1)a)import java.util.Scanner;

public class IntegerInputOutput {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter an integer: ");

int enteredInteger = scanner.nextInt();

System.out.println("The entered integer is: " + enteredInteger);

scanner.close(); // Good practice to close resources when done

}

}

b)import java.util.Scanner;

public class AverageCalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the first floating-point number: ");

double num1 = scanner.nextDouble();

System.out.print("Enter the second floating-point number: ");

double num2 = scanner.nextDouble();

double average = (num1 + num2) / 2;

// Format the average to two decimal places

System.out.printf("The average of %.2f and %.2f is: %.2f%n", num1, num2, average);

scanner.close();

}

}

2)import java.util.Scanner;

public class SimpleCalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

double num1 = scanner.nextDouble();

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

double num2 = scanner.nextDouble();

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

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

double result = 0;

switch (operator) {

case '+':

result = num1 + num2;

break;

case '-':

result = num1 - num2;

break;

case '\*':

result = num1 \* num2;

break;

case '/':

if (num2 == 0) {

System.out.println("Error: Division by zero is not allowed.");

} else {

result = num1 / num2;

}

break;

default:

System.out.println("Invalid operator. Please enter +, -, \*, or /.");

}

if (result != 0) {

System.out.printf("%.2f %c %.2f = %.2f%n", num1, operator, num2, result);

}

scanner.close();

}

}

3)import java.util.HashSet;

public class HappyNumber {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

int n = scanner.nextInt();

boolean isHappy = isHappyNumber(n);

System.out.println(isHappy);

scanner.close();

}

public static boolean isHappyNumber(int n) {

HashSet<Integer> seen = new HashSet<>();

while (n != 1 && !seen.contains(n)) {

seen.add(n);

n = numSquareSum(n);

}

return n == 1;

}

public static int numSquareSum(int n) {

int sum = 0;

int digit;

while (n > 0) {

digit = n % 10;

sum += digit \* digit;

n /= 10;

}

return sum;

}

}