Basic Questions:

1.Check if a number is even or odd

- Write a Java program that takes an integer input and prints whether it is even or odd using an if-else statement.

```java
import java.util.Scanner;
class EvenOdd {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int num = sc.nextInt();
        System.out.println(num % 2 == 0 ? "Even" : "Odd");
    }
}
```

Example Output:

Input: 7

Odd

2.Find the largest of three numbers

- Write a Java program that takes three numbers as input and prints the largest one using if-else.

```java
import java.util.Scanner;
class LargestNumber {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt(), b = sc.nextInt(), c = sc.nextInt();
        if (a >= b && a >= c)
            System.out.println(a);
        else if (b >= c)
            System.out.println(b);
        else
            System.out.println(c);
    }
}
```

Example Output:

Input: 10 20 15

20

3.Grade Calculator

- Given a student's marks (out of 100), print their grade based on the following criteria:

  - 90-100 → A

  - 80-89 → B

  - 70-79 → C

  - 60-69 → D

  - Below 60 → F

```java
import java.util.Scanner;
class GradeCalculator {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int marks = sc.nextInt();
        if (marks >= 90)
            System.out.println("A");
        else if (marks >= 80)
            System.out.println("B");
        else if (marks >= 70)
            System.out.println("C");
        else if (marks >= 60)
            System.out.println("D");
        else
            System.out.println("F");
    }
}
```

Example Output:

1) Input: 85

   B

2) Input: 55

   F

4.Leap Year Checker

- Write a program that takes a year as input and determines whether it is a leap year or not using if-else conditions.

- A year is a leap year if:

  - It is divisible by 400 OR

  - It is divisible by 4 but NOT divisible by 100.

```java
import java.util.Scanner;
class LeapYear {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int year = sc.nextInt();
        if (year % 400 == 0 || (year % 4 == 0 && year % 100 != 0))
            System.out.println("Leap Year");
        else
            System.out.println("Not a Leap Year");
    }
}
```

Example Output:

Input: 2024

Leap Year

Input: 1900

Not a Leap Year

5. Number of Days in a Month (Switch Case)

- Write a program that takes the month number (1-12) as input and prints the number of days in that month using a switch case.

- Consider leap year conditions for February.

```java
import java.util.Scanner;
class DaysInMonth {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int month = sc.nextInt(), year = sc.nextInt();
        switch (month) {
            case 1, 3, 5, 7, 8, 10, 12 -> System.out.println(31);
            case 4, 6, 9, 11 -> System.out.println(30);
            case 2 -> System.out.println((year % 400 == 0 || (year % 4 == 0 && year % 100 != 0)) ? 29 : 28);
            default -> System.out.println("Invalid Month");
        }
    }
}
```

Example Output:

Enter month number (1-12): 2

Enter year: 2024

Number of days: 29

Enter month number (1-12): 4

Enter year: 2023

Number of days: 30

Loop-Based Questions:

6.Sum of first N natural numbers

- Write a Java program that takes an integer N as input and calculates the sum of first N natural numbers using a for loop.

```java
import java.util.*;

public class SumNaturalNumbers {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter N: ");
        int n = sc.nextInt();

        int sum = 0;
        for (int i = 1; i <= n; i++)
            sum += i;

        System.out.println("Sum: " + sum);
        sc.close();
    }
}
```

7.Reverse a number

- Write a Java program that takes a number as input and prints its reverse using a while loop.

- Example: Input = 1234, Output = 4321

```java
import java.util.*;

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

        int rev = 0;
        while (num > 0) {
            rev = rev * 10 + num % 10;
            num /= 10;
        }

        System.out.println("Reversed Number: " + rev);
        sc.close();
    }
}
```

8.Check if a number is prime

- Write a Java program that checks whether a number N is prime or not using a for loop.

```java
import java.util.*;

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

        boolean isPrime = num > 1;
        for (int i = 2; i * i <= num; i++) {
            if (num % i == 0) {
                isPrime = false;
                break;
            }
        }

        System.out.println(num + " is " + (isPrime ? "Prime" : "Not Prime"));
        sc.close();
    }
}
```

9.Print Fibonacci series up to N terms

- Write a Java program that prints the first N Fibonacci numbers using a for loop.

- Example: Input = 5, Output = 0 1 1 2 3

```java
import java.util.*;

public class FibonacciSeries {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter N: ");
        int n = sc.nextInt();

        int a = 0, b = 1;
        System.out.print("Fibonacci Series: " + a);
        if (n > 1) System.out.print(" " + b);

        for (int i = 2; i < n; i++) {
            int next = a + b;
            System.out.print(" " + next);
            a = b;
            b = next;
        }

        sc.close();
    }
}
```

10.Print pattern using nested loops

- Write a Java program to print the following pattern using nested for loops:

```
*

* *

* * *

* * * *

* * * * *
```

```java
import java.util.*;

public class StarPattern {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter number of rows: ");
        int rows = sc.nextInt();

        for (int i = 1; i <= rows; i++) {
            for (int j = 1; j <= i; j++)
                System.out.print("* ");
            System.out.println();
        }

        sc.close();
    }
}
```