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 [21]:
```
#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 [61]:
```
#your code here
a=[x*3+1 for x in range(0,34)]
print(a)
```

```
[1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 5
5, 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 [13]:
```
#your code here
a2=[x*0.5 for x in range(4,93)]
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 [62]:
```
# your code here
for i in range(len(a)):
    if a[i]%2==0:
        a[i]=2*a[i]
print(a)
```

```
[1, 8, 7, 20, 13, 32, 19, 44, 25, 56, 31, 68, 37, 80, 43, 92, 49, 104,
55, 116, 61, 128, 67, 140, 73, 152, 79, 164, 85, 176, 91, 188, 97, 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 [57]:
```
#your code here
sum=0
for i in range(len(a)):
    sum=sum+a[i]
total=sum-a[1]-a[20]
print(total)
```

```
4292
```

1.6 Calculate the mean of 'a'.

In [58]:
```
#your code here

for i in range(len(a)):
    sum=sum+a[i]
mean=sum/(len(a)+1)
print(mean)
```

```
249.65714285714284
```

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

In [63]:
```
#your code here
for i in range(len(a)):
    if a[i]>mean:
        del a[i]
print(a)
```

```
[1, 8, 7, 20, 13, 32, 19, 44, 25, 56, 31, 68, 37, 80, 43, 92, 49, 104,
55, 116, 61, 128, 67, 140, 73, 152, 79, 164, 85, 176, 91, 188, 97, 200]
```

Strings

2.1 Create an empty list called 'b'.

In [ ]:
```
#your code here
b=list[]
```

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 [24]:
```
#your code here
string='I am so excited about Data-X. It is important to be able to work
 with data.'
b=string.split(" ")
b[5]='Data-x'
b[15]='data'
print(b)
print(type(b))
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-x', 'It', 'is', 'importan
t', 'to', 'be', 'able', 'to', 'work', 'with', 'data']
<class 'list'>
```

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

In [4]:
```
#your code here
num_e=0

for i in range(len(b)):
    num_e=num_e+b[i].count('e')

print(num_e)
```

```
4
```

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

In [19]:
```
#your code here
b=[x.replace('i','1') for x in b]

b=[x.replace('I','1') for x in b]

print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-x', '1t', '1s', '1mportan
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 [26]:
```
#your code here

string2="This is the end of the first HW"
b.append(string2)

print(b)
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-x', 'It', 'is', 'importan
t', 'to', 'be', 'able', 'to', 'work', 'with', 'data', 'This is the end
of the first HW']
```

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

In [27]:
```
#your code here
b_string=''.join(b)
b_string_reverse=b_string[::-1]
print(b_string_reverse)
```

```
WH tsrif eht fo dne eht si sihTatadhtiwkrowotelbaebottnatropmisitIx-ata
DtuobadeticxeosmaI
```

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 [118]:
```
#your code here
codes={1001:'Alpha',1002:'Beta',1003:'Gamma',1004:'Delta',1005:'Tau'}
print(codes)
```

```
{1001: 'Alpha', 1002: 'Beta', 1003: 'Gamma', 1004: 'Delta', 1005: 'Ta
u'}
```

3.2 Delete 'alpha' from the dictionary.

In [119]:
```
#your code here
del codes[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 [122]:
```
#your code here
c={1,3,5,7,9}
print(c)
```

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

Out[122]:
```
set
```

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

In [123]:
```
#your code here
d={2,5,10,30}
```

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

In [124]:
```
#your code here
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 [125]:
```
#your code here
print(c.intersection(d))
```

```
{5}
```