1. **a) Write a Java program that prompts the user to enter an integer, reads the input, and displays the entered integer on the console.**

**CODE :**

import java.util.Scanner;

public class ReadInteger {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

int userInput = scanner.nextInt();

System.out.println("You entered: " + userInput);

scanner.close();

}

}

**b) Develop a Java program that reads two floating-point numbers from the user, calculates their average, and displays the result on the console with two decimal places.**

**CODE :**

import java.util.Scanner;

public class CalculateAverage {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

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

double num1 = scanner.nextDouble();

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

double num2 = scanner.nextDouble();

double average = (num1 + num2) / 2;

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

scanner.close();

}

}

1. **Implement a Java program that simulates a basic calculator with functionalities to perform addition, subtraction, multiplication, and division.**

**CODE :**

import java.util.Scanner;

public class BasicCalculator {

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 the operator (+, -, \*, /): ");

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

double result;

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.");

return;

}

result = num1 / num2;

break;

default:

System.out.println("Error: Invalid operator entered.");

return;

}

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

scanner.close();

}

}

**3.   Write an Java program to determine if a number n is happy.**

**CODE :**

import java.util.HashSet;

public class HappyNumber {

public static boolean isHappy(int n) {

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

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

seen.add(n);

n = getSumOfSquaredDigits(n);

return n == 1;

}

public static int getSumOfSquaredDigits(int n) {

int sum = 0;

while (n > 0) {

int digit = n % 10;

sum += digit \* digit;

n /= 10;

}

return sum;

}

public static void main(String[] args) {

int numberToCheck = 19;

boolean isHappyNumber = isHappy(numberToCheck);

System.out.println("Is " + numberToCheck + " a happy number? " + isHappyNumber);

}

}