

CIS 122

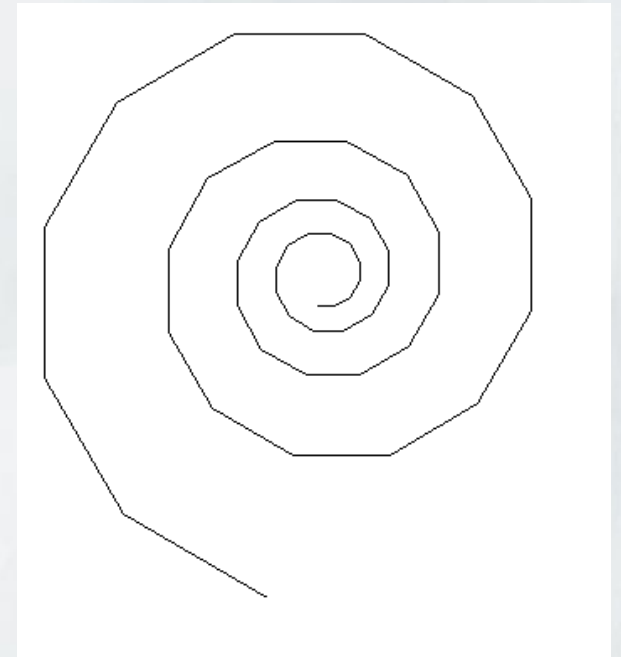
Turtle Assignment

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

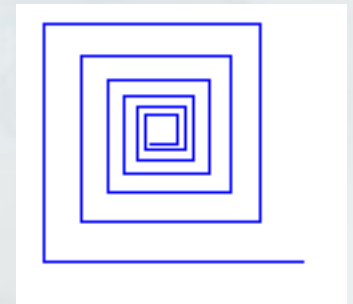
Part 1 - Spinning in Circles

- In this problem, you're going to write a spiral drawing function
 - The "rest" of a spiral is just another spiral
- 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



