

# Homework 0

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.).

## Lists

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

In [1]:

```
a=[]
```

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

In [3]:

```
for i in range (1,101,3):  
    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]
```

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

In [4]:

```
a2=[]  
for i in range (2,47):  
    a2.append(i)  
    if(i!=26):  
        a2.append(i+0.5)  
print(a2)
```

```
[2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, 15, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 20.5, 21, 21.5, 22, 22.5, 23, 23.5, 24, 24.5, 25, 25.5, 26]
```

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

In [5]:

```
for i in range (0,len(a),2):  
    a[i]=a[i]*2  
print(a)
```

```
[2, 4, 14, 10, 26, 16, 38, 22, 50, 28, 62, 34, 74, 40, 86, 46, 98, 52, 110,  
58, 122, 64, 134, 70, 146, 76, 158, 82, 170, 88, 182, 94, 194, 100, 2, 4, 1  
4, 10, 26, 16, 38, 22, 50, 28, 62, 34, 74, 40, 86, 46, 98, 52, 110, 58, 122,  
64, 134, 70, 146, 76, 158, 82, 170, 88, 182, 94, 194, 100]
```

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

In [6]:

```
sum(a)-a[1]-a[20]
```

Out[6]:

4974

Calculate the mean of 'a'.

In [7]:

```
sum(a)/len(a)
```

Out[7]:

75.0

## Strings

Create an empty list called 'b'.

In [8]:

```
b=[]
```

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]:

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

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

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

In [10]:

```
count = 0
for i in range (0,len(b)):
    if(b[i].count("e")):
        count+=b[i].count("e")
print(count)
```

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

In [11]:

```
b = [i.replace('i','1') for i in b]
b = [i.replace('I','1') for i in b]
print(b)
```

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

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

In [12]:

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

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mportant', 't
o', 'be', 'able', 'to', 'work', 'w1th', 'data.', 'This is the end of the fir
st HW']
```

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

In [13]:

```
ONE = " ".join(b)
print(ONE[::-1])
```

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

## Dictionaries

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 [17]:

```
codes = {'1001': 'Alpha', '1002' : 'Beta', '1003' : 'Gamma', '1004' : 'Delta', '1005' : 'Tau'}
for key in codes.keys():
    codes[key]=codes[key].lower()
print(codes)
```

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

Delete 'alpha' from the dictionary.

In [18]:

```
del codes['1001']
print(codes)
```

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

## Sets

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

In [19]:

```
l = list(range(1,10,2))
c= set(l)
print(c)
```

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

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

In [20]:

```
d={2,5,10,30}
print(d)
```

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

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

In [22]:

```
e=c.union(d)
print(e)
```

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

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