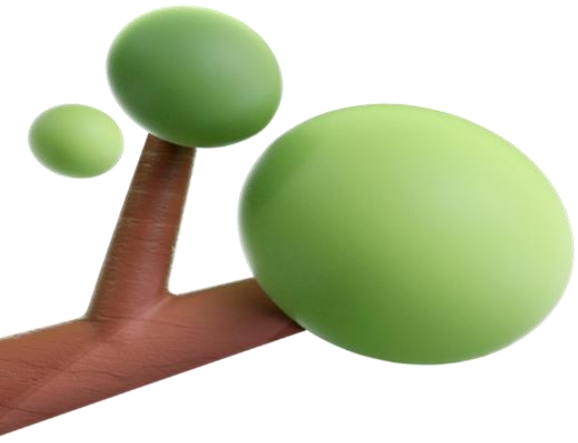


WEEK 3 ASSIGNMENT

STEP PROGRAM

CONTROL FLOW

SUBMITTED BY:

NAME: E.Harikrishna

REG NO: RA2411026010408

CLASS: AJ1

SOURCE CODE

WEEK 3 QUESTION: 1

Q. Write a LeapYear program that takes a year as input and outputs the Year is a Leap Year or not a Leap Year.

```
import java.util.Scanner;

public class LeapYear{

public static void main(String[]args){

Scanner scanner=new Scanner(System.in);

System.out.println("Enter the year:");

int year=scanner.nextInt();

if (year>=1582){

if(year%4==0 && year%100!=0 || year%400==0){

System.out.println("The Year is a Leapyear");

}

else{

System.out.println("The Year is not a Leapyear");

}


}

}

}
```

OUTPUT:

```
Enter the year:
2005
The Year is not a Leapyear
(base) harikrishna@Harikrishnas-MacBook-Air java %
```

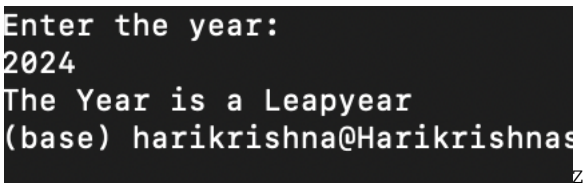
WEEK 3 QUESTION: 2

Q. Rewrite program 1 to determine Leap Year with single if condition using logical and && and or || operators

```
mport java.util.Scanner;

public class Day {
    public static int DayOfWeek(int m, int d, int y) {
        int y0 = y - (14 - m) / 12;
        int x = y0 + y0 / 4 - y0 / 100 + y0 / 400;
        int m0 = m + 12 * ((14 - m) / 12) - 2;
        int d0 = (d + x + 31 * m0 / 12) % 7;
        return d0;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter month (1-12): ");
```

```
        int month = scanner.nextInt();
        System.out.print("Enter day (1-31): ");
        int day = scanner.nextInt();
        System.out.print("Enter year: ");
        int year = scanner.nextInt();
        System.out.println("Day of the week: " + getDayOfWeek(month, day, year));
        scanner.close();
    }
}
```

OUTPUT:



WEEK 3 QUESTION: 3

Q. Write a program to input marks and 3 subjects physics, chemistry and maths. Compute the percentage and then calculate the grade as per the following guidelines

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

```
public class Grader {

    public static String[] calculateGrade(double average) {
        String grade, remarks;

        if (average >= 80) {
            grade = "A";
            remarks = "Level 4, above agency-normalized standards";
        } else if (average >= 70) {
            grade = "B";
            remarks = "Level 3, at agency-normalized standards";
        } else if (average >= 60) {
            grade = "C";
            remarks = "Level 2, below, but approaching agency-normalized standards";
        } else if (average >= 50) {
            grade = "D";
            remarks = "Level 1, well below agency-normalized standards";
        } else if (average >= 40) {
            grade = "E";
            remarks = "Level 1-, too below agency-normalized standards";
        } else {
            grade = "R";
```

```
        remarks = "Remedial standards";
    }

    return new String[]{grade, remarks};
}

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

    System.out.print("Enter marks for Physics: ");
    double physics = scanner.nextDouble();

    System.out.print("Enter marks for Chemistry: ");
    double chemistry = scanner.nextDouble();

    System.out.print("Enter marks for Maths: ");
    double maths = scanner.nextDouble();

    double average = (physics + chemistry + maths) / 3;
    String[] result = calculateGrade(average);

    System.out.printf("\nAverage Marks: %.2f%%\n", average);
    System.out.println("Grade: " + result[0]);
```

```
        System.out.println("Remarks: " + result[1]);


        scanner.close();
    }
}
```

