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

```
// 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 ___”

```
import java.util.Scanner;


public class EmployeeBonus {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                  double
Principle=input.nextDouble(),Rate=input.nextDouble(),Time=input.nextDouble();


                  System.out.printf("The Simple Interest is %.3f for Principal %.3f, Rate of Interest
%.3f and Time %.3f ", SimpleInterest(Principle,Rate,Time), Principle, Rate, Time);


   }


      public static double SimpleInterest(double P, double R, double T){


                  return (P*T*R)/100;
      }
}
```

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

```
import java.util.Scanner;


public class EmployeeBonus {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                int num=input.nextInt();


                System.out.println(MaxCombinations(num));


   }


        public static int MaxCombinations(int n){


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

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.

```
import java.util.Scanner;


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

```
        Scanner input = new Scanner(System.in);
                int num=input.nextInt();

                System.out.println(MaxCombinations(num));

    }

        public static int MaxCombinations(int n){

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

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

```
import java.util.Scanner;

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

        System.out.print("Enter the length of side 1 (in meters): ");
        double side1 = input.nextDouble();

        System.out.print("Enter the length of side 2 (in meters): ");
        double side2 = input.nextDouble();
```

```
        System.out.print("Enter the length of side 3 (in meters): ");
        double side3 = input.nextDouble();

        int rounds = calculateRounds(side1, side2, side3);

        if (rounds > 0) {
            System.out.println("The athlete needs to complete " + rounds + " rounds to run 5 km.");
        } else {
            System.out.println("Invalid triangle sides! Please enter valid lengths.");
        }

        input.close();
    }

    public static int calculateRounds(double side1, double side2, double side3) {
        double perimeter = side1 + side2 + side3;
        if (side1 <= 0 || side2 <= 0 || side3 <= 0 || (side1 + side2 <= side3) || (side1 + side3 <= side2) || (side2 + side3 <= side1)) {
            return -1; // Invalid triangle
        }

        double totalDistance = 5000; // 5 km = 5000 meters
        return (int) Math.ceil(totalDistance / perimeter);
    }
}
```

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

```
import java.util.Scanner;
```

```
public class EmployeeBonus {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
            int num=input.nextInt();

            System.out.println(CheckNo(num));

   }

     public static String CheckNo(int n){

            if (n<0){
                  return "Negative";
            }
            else if(n>0){
                  return "Positive";
            }
            else {
                  return "0";
            }
     }
}
```

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

```
import java.util.Scanner;

public class EmployeeBonus {

   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
            int day=input.nextInt(),month=input.nextInt();

            System.out.println(CheckSpring(day,month));

   }

     public static String CheckSpring(int day,int month){
```

```
            if ((month == 3 && day >= 20) || (month == 4) || (month == 5) || (month == 6 &&
day <= 20)) {
        return "Spring Season";
      }
      return "Not a spring season";

    }
}
```

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

```
import java.util.Scanner;

public class EmployeeBonus {

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

            System.out.println(SumOfN(num));

   }

    public static int SumOfN(int n){

            return n*(n+1)/2;


    }
}
```

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)

```
import java.util.Scanner;

public class EmployeeBonus {

   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                  int num1=input.nextInt(),num2=input.nextInt(),num3=input.nextInt();

                  int[] result= SmallLarge(num1,num2,num3);
            System.out.printf("The smallest value is %d\n",result[0]);
            System.out.printf("The smallest value is %d",result[1]);
   }

         public static int[] SmallLarge(int num1,int num2,int num3){


                  int smallest=Math.min(num1,Math.min(num2,num3));
                  int largest=Math.max(num1,Math.max(num2,num3));

                  return new int[]{smallest,largest};



         }
}
```

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)

      import java.util.Scanner;

```
public class EmployeeBonus {

   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                  int num1=input.nextInt(),num2=input.nextInt();

                  int[] result= SmallLarge(num1,num2);
            System.out.printf("The Quotient is %d\n",result[0]);
            System.out.printf("The remainder is %d",result[1]);
   }

         public static int[] SmallLarge(int num1,int num2){


                  int quotient=num1/num2;
                  int remainder=num1%num2;

                  return new int[]{quotient,remainder};



         }
}
```

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)

```
import java.util.Scanner;

public class EmployeeBonus {

   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                  int num1=input.nextInt(),num2=input.nextInt();

                  int[] result= SmallLarge(num1,num2);
            System.out.printf("The Quotient is %d\n",result[0]);
            System.out.printf("The remainder is %d",result[1]);
   }

         public static int[] SmallLarge(int num1,int num2){


                  int quotient=num1/num2;
                  int remainder=num1%num2;

                  return new int[]{quotient,remainder};




         }
}
```

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

public double calculateWindChill(double temperature, double windSpeed)

```
import java.util.Scanner;

public class EmployeeBonus {

   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
                  int num1=input.nextInt(),num2=input.nextInt();

                  System.out.println(WindChill(num1,num2));

   }

         public static double WindChill(double temp,double speed){

                  double windchill= 35.74+(0.6215*temp)+ (0.4275*temp-35.75)*
Math.pow(speed,0.16);



                  return windchill;


         }
}
```

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)

```
import java.util.Scanner;

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

        System.out.print("Enter an angle in degrees: ");
        double angle = input.nextDouble();

        double[] trigValues = calculateTrigonometricFunctions(angle);

        System.out.println("Sine: " + trigValues[0]);
        System.out.println("Cosine: " + trigValues[1]);
        System.out.println("Tangent: " + trigValues[2]);

        input.close();
    }

    public static double[] calculateTrigonometricFunctions(double angle) {
        double radians = Math.toRadians(angle);
        double sine = Math.sin(radians);
        double cosine = Math.cos(radians);
        double tangent = Math.tan(radians);
        return new double[]{sine, cosine, tangent};
    }
}
```