Homework 2

In this homework you will complete a couple of simple exercises in order to show your understanding with Python. If these exercises are challenging or new to you, you may want to reconsider taking the class and/or brush up on your Python skills. For the following exercises you are not allowed to use any Python packages (i.e. Numpy, Pandas, etc.).

Please print the output of each question in a new cell below your code

Lists

1.1 Create an empty Python list called 'a' in the cell below.

```
In [1]:  #your code here
         a = []
```

1.2 Store all values between 1-100 (inclusive) with increments of 3 (i.e. 1, 4, 7...) in 'a'.

```
In [2]:  #your code here
         for i in range(1,101,3):
             #using 101 because the specification is for 1-100 inclusive. The list needs to contain 100
             a.append(i)
         print (a)
```

```
[1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 88, 91, 94, 97, 100]
```

1.3 Create another list called 'a2' with numbers from 2-46 (inclusive) with increments of 0.5 (i.e. 2, 2.5, 3...).

```
In [3]: #your code here
        a2 = []
        for i in range (2*2,93):
            #I'd like for the bounds to be 2 and 46...
            a2.append(i/2)
            #see if there's a way to do this without converting all numbers to f
        loats
        print (a2)
```

```
[2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5,
9.0, 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, 13.5, 14.0, 14.5, 1
5.0, 15.5, 16.0, 16.5, 17.0, 17.5, 18.0, 18.5, 19.0, 19.5, 20.0, 20.5,
21.0, 21.5, 22.0, 22.5, 23.0, 23.5, 24.0, 24.5, 25.0, 25.5, 26.0, 26.5,
27.0, 27.5, 28.0, 28.5, 29.0, 29.5, 30.0, 30.5, 31.0, 31.5, 32.0, 32.5,
33.0, 33.5, 34.0, 34.5, 35.0, 35.5, 36.0, 36.5, 37.0, 37.5, 38.0, 38.5,
39.0, 39.5, 40.0, 40.5, 41.0, 41.5, 42.0, 42.5, 43.0, 43.5, 44.0, 44.5,
45.0, 45.5, 46.0]
```

1.4 Double every even integer element from list 'a'. Store the results back in 'a'.

```
In [4]: #your code here
        templist = []
        for item in a:
            templist.append(item*2)
            #you could also do this with a vector of 2s
        a = templist
        print (a)
```

```
[2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 104,
110, 116, 122, 128, 134, 140, 146, 152, 158, 164, 170, 176, 182, 188, 1
94, 200]
```

1.5 Add all numbers in 'a' except for the 2nd and 21st elements (the 2nd element here means the element at list index 1).

```
In [8]: #your code here
        sum = 0
        for item in a:
            if (a.index(item) == 1) or (a.index(item) == 20):
                #print ("1 then 21")
                sum +=0
            else:
                sum += item

        print (sum)
            #sum += item
```

```
3304
```

1.6 Calculate the mean of 'a'.

In [13]:
```python
#your code here
sum = 0
for item in a:
    sum +=item

#print (sum)
#print (len(a))

avg = sum/len(a)
print (avg)
```

```
101.0
```

1.7 Delete all elements greater than the mean value from list 'a'

In [14]:
```python
#your code here

#print (avg)

for item in a:
    if (item > avg):
        a.remove(item)
        #this is only removing one item per run...
    else:
        item = item

print (a)
```

```
101.0
[2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 110,
122, 134, 146, 158, 170, 182, 194]
```

Strings

2.1 Create an empty list called 'b'.

In [15]:
```python
#your code here
b = []
#done
```

2.2 Store the words in the sentence below as elements into the list 'b'.

'I am so excited about Data-X. It is important to be able to work with data.'

```
In [16]:  #your code here

          sentence = 'I am so excited about Data-X. It is important to be able to
           work with data.'

          for word in sentence.split():
             # print (word)
              b.append(word)

          for word in b:
              b[b.index(word)] = word.replace(".", "")


          print (b)
          #done
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-X', 'It', 'is', 'importan
t', 'to', 'be', 'able', 'to', 'work', 'with', 'data']
```

2.3 Return the count of the occurences of the lower-case letter 'e' in the list 'b'.

```
In [17]:  #your code here

          count_e_b = 0

          for word in b:
              for letter in word:
                  if letter == 'e' or 'b':
                      count_e_b += 1
                  else:
                      count_e_b = count_e_b
          print (count_e_b)
          #can't return since this isn't a member function :(

          #done
```

```
58
```

2.4 Replace every lower- or upper-case letter 'i' in the list b with a '1'.

```
In [18]:  #your code here


          for word in b:
              if ('i') in word:
                  b[b.index(word)] = (word.replace("i", "1"))

              if ('I') in word:
                  b[b.index(word)] = (word.replace("I", "1"))

          print (b)

          #done
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X', '1t', '1s', '1importan
t', 'to', 'be', 'able', 'to', 'work', 'w1th', 'data']
```

2.5 Append the string "This is the end of the first HW." to the list 'b'.

```
In [19]:  #your code here

          b.append ("This is the end of the first HW.")

          for word in b:
              b[b.index(word)] = word.replace(".", "")
              #sanitize the input to cut out "."

          #done
```

2.6 Print 'b' as ONE string backwards (starting with "WH tsrif...").

```
In [20]:  #your code here

          b.reverse()
          #print (b)
          temp = ""

          for word in b:
              temp += ((word[::-1]) + " ")
          print (temp)

          #done
```

```
WH tsrif eht fo dne eht si sihT atad ht1w krow ot elba eb ot tnatropm1
s1 t1 X-ataD tuoba det1cxe os ma 1
```

Dictionaries

3.1 Put the following in a dictionary called 'codes':

Keys: 1001, 1002, 1003, 1004, 1005
Values: 'Alpha', 'Beta', 'Gamma', 'Delta', 'Tau'

then traverse the dictionary by its keys and change every value to be all lower case.

```
In [32]: #your code here

         codes = {
             1001:'Alpha',
             1002: 'Beta',
             1003: 'Gamma',
             1004: 'Delta',
             1005: 'Tau'

         }

         for key,value in codes.items():
             codes[key] = value.lower()
             #print(value.lower())

         print (codes)
```

```
{1001: 'alpha', 1002: 'beta', 1003: 'gamma', 1004: 'delta', 1005: 'ta
u'}
```

3.2 Delete 'alpha' from the dictionary.

```
In [33]: #your code here

         codes.pop(1001)
         print (codes)
```

```
{1002: 'beta', 1003: 'gamma', 1004: 'delta', 1005: 'tau'}
```

Sets

4.1 Create a set called 'c' with the all the odd numbers less than 10.

```
In [28]: #your code here

         c = {1, 3, 5, 7, 9}

         print (c)
```

```
{1, 3, 5, 7, 9}
```

4.2 Create another set called 'd' with elements 2, 5, 10, 30.

```
In [27]:  #your code here

          d = {2, 5, 10, 30}

          print (d)
```

```
{2, 10, 5, 30}
```

4.3 Find the union between sets 'c' and 'd' and store this in a new set called 'e'.

```
In [25]:  #your code here

          e = {}

          e =  (c.union(d))


          print (e)
```

```
{1, 2, 3, 5, 7, 9, 10, 30}
```

4.4 Find the intersection between sets 'c' and 'd'.

```
In [26]:  #your code here

          print (c.intersection(d))
```

```
{5}
```