm: 170

Your Height in cm is 170.0 while in feet is 5 and inches is 6.929133858267717

11. 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 ___

    Code:

```
import java.util.Scanner;

public class BasicCalculator {
```

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

        System.out.print("Enter the first number: ");
        double number1 = scanner.nextDouble();

        System.out.print("Enter the second number: ");
        double number2 = scanner.nextDouble();

        double addition = number1 + number2;
        double subtraction = number1 - number2;
        double multiplication = number1 * number2;
        double division = number2 != 0 ? number1 / number2 :
Double.POSITIVE_INFINITY;

        System.out.println("The addition, subtraction, multiplication and
division value of 2 numbers " + number1 + " and " + number2 + " is " +
addition + ", " + subtraction + ", " + multiplication + ", and " +
division);

        scanner.close();
    }
}
```

Output:

Enter the first number: 10.5

Enter the second number: 2.5

The addition, subtraction, multiplication and division value of 2 numbers 10.5 and 2.5 is 13.0, 8.0, 26.25, and 4.2

10. 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 ___

    Code:

```
import java.util.Scanner;

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

        System.out.print("Enter the base of the triangle (cm): ");
        double base = scanner.nextDouble();

        System.out.print("Enter the height of the triangle (cm): ");
        double height = scanner.nextDouble();

        double areaCm = 0.5 * base * height;
        double areaInches = areaCm / 6.4516;

        System.out.println("The area of the triangle is " + areaCm + "
square cm and " + areaInches + " square inches.");

        scanner.close();
    }
}
```

Output:

Enter the base of the triangle (cm): 10

Enter the height of the triangle (cm): 5

The area of the triangle is 25.0 square cm and 3.875969 square inches.

11. 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 ____

    Code:

```
import java.util.Scanner;

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

```
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the perimeter of the square: ");
        double perimeter = scanner.nextDouble();

        double side = perimeter / 4;

        System.out.println("The length of the side is " + side + " whose
perimeter is " + perimeter);

        scanner.close();
    }
}
```

Output:

Enter the perimeter of the square: 20

The length of the side is 5.0 whose perimeter is 20.0

12. 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 ___

    Code:

```
import java.util.Scanner;

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

        System.out.print("Enter the distance in feet: ");
        double distanceInFeet = scanner.nextDouble();

        double distanceInYards = distanceInFeet / 3;
        double distanceInMiles = distanceInYards / 1760;

        System.out.println("The distance in feet is " + distanceInFeet + "
```

```
which is " + distanceInYards + " yards and " + distanceInMiles + "
miles.");

        scanner.close();
    }
}
```

Output:

Enter the distance in feet: 5280

The distance in feet is 5280.0 which is 1760.0 yards and 1.0 miles.

15. 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 ___

Code:

```
 import java.util.Scanner;

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

        System.out.print("Enter the unit price of the item (INR): ");
        double unitPrice = scanner.nextDouble();

        System.out.print("Enter the quantity to be bought: ");
        int quantity = scanner.nextInt();

        double totalPrice = unitPrice * quantity;

        System.out.println("The total purchase price is INR " + totalPrice
+ " if the quantity is " + quantity + " and unit price is INR " +
unitPrice);

        scanner.close();
```

```
    }
}
```

Output:

Enter the unit price of the item (INR): 50

Enter the quantity to be bought: 3

The total purchase price is INR 150.0 if the quantity is 3 and unit price is INR 50.0

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

    Hint =>

    a. Get integer input for numberOfStudents variable.
    b. Use the combination = (n * (n - 1)) / 2 formula to calculate the maximum number of possible handshakes.
    c. Display the number of possible handshakes.

Code:

```
import java.util.Scanner;

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

        System.out.print("Enter the number of students: ");
        int numberOfStudents = scanner.nextInt();

        int maxHandshakes = (numberOfStudents * (numberOfStudents - 1)) /
2;

        System.out.println("The maximum number of handshakes among " +
numberOfStudents + " students is " + maxHandshakes);

        scanner.close();
    }
}
```

Output:

Enter the number of students: 5

The maximum number of handshakes among 5 students is 10