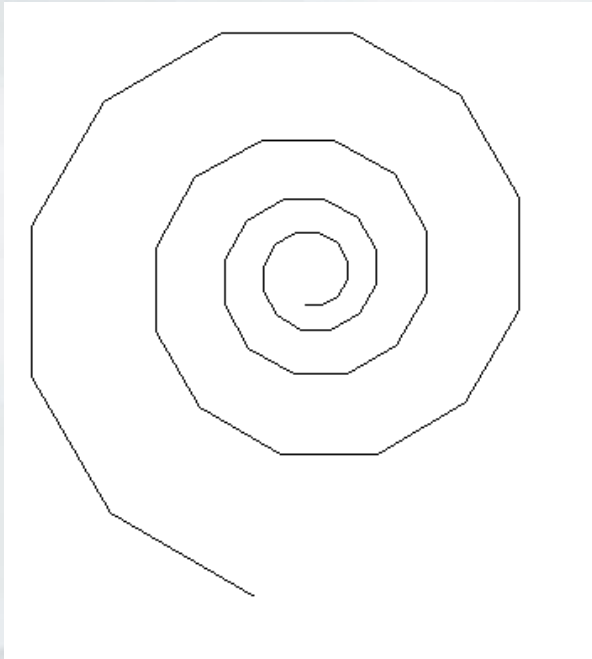
Part 1 - Spinning in Circles

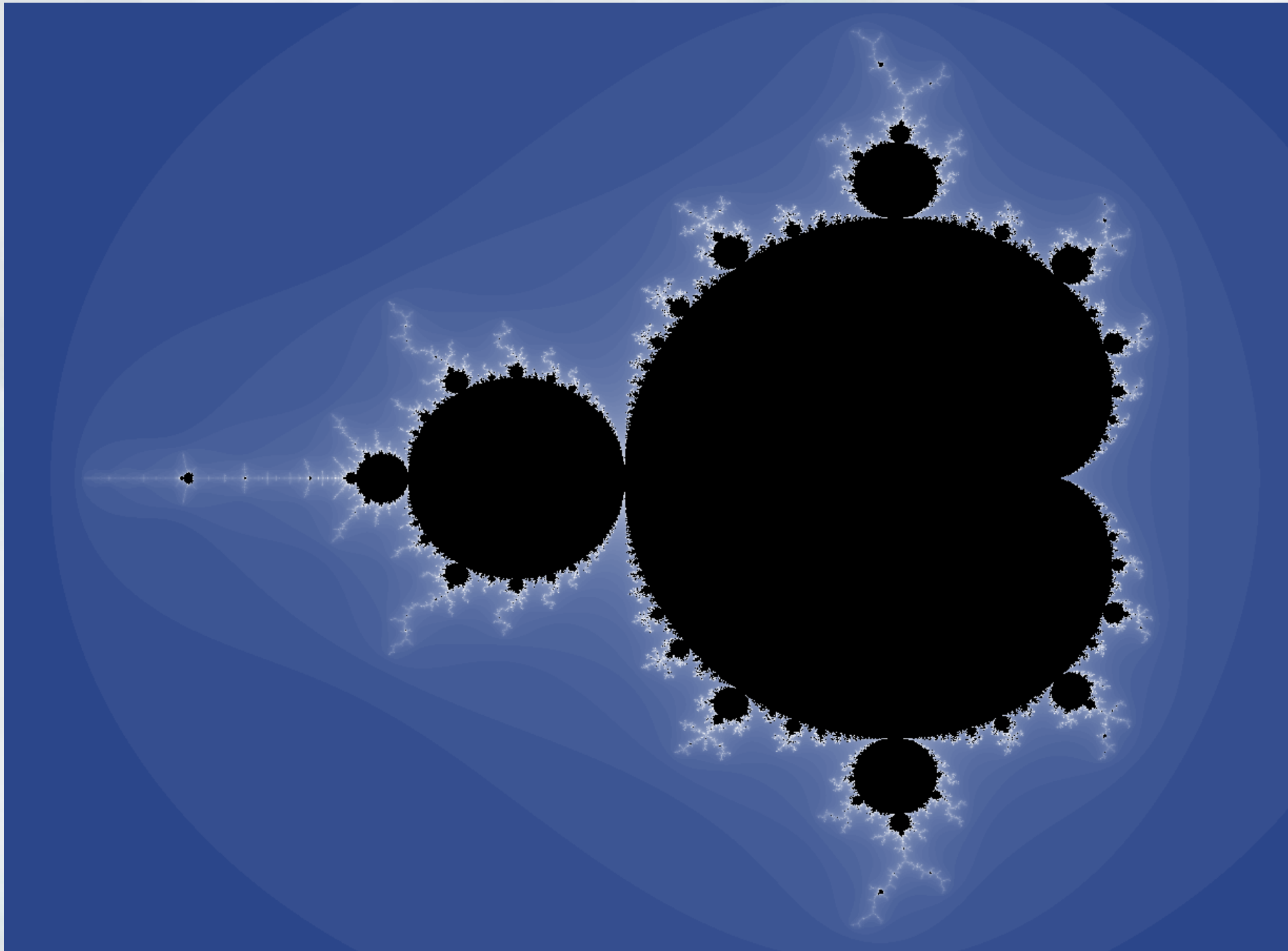
- What defines a spiral?
 - Initial side length
 - Side length modifier
 - Angle
- Our spiral function will take 3 arguments
 - spiral(**length**, **multiplier**, **angle**)
 - First side has given **length**
 - Each subsequent side grows by **multiplier**
 - Each subsequent side turns by **angle**



Part 2 - Fun with Fractals

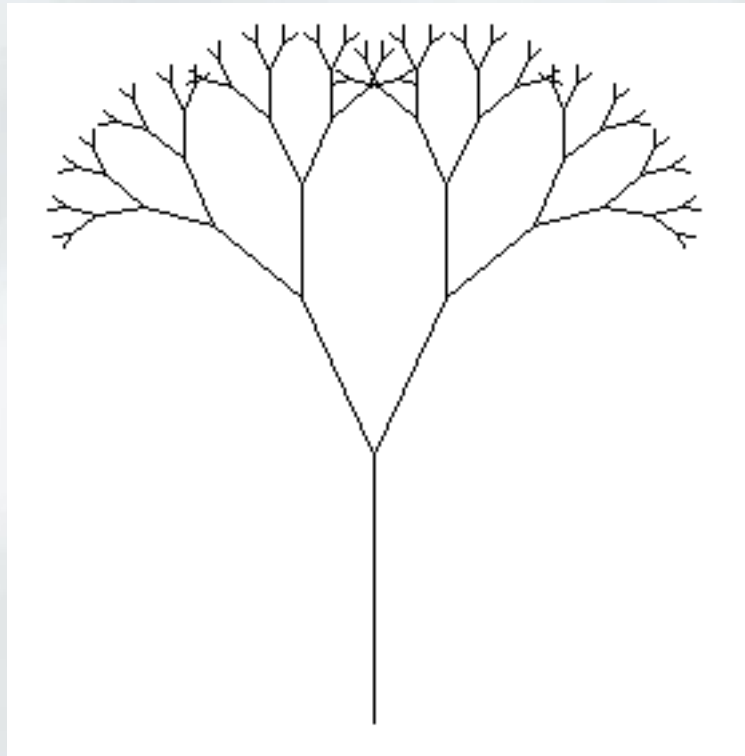
- What is a fractal
 - A self-similar shape
 - Part of the shape looks like the shape as a whole
- A spiral is a simple fractal
 - But they can be much more complicated





