CIS 122

Turtle Assignment

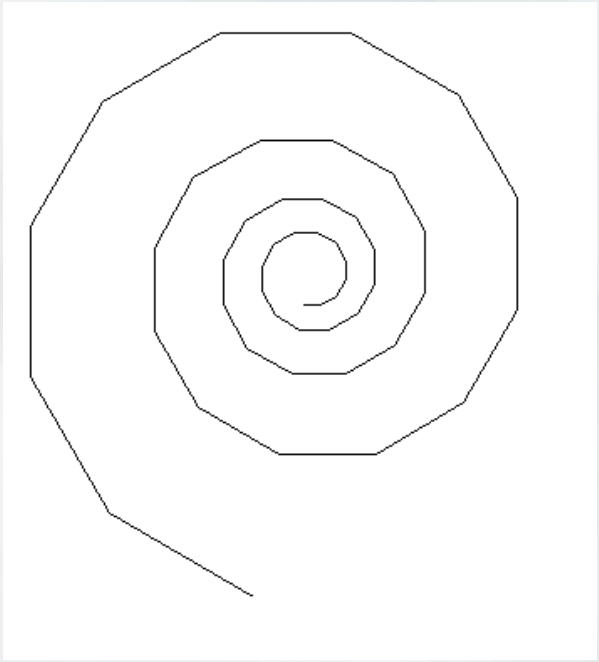
Assignment Breakdown

- Only 3 Parts
  - Part 0 - Getting your turtle up and running
  - Part 1 - Spinning in Circles
  - Part 2 - Fun with Fractals

- You've already done Part 0
  - Get turtle up and running
  - Run sample code
  - Don't need to submit anything

Part 1 - Spinning in Circles

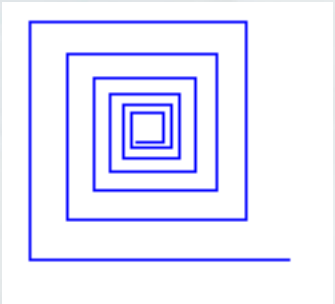
- In this problem, you're going to write a spiral drawing function
- A spiral is a naturally recursive shape
  - The "rest" of a spiral is just another spiral
- How do we draw a spiral?
  - Draw one side
  - Then draw the rest of the spiral



Part 1 - Spinning in Circles

- What defines a spiral?
  - Initial side length
  - Side length modifier
  - Angle

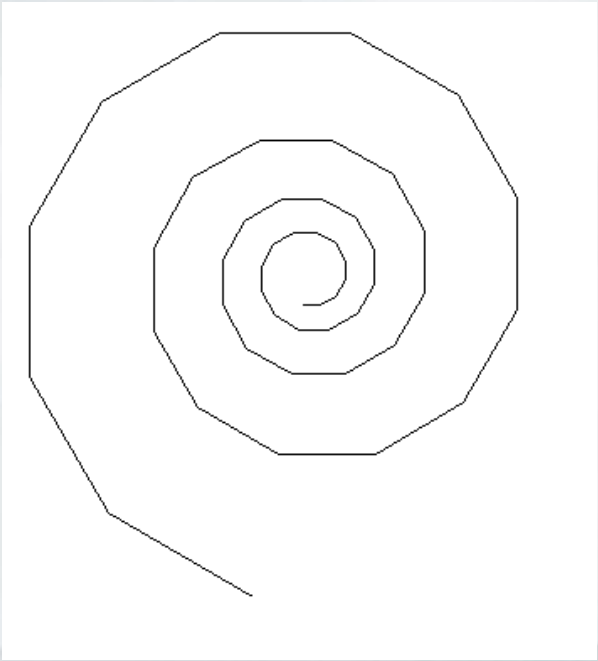
- Our spiral function will take 3 arguments
  - spiral(length, multiplier, angle)
  - First side has given length
  - Each subsequent side grows by multiplier
  - Each subsequent side turns by angle

