

# CSCE 156 Lab: Recursion

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## 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?