**Python for Everyone: Notes**

**Chapter 9: Python Dictionaries**

* What is a collection
  + A collection is nice because we can put more than one value in it and carry them all around in one convenient package
  + We have a bunch of values in a single “variable”
  + We do this by having more than one piece “in” the variable
  + We have ways of finding the different places in the variable
* 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 one is overwritten
* A story of two collections
  + List: a linear collection of values that stays in order
  + Dictionary: a bag of values, each with its own label
* Dictionaries
  + Dictionaries are python’s most powerful data collection
  + Dictionaries allow us to do fast database-like operations in python
  + Dictionaries have different names in different languages
    - Associatie Arrays – Perl / PHP
    - Properties or Map or HasMap – Java
    - Property Bag – C# / .NET
* Dictionaries
  + Lists index their entries based on their position in the list
  + Dictionaries are like bags, no order
  + So we index the things we put in the dictionary with a look up tag
* Comparing Lists and Dictionaries
  + Dictionaries are like lists except that they use keys instead of numbers to look up values
* Dictionary literals (constants)
  + Dictionary literals use curly braces and have a list of key : value pairs
  + You can make empty dictionary using empty curly braces {}
* Many counters with a dictionary
  + One common use of dictionaries is counting how often we see something
* Dictionary tracebacks
  + It is an error to reference a key which is not in the dictionary
  + We can use the in operator to see if a key is in the dictionary
* When we see a new name
  + When we encounter a new name, we need to add a new entry in the dictionary and if this is the second or later time we have seen the name, we simply add one to the count in the dictionary under the name
* The get method for dictionaries
  + The pattern of checking to see if a key is already in a dictionary and assuming a default value if the key is not there is so common that there is a method called get() that does this for us
  + Default value if key does not exist
* Simplified counting with get()
  + We can use get() and provide a default value of zero when the key is not yet in the dictionary and then just add one
* Counting pattern
  + The general pattern to count the words in a line of text is to split the line into words, the loop through the words and use a dictionary to track the count of each word independently
* Definite loops and dictionaries
  + Even though dictionaries are not stored in order, we can write a for loop that goes through all the entries in a dictionary – actually it goes through all of the keys in the dictionaries and looks up the values
* Retrieving lists of keys and values
  + You can get a list of keys, values, or items (both) from a dictionary
* Bonus: Two iteration variables
  + We loop through the key-value pairs in a dictionary using two iteration variables
  + Each iteration, the first variable is the key and the second variable is the corresponding value for the key