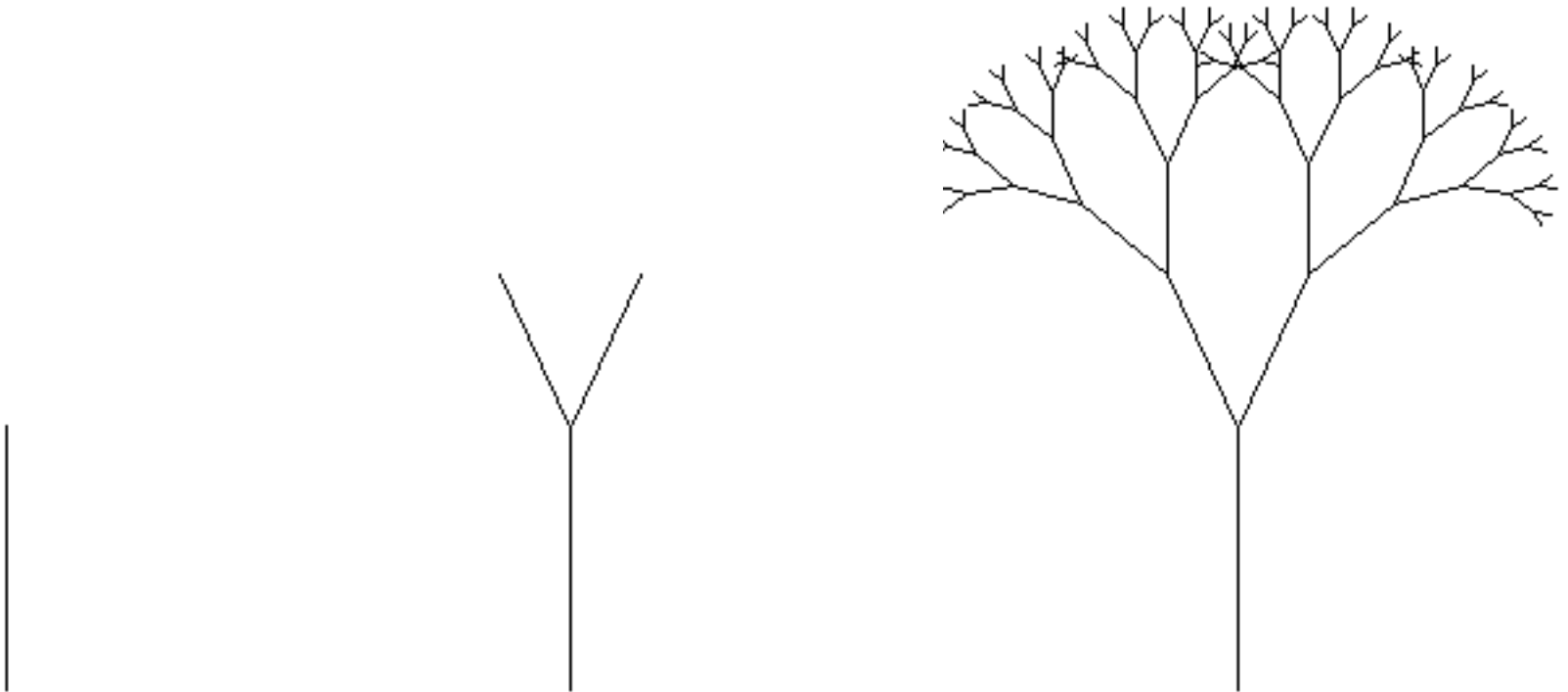
Part 2 - Fun with Fractals

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

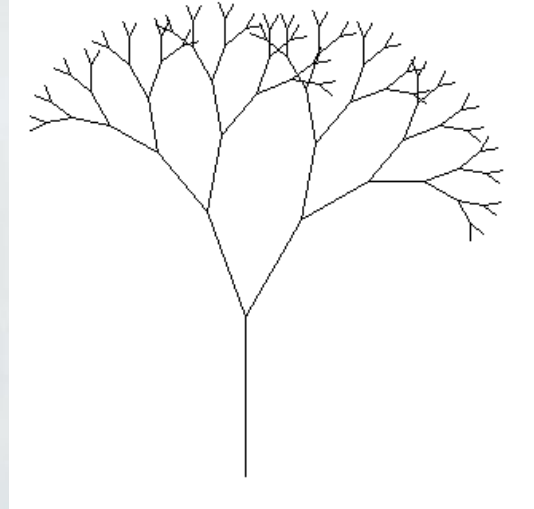


Part 2 - Fun with Fractals

- 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 `fractalTree(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 `fractalTree` as a building block
 - (for the `fractalTree` function itself)
 - Afterwards, we want our 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