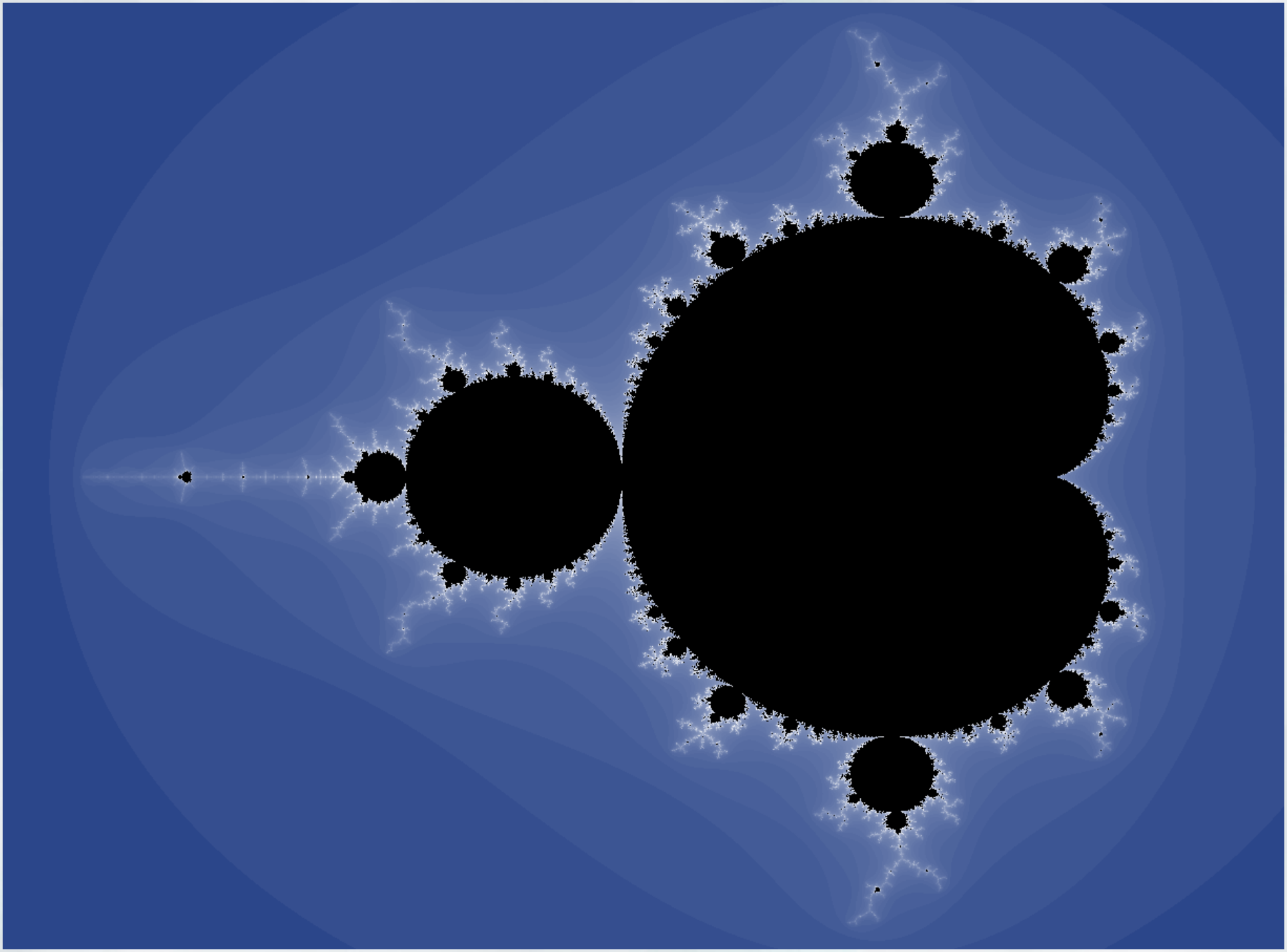


Part 2 - Fun with Fractals

- What is a fractal
  - A self-similar shape
  - Part of the shape looks like the shape as a whole