OUTPUT:

```
Enter marks for Physics: 98
Enter marks for Chemistry: 99
Enter marks for Maths: 100

Average Marks: 99.00%
Grade: A
Remarks: Level 4, above agency-
(base) harikrishna@Harikrishnas
```

WEEK 3 QUESTION: 4

Q. Write a Program to check if the given number is a prime number or not

```
import java.util.Scanner;

public class Prime{
    public static boolean isPrime(int number) {
        if (number <= 1) {
            return false;
        }
        boolean isPrime = true;
```

```
        for (int i = 2; i < number; i++) {
            if (number % i == 0) {
                isPrime = false;
                break;
            }
        }
        return isPrime;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();
        if (isPrime(number)) {
            System.out.println(number + " is a Prime Number");
        } else {
            System.out.println(number + " is not a Prime Number");
        }
        scanner.close();
    }
}
```

OUTPUT:

```
Enter a number: 7
7 is a Prime Number
(base) harikrishna@Hari
```

WEEK 3 QUESTION: 5

Q. Create a program to check if a number is armstrong or not. Use the hints to show the steps clearly in the code

```
i import java.util.Scanner;

public class Armstrong {
   public static boolean isArmstrong(int number) {
      int sum = 0, originalNumber = number;
      while (originalNumber != 0) {
         int digit = originalNumber % 10;
         sum += Math.pow(digit, 3);
         originalNumber /= 10;
      }
      return sum == number;
   }
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int number = scanner.nextInt();
```

```
        if (isArmstrong(number)) {
            System.out.println(number + " is an Armstrong Number");
        } else {
            System.out.println(number + " is not an Armstrong Number");
        }
        scanner.close();
    }
}
```

OUTPUT:

```
Enter a number: 153
153 is an Armstrong Number
(base) harikrishna@Harikrishnas-
```

WEEK 3 QUESTION: 6

Q. Create a program to count the number of digits in an integer.

```
import java.util.Scanner;
public class DigitCount {
    public static int countDigits(int number) {
        int count = 0;
```

```
        if (number == 0) return 1;
        while (number != 0) {
            number /= 10;
            count++;
        }
        return count;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();
        System.out.println("Number of digits: " + countDigits(number));
        scanner.close();
    }
}
```

OUTPUT:

```
Enter a number: 444
Number of digits: 3
(base) harikrishna@Hari
```

WEEK 3 QUESTION: 7

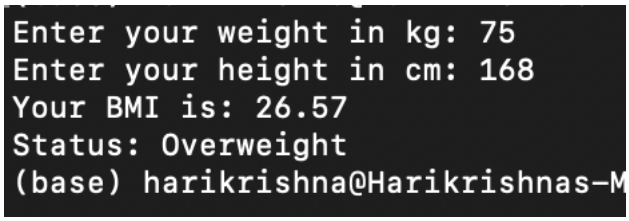
Q. Create a program to find the BMI of a person

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

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

        System.out.print("Enter your weight in kg: ");
        double weight = scanner.nextDouble();

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

        double heightM = heightCm / 100;
        double bmi = weight / (heightM * heightM);

        System.out.printf("Your BMI is: %.2f%n", bmi);

        if (bmi <= 18.4) {
            System.out.println("Status: Underweight");
        } else if (bmi >= 18.5 && bmi <= 24.9) {
            System.out.println("Status: Normal");
        } else if (bmi >= 25.0 && bmi <= 39.9) {
            System.out.println("Status: Overweight");
        } else {
```

```
        System.out.println("Status: Obese");
    }

    scanner.close();
  }
}
```

OUTPUT:



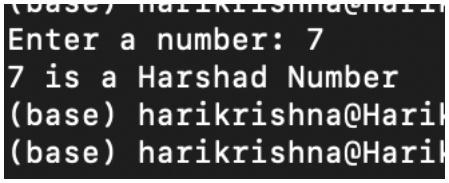
WEEK 3 QUESTION: 8

Q. Create a program to check if a number taken from the user is a Harshad Number.

