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SCT221-0807/2022

1. Question One: Sum of Even Fibonacci Numbers

public class FibonacciEvenSum {

public static void main(String[] args) {

System.out.println("Sum of even Fibonacci numbers not exceeding 4 million: " + sumEvenFibonacci(4000000));

}

public static int sumEvenFibonacci(int limit) {

int a = 1, b = 2;

int sum = 0;

while (a <= limit) {

if (a % 2 == 0) {

sum += a;

}

int next = a + b;

a = b;

b = next;

}

return sum;

}

}

1. Palindrome Checker with GUI

import javax.swing.\*;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

public class PalindromeCheckerGUI {

public static void main(String[] args) {

JFrame frame = new JFrame("Palindrome Checker");

JPanel panel = new JPanel();

JLabel label = new JLabel("Enter a number:");

JTextField textField = new JTextField(15);

JButton checkButton = new JButton("Check");

JLabel resultLabel = new JLabel("");

panel.add(label);

panel.add(textField);

panel.add(checkButton);

panel.add(resultLabel);

checkButton.addActionListener(new ActionListener() {

@Override

public void actionPerformed(ActionEvent e) {

String input = textField.getText();

if (isPalindrome(input)) {

resultLabel.setText("Palindrome");

} else {

resultLabel.setText("Not palindrome");

}

}

});

frame.add(panel);

frame.setSize(300, 120);

frame.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

frame.setVisible(true);

}

public static boolean isPalindrome(String str) {

String reversed = new StringBuilder(str).reverse().toString();

return str.equals(reversed);

}

}

1. Array Operations

import java.util.Arrays;

import java.util.Scanner;

public class ArrayOperations {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

int[] numbers = new int[15];

// a) Input 15 values into the array

System.out.println("Enter 15 integer values:");

for (int i = 0; i < 15; i++) {

numbers[i] = scanner.nextInt();

}

// a) Print values in the array

System.out.println("Values in the array:");

for (int num : numbers) {

System.out.print(num + " ");

}

System.out.println();

// b) Check if a number is in the array

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

int searchNumber = scanner.nextInt();

boolean found = false;

for (int i = 0; i < numbers.length; i++) {

if (numbers[i] == searchNumber) {

System.out.println("The number found at index " + i);

found = true;

break;

}

}

if (!found) {

System.out.println("Number not found in this array");

}

// c) Sort the array in ascending order

Arrays.sort(numbers);

System.out.println("Sorted array:");

for (int num : numbers) {

System.out.print(num + " ");

}

System.out.println();

// d) Reverse the array and print

int[] reversedArray = new int[numbers.length];

for (int i = 0; i < numbers.length; i++) {

reversedArray[i] = numbers[numbers.length - 1 - i];

}

System.out.println("Reversed array:");

for (int num : reversedArray) {

System.out.print(num + " ");

}

System.out.println();

// e) Calculate sum and product of all elements

int sum = 0;

int product = 1;

for (int num : numbers) {

sum += num;

product \*= num;

}

System.out.println("Sum: " + sum);

System.out.println("Product: " + product);

scanner.close();

}

}