# CSCE 156 Lab: Recursion

## *Worksheet*

Name_____

1. Activity 1: Modify the Fibonacci code as specified and answer the following questions
   a. When computing `fibonacci(10)`, how many times would `fibonacci(5)` be called?

   b. When computing `fibonacci(20)`, how many times would `fibonacci(10)` be called?

   c. How long does it take for `fibonacci(45)` to execute?


   d. Give an estimate of an asymptotic characterization of the number of times the function is called when `fibonacci(n)` is computed: is it constant, linear, quadratic, cubic, or exponential?


2. Activity 3: Modify the code that renders the Sierpinski Triangle as described in Case Study 3 and answer the following questions.
   a. For a depth of 4 (`recursions = 4`), how many triangles are drawn?


   b. For a depth of 10, how many triangles are drawn?


   c. For a depth of 13, how many triangles are drawn?


   d. (Optional) Without actually running it (the application will most likely crash), can you determine how many triangles are drawn for a depth of 20?


3. Activity 4 & 5: Demonstrate your working program, what are the first 5 and last 5 digits of the 1000-th Pell Number?


Instructor Signature_____