**Python for Everyone: Notes**

**Chapter 8: Python Lists**

* Programming
  + Algorithms
    - A set of rules or steps used to solve a problem
  + Data structure
    - A particular way of organizing data in a computer
* What is not a collection
  + Most of our variables have one value in them, when we put a new value in the variable, the old vale is overwritten
* A list of a kind of collection
  + A collection allows us to put many values in a single variable
  + A collection is nice because we can carry all many values around in one convenient package
* List constants
  + List constants are surrounded by square brackets and the elements in the list are separated by commas
  + A list element can be any python object, even another list
  + A list can be empty
* Looking inside lists
  + Just like strings, we can get at any single elements in a list using an index specified in square brackets
* Lists are mutable
  + Strings are “immutable” we cannot change the contents of a string, we must make a new string to make any changes
  + Lists are mutable, we can change an element of a list using the index operator
* How long is a list
  + The len() function takes a list as a parameter and returns the number of elements in the list
  + Actually len() tells us the number of elements of any set or sequence
* Using the range function
  + The range function returns a list of numbers that ranges from zero to one less than the parameter
  + We can construct an index loop using for and an integer iterator
* Concatenating lists using +
  + We can create a new list by adding two exisiting lists together
* Lists can be sliced using :
  + Remember: just like strings, the second number is up to but not including
* Building a list from scratch
  + We can create an empty list and then add elements using the append method
  + The list stays in order and new elements are added at the end of the list
* Is something in a list?
  + Python provides two operators that let you check if an item is in a list
  + These are logical operators that return True or False
  + They do not modify the list
* Lists are in order
  + A list can hold many items that keeps those items in the order until we do something to change the order
  + A list can be sorted
  + The sort method means sort yourself
* Built in functions and lists
  + There are a number of functions built into python that takes lists as parameters
  + Len(), max(), min(), sum(), sum()/len()
* Best friends: strings and lists
  + Split breaks a string into parts and produces a list of strings. We think of these as words. We can access a particular word or loop through all the words
  + When you do not specify a delimiter, multiple spaces are treated like one delimiter
  + You can specify what delimiter character to use in the splitting
* The double split pattern
  + Sometimes we split a new line one way, and then grab one of the pieces of the line and split that piece again