CodInClub

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Best Programming Practice

1. All values as variables including Fixed, User Inputs, and Results
2. Proper naming conventions for all variables
3. Proper Program Name and Class Name
4. Proper Method Name which indicates action taking inputs and providing result

Sample Program 1: Create a program to find the sum of all the digits of a number given by a user using an array and display the sum.

a. Use Math.random() and get a 4-digit random integer number
b. Write a method to count digits in the number
c. Write a method to return an array of digits from a given number.
d. Write a method to Find the sum of the digits of the number in the array
e. Finally, display the sum of the digits of the number

Java

```java
// Create SumOfDigit Class to compute the sum of 4 digits random number
class SumOfDigits {
   // Get a 4 digit random number
   public int get4DigitRandomNumber() {
      return (int) (Math.random() * 9000) + 1000;
   }

   // Find the count of digits in the number
   public int countDigits(int number) {
      int count = 0, temp = number;
      while (temp > 0) {
         count++;
         temp /= 10;
      }
      return count;
   }

   // Store the digits of the number in an array
   public int[] getDigits(int number, int count) {
      int[] digits = new int[count];
      int temp = number;
      for (int i = count - 1; i >= 0; i--) {
         digits[i] = temp % 10;
         temp /= 10;
      }
      return digits;
   }
```

```
    // Find the sum of the elements in an array
    public int sumArray(int[] array) {
        int sum = 0;
        for (int i = 0; i < array.length; i++) {
            sum += array[i];
        }
        return sum;
    }

    public static void main(String[] args) {
        // Get 4 digit random integer number
        SumOfDigits sumOfDigits = new SumOfDigits();
        int number = sumOfDigits.get4DigitRandomNumber();
        System.out.println("The Random Mumber is: " + number);

        // Get the count of digits
        int count = sumOfDigits.countDigits(number);
        System.out.println("The count of digit is: " + count);

        // Get the array of digits from the number
        int[] digits = sumOfDigits.getDigits(number, count);

        // Find the sum of the digits of the number
        int sum = sumOfDigits.sumArray(digits);

        // Display the sum of the digits of the number
        System.out.println("\nSum of Digits: " + sum);
    }
}
```

Level 1 Practice Programs

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

   Hint =>

   a. Simple Interest = Principal * Rate * Time / 100
   b. Take user input for principal, rate, time
   c. Write a method to calculate the simple interest given principle, rate and time as parameters
   d. Output “The Simple Interest is ___ for Principal ___, Rate of Interest ___ and Time ___”

```java
package Day4.LabPractice_L1;

import java.util.Scanner;

public class LP1 {

   public static double calculateSI(double principal, double rate, double time){

        return (principal * rate * time) / 100;

   }


   public static void main(String[] args){

        Scanner input = new Scanner(System.in);

        System.out.print("Principal: ");

        double principal = input.nextDouble();

        System.out.print("Rate: ");

        double rate = input.nextDouble();

        System.out.print("Time: ");

        double time = input.nextDouble();

        double SI = calculateSI(principal, rate, time);

        System.out.println("The Simple Interest is " + SI + " for Principal " + principal + ", Rate of Interest " + rate + " and Time " + time);

        input.close();

   }

}
```

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

Hint =>

a. Get integer input for number of students
b. Use the combination = (n * (n - 1)) / 2 formula to calculate the maximum number of possible handshakes.
c. Write a method to use the combination formulae to calculate the number of handshakes

```
package Day4.LabPractice_L1;

import java.util.Scanner;

public class LP2 {

   public static int handshakes(int n){

       return  (n * (n - 1)) / 2;

   }


   public  static void main(String[] args){

       Scanner input = new Scanner(System.in);

       System.out.print("Number: ");

       int n = input.nextInt();

       int noOfHandshakes = handshakes(n);

       System.out.println("Handshakes: " + noOfHandshakes);

       input.close();

   }

}
```

3. 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.

```
package Day4.LabPractice_L1;

import java.util.Scanner;

public class LP3 {

   public static int handshakes(int n){

       return  (n * (n - 1)) / 2;
```

```
    }


    public  static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Number: ");
        int n = input.nextInt();
        int noOfHandshakes = handshakes(n);
        System.out.println("Handshakes: " + noOfHandshakes);
        input.close();
    }
}
```

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

   Hint =>

   a. Take user input for 3 sides of a triangle
   b. The perimeter of a triangle is the addition of all sides and rounds is distance/perimeter
   c. Write a Method to compute the number of rounds user needs to do to complete 5km run

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP4 {
    public static int calcRounds(int a, int b, int c){
        int perimeter = a + b + c;
        return (5000 / perimeter);
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Side A: ");
        int a = input.nextInt();
        System.out.print("Side B: ");
        int b = input.nextInt();
        System.out.print("Side C: ");
        int c = input.nextInt();
```

```
        if (a + b > c && b + c > a && a + c > b){
            int rounds = calcRounds(a, b, c);
            System.out.println("Rounds: " + rounds);
        }
        else{
            System.out.println("Enter valid Triangle Sides!");
        }
        input.close();
    }
}
```

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

   Hint => Get integer input from the user. Write a Method to return -1 for negative number, 1 for positive number and 0 if number is zero

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP5 {
    public static int checkNumber(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);
        System.out.print("Number: ");
        int n = input.nextInt();
        int result = checkNumber(n);
        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");
        }
        input.close();
    }
}
```

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”.

