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| **AP® Computer Science (A)** | **Minor Lab17a** |
| **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.

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| **Lab17avst.java Provided Starting File** |
| // Lab17avst.java  // The Recursive Methods Program  // This is the student, starting version of the Lab17a assignment.  // Students need to write the implementations of the  // <countUp>, <countDown>, <sum>, <fact>, <pow>, <fibo> and <gcf> methods.    public class Lab17avst  {  public static void main(String[] args)  {  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 " + 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  {  // displays consecutive integers from k to n  public static void countUp(int k, int n)  {  }    // displays consecutive integers backwards from k to n  public static void countDown(int k, int n)  {  }    // returns the sum of all integers 1 + 2 + .... + n-1 + n  public static int sum(int n)  {  }    // returns n factorial  public static int fact(int n)  {  }    // returns the nth Fibonacci number  public static int fibo(int n)  {  }    // returns the gcf of n1 and n2  public static int gcf(int n1, int n2)  {  }    // returns n1 raised to the n2 power  public static int pow(int n1, int n2)  {  }    } |

**100 Point Version Specifics**

Complete all methods **recursively** will earn a grade of **100**.

Any method not completed, or written **iteratively** will receive a **10 point deduction**.

**100 Point Version Output**

