***JAVA ASSIGNMENT***

1. ***A prime number is a number that is evenly divisible only by itself and 1. For example, the number 5 is prime because it can be evenly divided only by 1 and 5. The number 6, however, is not prime because it can be divided evenly by 1, 2, 4, and 6. Write a method named isPrime, which takes an integer as an argument and returns true if the argument is a prime number, or false otherwise. Also write main method that displays prime numbers between 1 to 500.***

**public class PrimeNumbers {**

**public static boolean isPrime(int number) {**

**if (number <= 1) {**

**return false;**

**}**

**for (int i = 2; i <= Math.sqrt(number); i++) {**

**if (number % i == 0) {**

**return false;**

**}**

**}**

**return true;**

**}**

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

**for (int i = 1; i <= 500; i++) {**

**if (isPrime(i)) {**

**System.out.println(i);**

**}**

**}**

**}**

**}**

1. ***Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...***

***public class FibonacciSequence {***

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

***int limit = 100;***

***int previous = 1;***

***int current = 2;***

***int next = previous + current;***

***System.out.print(previous + ", " + current);***

***while (next <= limit) {***

***System.out.print(", " + next);***

***previous = current;***

***current = next;***

***next = previous + current;***

***}***

***}***

***}***

1. ***By considering the terms in the Fibonacci sequence whose values do not exceed four million, write a Java method to find the sum of all the even- valued terms.***

***public static int sumEvenFibonacciTerms() {***

***int sum = 0;***

***int a = 1;***

***int b = 2;***

***while (b <= 4000000) {***

***if (b % 2 == 0) {***

***sum += b;***

***}***

***int c = a + b;***

***a = b;***

***b = c;***

***}***

***return sum;***

***}***

**Question two: [15 marks]**

***A palindrome number is a number that remain the same when read from behind or front ( a number that is equal to reverse of number) for example, 353 is palindrome because reverse of 353 is 353 (you see the number remains the same). But a number like 591 is not palindrome because reverse of 591 is 195 which is not equal to 591. Write Java program to check if a number entered by the user is palindrome or not. You should provide the user with a GUI interface to enter the number and display the results on the same interface.***

***import javax.swing.\*;***

***public class PalindromeChecker {***

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

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

***// create label and text field***

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

***JTextField textField = new JTextField(10);***

***// create button and action listener***

***JButton button = new JButton("Check");***

***button.addActionListener(e -> {***

***String input = textField.getText();***

***if (isPalindrome(input)) {***

***JOptionPane.showMessageDialog(frame, input + " is a palindrome.");***

***} else {***

***JOptionPane.showMessageDialog(frame, input + " is not a palindrome.");***

***}***

***});***

***// add components to panel***

***JPanel panel = new JPanel();***

***panel.add(label);***

***panel.add(textField);***

***panel.add(button);***

***// add panel to frame and show it***

***frame.add(panel);***

***frame.pack();***

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

***frame.setVisible(true);***

***}***

***public static boolean isPalindrome(String input) {***

***String reverse = new StringBuilder(input).reverse().toString();***

***return input.equals(reverse);***

***}***

***}***

**Question three: [15 marks]**

***Write a Java program that takes 15 values of type integer as inputs from user, store the values in an array.***

1. ***Print the values stored in the array on screen.***

***import java.util.Scanner;***

***public class ArrayExample {***

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

***Scanner input = new Scanner(System.in);***

***int[] numbers = new int[15];***

***System.out.println("Please enter 15 integer values:");***

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

***System.out.print("Value " + (i + 1) + ": ");***

***numbers[i] = input.nextInt();***

***}***

***System.out.println("The values stored in the array are:");***

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

***System.out.print(numbers[i] + " ");***

***}***

***}***

***}  
b) Ask user to enter a number, check if that number (entered by user) is present in array***

***or not. If it is present print, “the number found at index (index of the number) ” and the text “number not found in this array”***

***import java.util.Scanner;***

***public class ArrayExample {***

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

***Scanner input = new Scanner(System.in)***

***int[] numbers = new int[15]***

***System.out.println("Please enter 15 integer values:");***

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

***System.out.print("Value " + (i + 1) + ": ");***

***numbers[i] = input.nextInt();***

***}***

***System.out.print("Please enter a number to search for: ");***

***int searchNumber = input.nextInt();***

***boolean found = false;***

***int index = -1;***

***for (int i = 0***

1. ***Create another array, copy all the elements from the existing array to the new array but in reverse order. Now print the elements of the new array on the screen***

***# Define the existing array***

***arr = [1, 2, 3, 4, 5]***

***# Create a new array and copy the elements in reverse order***

***new\_arr = arr[::-1]***

***# Print the elements of the new array on the screen***

***for elem in new\_arr:***

***print(elem)***

***d) Get the sum and product of all elements of your array. Print product and the sum each on its own line. # Define the array***

***arr = [1, 2, 3, 4, 5]***

***# Calculate the sum of all elements***

***arr\_sum = sum(arr)***

***# Calculate the product of all elements***

***arr\_product = 1***

***for elem in arr:***

***arr\_product \*= elem***

***# Print the sum and product on separate lines***

***print("Sum of elements:", arr\_sum)***

***print("Product of elements:", arr\_product)***