Objective: Learn about functions in Python—What they are, why they matter, and how they work

Time: 2 hours

Materials: Zelle, Python Programming textbook, Ch. 6

Timeline:

*all examples saved in my Python folders for live demonstrations in-class

5:30-5:35 (5 min) –   Introduction, Administrative discussion, Questions about last week

5:35-5:50 (15 min) –   Discuss definition of "function" and basic parameter passing (6.1-6.4)

Example (1) - program that prints "Happy Birthday" song without functions, and then using a function to highlight the advantages

Example (2) – program that prints a second version of "Happy Birthday"

Discuss what's working and ask how we can condense these two similar functions even further

Example (3) – new function that combines examples 1 and 2 into a single function

Discuss passing of parameters to functions, as seen in Example (3) – how does it work, how it can be used to reduce the amount of code you write

5:50-5:55 (5 min) –   Pause for questions

5:55-6:10 (15 min) –   Discuss functions that return results (6.5-6.5.1)

Example (4) – a function that doesn't use return but you want to get a value back. Show why this doesn't work, even though you might expect it to.

Example (5) – same function, but now uses "return" and gives the expected value

Example (6) – function that uses "print" to print out a value instead of return

Discuss when it is appropriate to use return vs print and what the differences are between them

Example (7) – function that returns two separate values

Be sure to mention that you need two variables outside of the function call to catch both values returned, and that they will be assigned in the same order they appear

6:10-6:15 (5 min) – Pause for questions

6:15-6:30 (15 min) – Discuss nested functions (6.6)

Example (8) – function within another function

Show how you can define two functions, and have one function be called from inside the other function

Discuss the order of functions in your Python program – why you need to define both functions before you call them

6:30-6:40 (10 min) – Break

6:40-6:45 (5 min) – Pause for questions from last section or from first half of class so far

6:45-7:00 (15 min) – Discuss functions that modify parameters (6.5.2)

Example (9) – nested functions that don't modify parameters correctly, leading to unexpected results

Example (10) – correct version of nested functions that give expected results

7:00-7:05 (5 min) – Pause for questions

7:05-7:20 (15 mins) – Work through some example problems similar to what will be on the homework

7:20-7:30 (10 mins) – Discuss homework for next week, take final questions about this week's lesson

Homework: Selection of exercises from Zelle book and some of my own problems to highlight specific aspects of the lesson, Reading for next week's lesson