```
//1
import java.util.Scanner;

public class PrimeNumberChecker {

    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();
    }

    public static boolean isPrime(int num) {

        if (num <= 1) {
            return false;
        }


        for (int i = 2; i <= Math.sqrt(num); i++) {
            if (num % i == 0) {
                return false;
            }
        }

        return true;
    }
}


//2
import java.util.Scanner;

public class PalindromeChecker {

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

```
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

        if (isPalindrome(number)) {
            System.out.println(number + " is a palindrome.");
        } else {
            System.out.println(number + " is not a palindrome.");
        }

        scanner.close();
    }

    public static boolean isPalindrome(int num) {
        int originalNum = num;
        int reversedNum = 0;

        while (num != 0) {
            int digit = num % 10;
            reversedNum = reversedNum * 10 + digit;
            num /= 10;
        }

        return originalNum == reversedNum;
    }
}


//3
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 num1 = scanner.nextDouble();

        System.out.print("Enter second number: ");
        double num2 = scanner.nextDouble();

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

```
        char operator = scanner.next().charAt(0);

        double result;

        switch (operator) {
            case '+':
                result = num1 + num2;
                System.out.println("The result is: " + result);
                break;
            case '-':
                result = num1 - num2;
                System.out.println("The result is: " + result);
                break;
            case '*':
                result = num1 * num2;
                System.out.println("The result is: " + result);
                break;
            case '/':
                if (num2 != 0) {
                    result = num1 / num2;
                    System.out.println("The result is: " + result);
                } else {
                    System.out.println("Error! Division by zero.");
                }
                break;
            default:
                System.out.println("Invalid operator!");
                break;
        }

        scanner.close();
    }
}



//4
import java.util.Scanner;

public class PrintTriangle {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the height of the triangle: ");
        int height = scanner.nextInt();
```

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



//5


import java.util.Scanner;

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

        int n = rows / 2 + 1;


        for (int i = 1; i <= n; i++) {
            for (int j = i; j < n; j++) {
                System.out.print(" ");
            }
            for (int j = 1; j <= (2 * i - 1); j++) {
                System.out.print("*");
            }
            System.out.println();
        }


        for (int i = n-1; i >= 1; i--) {
            for (int j = n; j > i; j--) {
                System.out.print(" ");
            }
            for (int j = 1; j <= (2 * i - 1); j++) {
                System.out.print("*");
            }
```

```
            System.out.println();
        }

        scanner.close();
    }
}
```