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.).

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Mandatory : Please print the output of each question below your code ¶

Lists

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

In [1]:

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

```
[1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 5
2, 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= [i/2 for i 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, 1
4.5, 15.0, 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, 3
1.5, 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
for i in range(0,len(a)):
    if a[i]%2==0:
        a[i]*=2
print (a)
```

```
[1, 8, 7, 20, 13, 32, 19, 44, 25, 56, 31, 68, 37, 80, 43, 92, 49, 10
4, 55, 116, 61, 128, 67, 140, 73, 152, 79, 164, 85, 176, 91, 188, 9
7, 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 and similarly for the 21st element).

In [5]:

```
#your code here
print(sum(a)-a[1]-a[20])
```

```
2532
```

1.6 Calculate the mean of 'a'.

In [6]:

```
#your code here
a_mean = sum(a)/len(a)
print(a_mean)
```

```
76.5
```

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

In [7]:

```
#your code here
b=[]
for i in range(len(a)):
    if a[i]<=a_mean:
        b.append(a[i])
a=b
print(a)
```

```
[1, 8, 7, 20, 13, 32, 19, 44, 25, 56, 31, 68, 37, 43, 49, 55, 61, 6
7, 73]
```

Strings

2.1 Create an empty list called 'b'.

In [8]:

```
#your code here
b=[]
print(b)
```

```
[]
```

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 [9]:

```
#your code here
b='I am so excited about Data-X. It is important to be able to work with data.'.
split(' ')
print(b)
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-X.', 'It', 'is', 'import
ant', '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 [10]:

```
#your code here
n=0
for w in b:
    n=n+w.count('e')
print (n)
```

```
4
```

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

In [11]:

```
#your code here
for i in range(len(b)):
    b[i]=b[i].replace('i','1')
    b[i]=b[i].replace('I','1')
print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mport
ant', '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 [12]:

```
#your code here
b=b+'This is the end of the first HW.'.split(' ')
print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mport
ant', 'to', 'be', 'able', 'to', 'work', 'w1th', 'data.', 'This', 'i
s', 'the', 'end', 'of', 'the', 'first', 'HW.']
```

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

In [13]:

```
#your code here
st=""
for w in b[::-1]:
    st=st+w[::-1]+" "
print(st)
```

```
.WH tsrif eht fo dne eht si sihT .atad ht1w krow ot elba eb ot tnatr
opm1 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 [14]:

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

```
{1001: 'alpha', 1002: 'beta', 1003: 'gamma', 1004: 'delta', 1005: 't
au'}
```

3.2 Delete 'alpha' from the dictionary.

In [15]:

```
#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 [16]:

```
#your code here
c=set([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 [17]:

```
#your code here
d=set([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 [18]:

```
#your code here
un = c | d
print (un)
```

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

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

In [19]:

```
#your code here
inter = c & d
print(inter)
```

```
{5}
```