CSE 140 Section 9 Solutions

Question 1

This code will cause an error.
The function list.remove(x) removes the first value of x in the list, however it returns None. When the loop outer loop gets to the value of item = 2, item will be in items_to_remove, so after the line "somelist = somelist.remove(item)" somelist will then be None. Later, when item = 4, item will again be in items_to_remove. However, this time Python tries to do somelist.remove(item) somelist is None and it will therefore throw the error: "AttributeError: 'NoneType' object has no attribute 'remove'"

Question 2

2

Question 3

This code will cause an error.
The function histogram is given two strings. It then iterates through the first string with a for loop. When it does this, it goes through the loop letter by letter, not word by word. So, when the word "dime" is search for as a key in the dictionary, it doesn't appear in the dictionary.
Note: One way to go through the first given string word by word would be to slightly change the code to: "for w in words.split():"

Question 4

```
        def similar_pairs(list1, list2, similar):
                output = []
                for items in list1:
                        for values in list2:
                                if similar(items,values):
                                        output.append((items,values))
                return output
```

Question 5

```
def similar_number_vowels(string1, string2):
    vowels = ["A", "a", "E", "e", "I", "i", "O", "o", "U", "u"]

        vowels_first_string = 0
    for character in string1:
        if character in vowels:
            vowels_first_string += 1

        vowels_second_string = 0
        for letter in string2:
        if letter in vowels:
            vowels_second_string += 1

    return vowels_first_string == vowels_second_string

print similar_pairs(states,capitals,similar_number_vowels)
```

Question 6

```
## Iterative version
def contains(list_of_items, item_to_find):
"""Return True if item_to_find is in list_of_items.  Otherwise, return False."""
    for element in list_of_items:
        if element in item_to_find:
            return True

    return False
```

```
## Recursive version
def contains(list_of_items, item_to_find):
"""Return True if item_to_find is in list_of_items.  Otherwise, return False."""
    if list_of_items == []:
        return False
    elif list_of_items[0] == item_to_find:
        return True
    return contains(list_of_items[1:len(list_of_items)], item_to_find)
```

Question 7

a)

```
def read_csv(path):
        """
        Reads the CSV file at the given path and returns a list of dictionaries
        where the keys are: name, type, latitude, longitude
        """

def find_nearby_establishments(known_establishments, current_latitude,

                        current_longitude):
        """
        Given a list of dictionaries where the keys are name, type, latitude and
        longitude of a partiucular restaurant or bar, a float value of your current
        latitude and longitude returns a list of name of the restaurants less than
        0.007 degrees latitude/longitude of your current location.
        """
def find_population_location_of_bar(known_establishments):
        """
        Given a list of dictionaries where the keys are name, type, latitude and
        longitude of a partiucular restaurant or bar, examines the atitude and
        longitude of each bar to find a bar less than 0.007 degrees latitude/longitude
        of its location.
        """
```

b) Allows for reuuse of the find_nearby_establishments function.

c) find_nearby_establishments doesn’t give you any more information about the restaurants/bars that are close to you, aside from their names. The dictionary returned by read_csv doesn’t distinguish between bars and restuarants, so if you wanted information about one in particular you would have to look through the entire dictionary.

Question 8

a)

```
d = {}          #   "No error"

d[w] = "test"   #   "No error"

d[x] = "test"   #   "No error"

d[y] = "test"   #   "Error"

d[z] = "test"   #   "Error"
```

b) List and sets are mutable.
Keys of dictionaries must be immutable values.

Question 9

```
Global
gcd -> function

gcd
a       -> 15
b       -> 10

gcd
a       -> 5
b       -> 10

gcd
a       -> 10
b       -> 5

gcd
a       -> 5
b       -> 5

gcd
a       -> 0
b       -> 5

gcd
a       -> 5
b       -> 0
```