   Hint => Spring Season is from March 20 to June 20. Write a Method to check for Spring season and return a boolean true or false

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP6 {
   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("Month: ");
       int month = input.nextInt();
       System.out.print("Date: ");
       int date = input.nextInt();
       boolean result = isSpring(month, date);
       if(result){
           System.out.println("Spring Season");
       }
       else {
           System.out.println("Not a Spring Season");
       }
       input.close();
   }

}
```

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

   Hint => Get integer input from the user. Write a Method to find the sum of n natural numbers using loop

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP7 {
   public static int sumOfNaturalNumbers(int n){
       int sum = 0;
       for(int i = 1; i <= n; i++){
           sum += i;
```

```
        }
        return sum;
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Number: ");
        int n = input.nextInt();
        int result = sumOfNaturalNumbers(n);
        System.out.println("Sum of " + n + " Natural Numbers is: " + result);
        input.close();
    }
}
```

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

   Hint =>

   a. Take user input for 3 numbers
   b. Write a single method to find the smallest and largest of the three numbers

      public static int[] findSmallestAndLargest(int number1, int number2, int number3)

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP8 {
    public static int[] findSmallestAndLargest(int number1, int number2, int
number3){
        int smallest = Math.min(number1, Math.min(number2, number3));
        int largest = Math.max(number1, Math.max(number2, number3));
        return new int[]{smallest, largest};
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter first number: ");
        int number1 = input.nextInt();
        System.out.print("Enter second number: ");
        int number2 = input.nextInt();
        System.out.print("Enter third number: ");
        int number3 = input.nextInt();
        int[] result = findSmallestAndLargest(number1, number2, number3);
        System.out.println("Smallest Number: " + result[0]);
        System.out.println("Largest Number: " + result[1]);
        input.close();
    }
}
```

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

Hint =>

a. Take user input as integer
b. Use division operator (/) for quotient and moduli operator (%) for reminder
c. Write Method to find the reminder and the quotient of a number

public static int[] findRemainderAndQuotient(int number, int divisor)

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP9 {
   public static int[] findRemainderAndQuotient(int number, int
divisor){
        int quotient = number / divisor;
        int remainder = number % divisor;
        return new int[]{quotient, remainder};
   }
   public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Number: ");
        int number = input.nextInt();
        System.out.print("Divisor: ");
        int divisor = input.nextInt();
        int[] result = findRemainderAndQuotient(number, divisor);
        System.out.println("Quotient: " + result[0]);
        System.out.println("Remainder: " + result[1]);
        input.close();
   }
}
```

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

Hint =>

a. Get an integer value from user for the numberOfchocolates and numberOfChildren.
b. Write the method to find the number of chocolates each child gets and number of remaining chocolates

public static int[] findRemainderAndQuotient(int number, int divisor)

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP10 {
   public static int[] findRemainderAndQuotient(int number, int
divisor){
```

```
        return new int[]{number / divisor, number % divisor};
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the number of chocolates: ");
        int numberOfChocolates = input.nextInt();
        System.out.print("Enter the number of children: ");
        int numberOfChildren = input.nextInt();
        int[] result = findRemainderAndQuotient(numberOfChocolates,
numberOfChildren);
        System.out.println("Each child will get " + result[0] + "
chocolates.");
        System.out.println("Remaining chocolates: " + result[1]);
        input.close();
    }
}
```

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

Hint =>

a. Write a method to calculate the wind chill temperature using the formula

$$windChill = 35.74 + 0.6215 * temp + (0.4275 * temp - 35.75) * windSpeed^{0.16}$$

public double calculateWindChill(double temperature, double windSpeed)

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP11 {
    public static double calculateWindChill(double temperature, double
windSpeed){
        return 35.74 + (0.6215 * temperature) + ((0.4275 * temperature -
35.75) * Math.pow(windSpeed, 0.16));
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the temperature: ");
        double temperature = input.nextDouble();
        System.out.print("Enter the wind speed: ");
        double windSpeed = input.nextDouble();
        if (temperature > 50 || windSpeed <= 3) {
            System.out.println("Wind chill formula is applicable only if
temperature is ≤ 50°F and wind speed is > 3 mph.");
        } else {
```

```
            double windChill = calculateWindChill(temperature, windSpeed);
            System.out.printf("The wind chill temperature is: %.2f°F%n",
windChill);
        }
        input.close();
    }

}
```

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

    Hint =>

    a. Method to calculate various trigonometric functions, Firstly convert to radians and then use Math function to find sine, cosine and tangent.

    public double[] calculateTrigonometricFunctions(double angle)

```
package Day4.LabPractice_L1;
import java.util.Scanner;
public class LP12 {
    public static double[]
calculateTrigonometricFunctions(double angle) {
        double radians = Math.toRadians(angle);
        double sinValue = Math.sin(radians);
        double cosValue = Math.cos(radians);
        double tanValue = Math.tan(radians);
        return new double[]{sinValue, cosValue, tanValue};
    }
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the angle in degrees: ");
        double angle = input.nextDouble();
        double[] trigValues =
calculateTrigonometricFunctions(angle);
        System.out.printf("Sin(%.2f°) = %.4f%n", angle,
trigValues[0]);
        System.out.printf("Cos(%.2f°) = %.4f%n", angle,
trigValues[1]);
        System.out.printf("Tan(%.2f°) = %.4f%n", angle,
```

```
trigValues[2]);
        input.close();
    }
}
```