|  |  |
| --- | --- |
| **AP Computer Science** | **TextLab13 Java Assignment** |
| **The "Recursive Methods" program** | **40 through 100 Point Versions** |
| **Assignment Purpose:**  The purpose of this program is to demonstrate knowledge of fundamental recursive concepts by completing a variety of methods with a recursive implementation. | |

For this assignment you will be supplied with a program that includes seven incomplete methods. Each one of the incomplete methods is written as a stub and includes a comment that explains the method purpose. You need to complete the 7 methods using only **recursive** algorithms.

|  |  |
| --- | --- |
| **TextLab13 Student Version** | **Do not copy this file, which is provided.** |
| **// TextLab13st.java**  **// The Recursive Methods Program**  **// This is the student, starting version of the Lab19TEXT05 assignment.**  **// Students need to write the implementations of the**  **// <countUp>, <countDown>, <sum>, <fact>, <pow>, <fibo>, and <gcf> methods.**    **public class TextLab13st**  **{**  **public static void main(String args[])**  **{**  **System.out.println("TextLab13");**  **skip2();**  **System.out.println("Counting from 1 up to 10");**  **Test.countUp(1,10);**  **skip3();**  **System.out.println("Counting from 10 down to 1");**  **Test.countDown(1,10);**  **skip3();**  **System.out.println("The sum of all integers 0 to 100 are " + Test.sum(100));**  **skip2();**  **System.out.println("The factorial of 8 is " + Test.fact(8));**  **skip2();**  **System.out.println("The 10th Fibonacci Number is " + Test.fibo(10));**  **skip2();**  **System.out.println("The GCF of 120 and 108 is " + Test.gcf(120,108));**  **skip2();**  **System.out.println("2 raised to the 8th power is " + Test.pow(2,8));**  **skip2();**  **}**    **public static void skip2()**  **{**  **System.out.println("\n");**  **}**    **public static void skip3()**  **{**  **System.out.println("\n\n");**  **}**  **}**  **class Test**  **{**  **public static void countUp(int k, int n)**  **// displays consecutive integers from k to n**  **{**  **}**    **public static void countDown(int k, int n)**  **// displays consecutive integers backwards from k to n**  **{**  **}**    **public static int sum(int n)**  **// returns the sum of all integers 1 + 2 + .... + n-1 + n**  **{**  **}**    **public static int fact(int n)**  **// returns n factorial**  **{**  **}**    **public static int fibo(int n)**  **// returns the nth Fibonacci number**  **{**  **}**    **public static int gcf(int n1, int n2)**  **// returns the gcf of n1 and n2**  **{**  **}**    **public static int pow(int n1, int n2)**  **// returns n1 raised to the n2 power**  **{**  **}**    **}** | |

**100 Point Version Specifics**

Writing all 7 methods **recursively** will earn a grade of **100**.

Any method not written, or written **iteratively** will earn **10 point deduction**.

**100 Point Version Output**

