2b.Write a menu driven Java program which will read a number and should implement the following methods 1. factorial() 2. testArmstrong() 3. testPalindrome() 4. testPrime() 5. fibonacciSeries()

**Code:-**

**import java.util.Scanner;**

**public class NumberOperations {**

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

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

**int choice;**

**do {**

**System.out.println("\nMenu:");**

**System.out.println("1. Factorial");**

**System.out.println("2. Test Armstrong Number");**

**System.out.println("3. Test Palindrome");**

**System.out.println("4. Test Prime Number");**

**System.out.println("5. Fibonacci Series");**

**System.out.println("6. Exit");**

**System.out.print("Enter your choice: ");**

**choice = scanner.nextInt();**

**switch (choice) {**

**case 1:**

**factorial();**

**break;**

**case 2:**

**testArmstrong();**

**break;**

**case 3:**

**testPalindrome();**

**break;**

**case 4:**

**testPrime();**

**break;**

**case 5:**

**fibonacciSeries();**

**break;**

**case 6:**

**System.out.println("Exiting the program. Thank you!");**

**break;**

**default:**

**System.out.println("Invalid choice. Please try again.");**

**}**

**} while (choice != 6);**

**scanner.close();**

**}**

**public static void factorial() {**

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

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

**int n = scanner.nextInt();**

**int factorial = 1;**

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

**factorial \*= i;**

**}**

**System.out.println("Factorial of " + n + ": " + factorial);**

**}**

**public static void testArmstrong() {**

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

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

**int num = scanner.nextInt();**

**int originalNum = num;**

**int sum = 0;**

**while (num > 0) {**

**int digit = num % 10;**

**sum += Math.pow(digit, 3);**

**num /= 10;**

**}**

**if (sum == originalNum) {**

**System.out.println(originalNum + " is an Armstrong number.");**

**} else {**

**System.out.println(originalNum + " is not an Armstrong number.");**

**}**

**}**

**public static void testPalindrome() {**

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

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

**int num = scanner.nextInt();**

**int originalNum = num;**

**int reversedNum = 0;**

**while (num != 0) {**

**int digit = num % 10;**

**reversedNum = reversedNum \* 10 + digit;**

**num /= 10;**

**}**

**if (originalNum == reversedNum) {**

**System.out.println(originalNum + " is a palindrome.");**

**} else {**

**System.out.println(originalNum + " is not a palindrome.");**

**}**

**}**

**public static void testPrime() {**

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

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

**int num = scanner.nextInt();**

**boolean isPrime = true;**

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

**isPrime = false;**

**} else {**

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

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

**isPrime = false;**

**break;**

**}**

**}**

**}**

**if (isPrime) {**

**System.out.println(num + " is a prime number.");**

**} else {**

**System.out.println(num + " is not a prime number.");**

**}**

**}**

**public static void fibonacciSeries() {**

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

**System.out.print("Enter the number of terms for Fibonacci series: ");**

**int n = scanner.nextInt();**

**int firstTerm = 0, secondTerm = 1;**

**System.out.println("Fibonacci Series:");**

**for (int i = 0; i < n; i++) {**

**System.out.print(firstTerm + " ");**

**int nextTerm = firstTerm + secondTerm;**

**firstTerm = secondTerm;**

**secondTerm = nextTerm;**

**}**

**}**

**}**