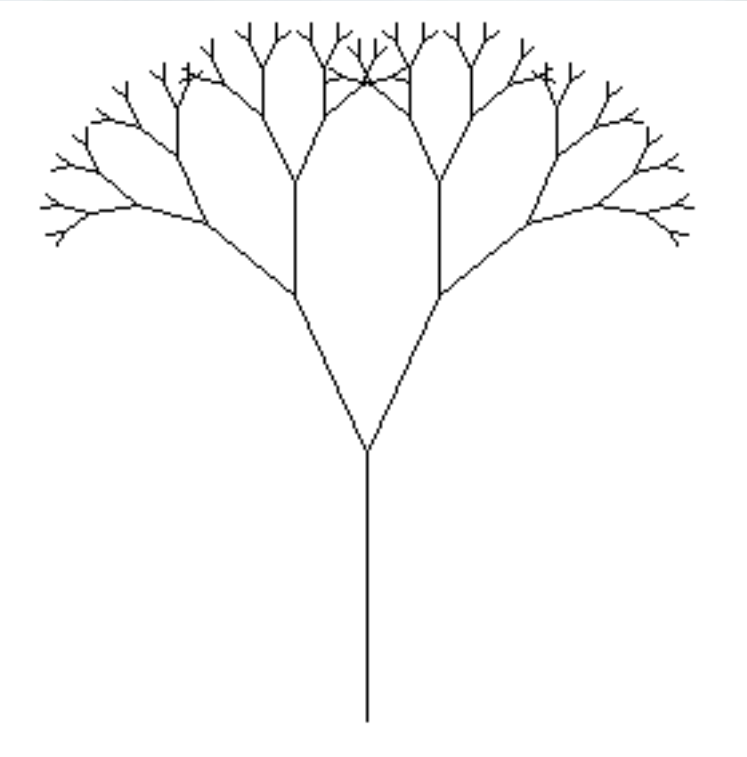
- A spiral is a simple fractal
  - But they can be much more complicated