```
import java.util.Scanner;

public class Checker {

  public static boolean isHarshad(int number) {

    int sum = 0, originalNumber = number;

    while (originalNumber != 0) {
```

```
            sum += originalNumber % 10;
            originalNumber /= 10;
        }
        return number % sum == 0;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();
        if (isHarshad(number)) {
            System.out.println(number + " is a Harshad Number");
        } else {
            System.out.println(number + " is not a Harshad Number");
        }
        scanner.close();
    }
}
```

OUTPUT:



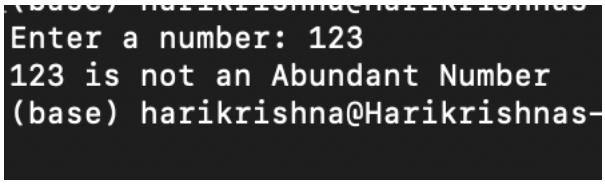
WEEK 3 QUESTION: 9

Q. Create a program to check if a number is an Abundant Number.

```
import java.util.Scanner;


public class Checker1{

   public static boolean isAbundant(int number) {

      int sum = 0;

      for (int i = 1; i < number; i++) {

         if (number % i == 0) {

            sum += i;

         }

      }

      return sum > number;

   }
```

```
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();
        if (isAbundant(number)) {
            System.out.println(number + " is an Abundant Number");
        } else {
            System.out.println(number + " is not an Abundant Number");
        }
        scanner.close();
    }
}
```

OUTPUT:



WEEK 3 QUESTION: 10

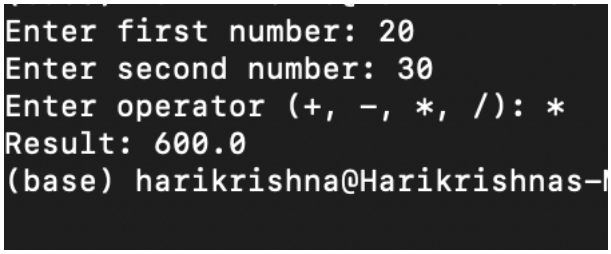
Q. Write a program to create a calculator using switch...case.

```
import java.util.Scanner;

public class SimpleCalculator {

   public static void main(String[] args) {

      Scanner scanner = new Scanner(System.in);

      System.out.print("Enter first number: ");

      double first = scanner.nextDouble();

      System.out.print("Enter second number: ");

      double second = scanner.nextDouble();

      System.out.print("Enter operator (+, -, *, /): ");

      String op = scanner.next();

      double result;

      switch (op) {

         case "+":

            result = first + second;

            System.out.println("Result: " + result);
```

```
            break;
        case "-":
            result = first - second;
            System.out.println("Result: " + result);
            break;
        case "*":
            result = first * second;
            System.out.println("Result: " + result);
            break;
        case "/":
            if (second != 0) {
                result = first / second;
                System.out.println("Result: " + result);
            } else {
                System.out.println("Error: Division by zero is not allowed.");
            }
            break;
```

```
            default:
                System.out.println("Invalid Operator");
        }
        scanner.close();
    }
}
```

OUTPUT:



WEEK 3 QUESTION: 11

Q. Write a program DayOfWeek that takes a date as input and prints the day of the week that the date falls on. Your program should take three command-line arguments: m (month), d (day), and y (year). For m use 1 for January, 2 for February, and so forth. For output print 0 for Sunday, 1 for Monday, 2 for Tuesday, and so forth. Use the following formulas, for the Gregorian calendar (where / denotes integer division):.

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

```
public class Day {
    public static int DayOfWeek(int m, int d, int y) {
        int y0 = y - (14 - m) / 12;
        int x = y0 + y0 / 4 - y0 / 100 + y0 / 400;
        int m0 = m + 12 * ((14 - m) / 12) - 2;
        int d0 = (d + x + 31 * m0 / 12) % 7;
        return d0;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter month (1-12): ");
        int month = scanner.nextInt();
        System.out.print("Enter day (1-31): ");
        int day = scanner.nextInt();
        System.out.print("Enter year: ");
        int year = scanner.nextInt();
        System.out.println("Day of the week: " + DayOfWeek(month,
day, year));
```

```
        scanner.close();
    }
}
```

OUTPUT: