**COMP130 HW11: Dictionaries  
instructor: John MacCormick**

Question 1. (14 points) Consider the following code, which stores information about some professors’ office locations.

offices = dict()

offices['Twinkleton'] = 'Tome 234'

offices['Squeers'] = 'Tome 246'

offices['Gradgrind'] = 'Tome 229'

offices['Turveydrop'] = 'Althouse 106'

offices['Choakumchild'] = 'Rector North 1427'

(a) In the dictionary above, give one example of a key and one example of a value.

(b) Write a statement that prints Professor Turveydrop’s office location.

(c) Write statements that add Professor Biddy to the dictionary with an office in 'Rector North 2312' and then display the dictionary.

(d) Write statements that change Professor Gradgrind’s office to be 'Tome 242' and then display the dictionary.

(e) Write a statement that removes Professor Twinkleton and her office from the dictionary.

(f) Write a statement that prints True if there is a professor named Turveydrop in the dictionary, and False otherwise.

(g) Write a statement that prints True if there is an office at Tome 230 in the dictionary, and False otherwise.

Question 2. (15 points) This question continues work on the offices dictionary above.

(a) Write a function that prints all of the offices that appear in the dictionary, one per line.

(b) Write a function that prints out an office directory with one line per professor similar to: The office of Professor Squeers is Tome 246.

(c) Write a function that does a reverse lookup in the offices dictionary to display the name of the professor who has the office Tome 229.

In the remaining questions you will write programs that answer questions related to US city zip codes. To do so you will use the uszips.csv file provided with this assignment. This file is from the [United States Cities Database](https://simplemaps.com/data/us-cities) and is used under a [Creative Commons Attribution 4.0 license](https://creativecommons.org/licenses/by/4.0/).

Question 3. (5 points) Write a function that opens the uszips.csv file, then reads and prints the first 3 lines and then closes the file.

Question 4. (10 points) Write a function that opens the uszips.csv file, skips the first (header) line, reads the first line of data, splits it using the “,” delimiter, then prints out the zip code, the city and the state abbreviation that appear on that line; and finally, closes the file.

Question 5. (15 points) Write a function that returns a dictionary that maps from zipcode to a string holding the associated city and state abbreviation. For example, the key 17013 should map to 'Carlisle, PA'.

Question 6. (5 points) Write a function that uses the dictionary created in the previous question to print out the city and state for the zip codes 17013 and 90210.

Question 7. (15 points) Write a function that prints out the city and state for the zip codes between 17010 and 17020 inclusive. Your program should skip any zip codes that do not map to a city and should not generate any errors.

Question 8. (20 points) Write a function that returns a dictionary of counters that counts the number of zip codes for each state. Hint: Use the state abbreviation (e.g. 'PA') as the key and use the value to count how many zip codes are in that state.

Question 9. (5 points) Write a function that uses your dictionary from the previous question to display the number of zip codes in Pennsylvania.

Total points on assignment: 104