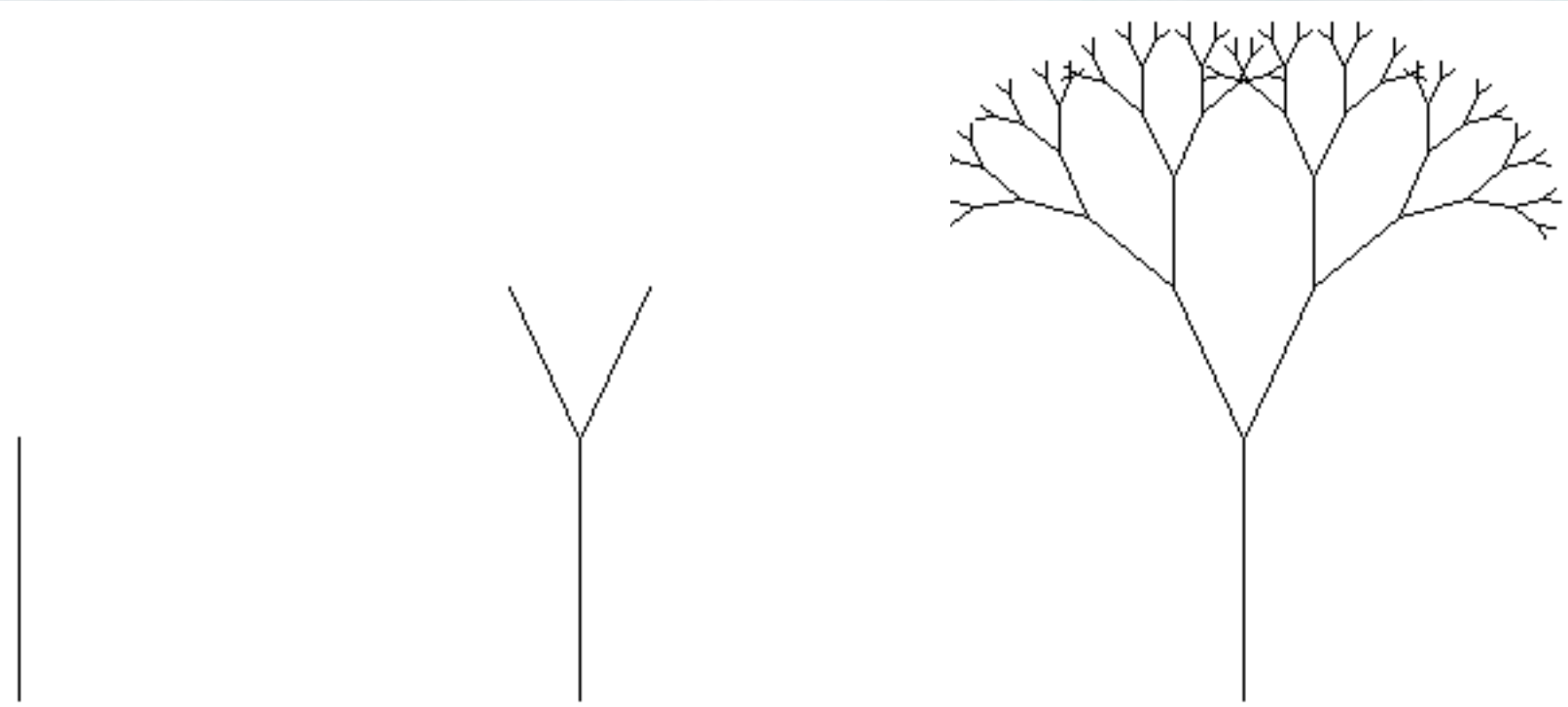
Part 2 - Fun with Fractals

- For this problem, you're going to draw fractal trees
  - Surprisingly little code
  - Surprisingly complex shape

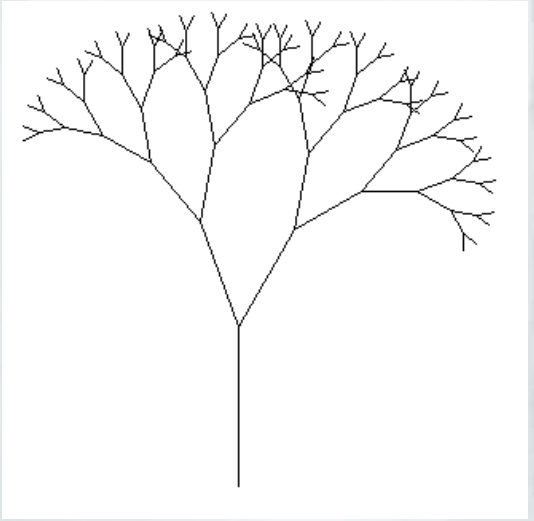


Part 2 - Fun with Fractals

- What is a fractal tree?
  - It's a trunk
  - With two smaller fractal trees attached



Part 2 - Fun with Fractals



- So how do we draw one?

- Write a function tree(levels, trunkLength)
  - Draws a fractal tree
  - And returns turtle to where it started

- Why do we care where our turtle ends up?
  - Want to use tree as a building block
  - (for the tree function itself)
  - After we call tree, want turtle to be where we left it

A Secret to Programming

- I don't have all the turtle functions memorized
  - I don't have all the basic Python functions memorized

- When you want to know how to do something basic
  - Use google
  - Online documentation
  - Code samples

A Secret to Programming

- Don't look up answers
  - Look up low level programming questions
- **GOOD**
  - How do I draw a line in Python?
  - How do I import the turtle module?
- **BAD**
  - How do I implement a caesar cipher?
  - How do I draw a fractal tree?
- Figure out what you want to code
  - Look up how to do the pieces