

// Java Control Flow Level 3 Programs

// Q1. Leap Year

import java.util.\*;

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

        Scanner input = new Scanner(System.in);

        System.out.println("Enter a year: ");
        int year = input.nextInt();

        if (year%4 == 0){
            System.out.println("Leap Year");
        } else {
            System.out.println("Not Leap Year");
        }
    }
}
```

// Q2. Leap Year with && Operator

import java.util.\*;

```
class LeapYear2{
    public static void main(String[] args){

        Scanner input = new Scanner(System.in);

        System.out.println("Enter a year: ");
        int year = input.nextInt();

        if (year%4 == 0 && year / 4 !=0){
            System.out.println("Leap Year");
        } else {
            System.out.println("Not Leap Year");
        }
    }
}
```

// Q3. Grade Calculator

import java.util.\*;

```
class GradeCalculator{
```

```

public static void main(String[] args){

    Scanner input = new Scanner(System.in);

    System.out.println("Enter Physics Marks: ");
    double phy = input.nextDouble();

    System.out.println("Enter Chemistry Marks: ");
    double chem = input.nextDouble();

    System.out.println("Enter Maths Marks: ");
    double math = input.nextDouble();

    double average = (phy+chem+math)/3;

    if (average >= 80){
        System.out.println("Average Marks: "+average+"\nGrade: A");
    }
    else if (average >= 70){
        System.out.println("Average Marks: "+average+"\nGrade: B");
    }
    else if (average >= 60){
        System.out.println("Average Marks: "+average+"\nGrade: C");
    }
    else if (average >= 50){
        System.out.println("Average Marks: "+average+"\nGrade: D");
    }
    else if (average >= 40){
        System.out.println("Average Marks: "+average+"\nGrade: E");
    }
    else {
        System.out.println("Average Marks: "+average+"\nGrade: R");
    }
}
}

```

// Q4. Prime Number Checker

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

```

class PrimeNumberChecker {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a number: ");
    }
}

```

```

int number = input.nextInt();

if (number <= 1) {
    System.out.println(number + " is not a prime number.");
} else {
    boolean isPrime = true;
    for (int i = 2; i <= Math.sqrt(number); i++) {
        if (number % i == 0) {
            isPrime = false;
            break;
        }
    }
    if (isPrime) {
        System.out.println(number + " is a prime number.");
    } else {
        System.out.println(number + " is not a prime number.");
    }
}
input.close();
}
}

```

// Q5. Armstrong Number Checker  
import java.util.Scanner;

```

class ArmstrongNumberChecker {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = input.nextInt();

        int originalNumber = number, sum = 0;

        while (number != 0) {
            int digit = number % 10;
            sum += Math.pow(digit, 3);
            number /= 10;
        }

        if (sum == originalNumber) {
            System.out.println(originalNumber + " is an Armstrong number.");
        } else {
            System.out.println(originalNumber + " is not an Armstrong number.");
        }
    }
}

```

```
        input.close();
    }
}
```

// Q6. Digit Counter

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

```
class DigitCounter {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = input.nextInt();

        int count = 0;
        while (number != 0) {
            number /= 10;
            count++;
        }

        System.out.println("Number of digits: " + count);
        input.close();
    }
}
```

// Q7. BMI Calculator

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

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

        System.out.print("Enter weight in kg: ");
        double weight = input.nextDouble();
        System.out.print("Enter height in cm: ");
        double height = input.nextDouble() / 100; // Convert cm to m

        double bmi = weight / (height * height);
        System.out.printf("Your BMI is: %.2f\n", bmi);

        if (bmi < 18.5) {
            System.out.println("Underweight");
        } else if (bmi < 24.9) {
            System.out.println("Normal weight");
        } else if (bmi < 29.9) {
```

```

        System.out.println("Overweight");
    } else {
        System.out.println("Obese");
    }

    input.close();
}
}

```

// Q8. Harshad Number Checker

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

```

class HarshadNumberChecker {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = input.nextInt();

        int originalNumber = number, sum = 0;

        while (number != 0) {
            sum += number % 10;
            number /= 10;
        }

        if (originalNumber % sum == 0) {
            System.out.println(originalNumber + " is a Harshad Number.");
        } else {
            System.out.println(originalNumber + " is not a Harshad Number.");
        }

        input.close();
    }
}

```

// Q9. Abundant Number Checker

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

```

class AbundantNumberChecker {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = input.nextInt();
    }
}

```

```

int sum = 0;
for (int i = 1; i < number; i++) {
    if (number % i == 0) {
        sum += i;
    }
}

if (sum > number) {
    System.out.println(number + " is an Abundant Number.");
} else {
    System.out.println(number + " is not an Abundant Number.");
}

input.close();
}
}

```

// Q10. Simple Calculator  
import java.util.Scanner;

```

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

        System.out.print("Enter first number: ");
        double first = input.nextDouble();
        System.out.print("Enter second number: ");
        double second = input.nextDouble();
        System.out.print("Enter operator (+, -, *, /): ");
        String op = input.next();

        switch (op) {
            case "+":
                System.out.println("Result: " + (first + second));
                break;
            case "-":
                System.out.println("Result: " + (first - second));
                break;
            case "*":
                System.out.println("Result: " + (first * second));
                break;
            case "/":
                if (second != 0) {
                    System.out.println("Result: " + (first / second));
                }
            }
    }
}

```

```

        } else {
            System.out.println("Cannot divide by zero.");
        }
        break;
    default:
        System.out.println("Invalid operator.");
    }

    input.close();
}
}

```

// Q11. Day of the Week Calculator

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

```

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

        System.out.print("Enter month (1-12): ");
        int m = input.nextInt();
        System.out.print("Enter day (1-31): ");
        int d = input.nextInt();
        System.out.print("Enter year: ");
        int y = input.nextInt();

        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;

        System.out.println("Day of the week: " + d0); // 0 = Sunday, 1 = Monday, ...

        input.close();
    }
}

```