

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

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);  
    }  
}
```

- 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 = "Vellore", 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 ____

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 ____

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 ____

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 ____

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 ____

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 =>

- Create a variable named fee and assign 125000 to it.
- Create another variable discountPercent and assign 10 to it.
- Compute discount and assign it to the discount variable.
- 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 ____

7. Write a Program to compute the volume of Earth in km³ and miles³

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 ____

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

Hint =>

- Create a variable km and assign type as double as in `double km;`
- Create `Scanner` Object to take user input from Standard Input that is the Keyboard as in `Scanner input = new Scanner(System.in);`
- Use `Scanner` Object to take user input for km as in `km = input.nextInt();`
- 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

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

Hint =>

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

I/P => fee, discountPercent

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

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 ____

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 ____

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 $\frac{1}{2} * \text{base} * \text{height}$

I/P => base, height

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

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 ____

12. Write a program the find the distance in yards and miles for the distance provided by user in feet

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 ____

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 ____

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.