Data-X IEOR 290: HW1

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Problem 1

In [1]:
```
a = []
```

In [2]:
```
print (a)
```

```
[]
```

In [3]:
```
lowerLimit = 2
upperLimit = 46
a = [x*0.5 for x in range(2*lowerLimit,2*upperLimit+1)]
```

In [4]:
```
print (a)
```

```
[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, 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, 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]
```

In [5]:
```
def double_evens(arr):
    output = []
    for i in arr:
        if i%2 == 0:
            output.append(i*2)
        if i%2 != 0:
            output.append(i)
    return output
```

In [6]:
```
a = double_evens(a)
```

In [7]:
```
print (a)
```

```
[4.0, 2.5, 3.0, 3.5, 8.0, 4.5, 5.0, 5.5, 12.0, 6.5, 7.0, 7.5, 16.0, 8.5,
 9.0, 9.5, 20.0, 10.5, 11.0, 11.5, 24.0, 12.5, 13.0, 13.5, 28.0, 14.5, 1
5.0, 15.5, 32.0, 16.5, 17.0, 17.5, 36.0, 18.5, 19.0, 19.5, 40.0, 20.5, 2
1.0, 21.5, 44.0, 22.5, 23.0, 23.5, 48.0, 24.5, 25.0, 25.5, 52.0, 26.5, 2
7.0, 27.5, 56.0, 28.5, 29.0, 29.5, 60.0, 30.5, 31.0, 31.5, 64.0, 32.5, 3
3.0, 33.5, 68.0, 34.5, 35.0, 35.5, 72.0, 36.5, 37.0, 37.5, 76.0, 38.5, 3
9.0, 39.5, 80.0, 40.5, 41.0, 41.5, 84.0, 42.5, 43.0, 43.5, 88.0, 44.5, 4
5.0, 45.5, 92.0]
```

In [8]:
```
def add(arr):
    total = 0
    for i in arr:
        total += i
    return total
```

In [9]:
```
add(a)
```

Out[9]: 2688.0

In [10]:
```
add(a)-a[31]-a[50]
```

Out[10]: 2643.5

In [11]:
```
sum(a)-a[31]-a[50]
```

Out[11]: 2643.5

In [12]:
```
def mean(arr):
    average = sum(arr)/len(arr)
    return average
```

In [13]:
```
mean(a)
```

Out[13]: 30.202247191011235

In [14]:
```
def get_halves(arr):
    output = []
    for i in arr:
        if str(i-int(i)) == '0.5':
            output.append(i)
    return output
```

In [15]:
```
def get_integers(arr):
    output = []
    for i in arr:
        if str(i-int(i)) == '0.0':
            output.append(i)
    return output
```

In [16]:
```
a_half = get_halves(a)
```

In [17]:
```
print (a_half)
```

```
[2.5, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5, 10.5, 11.5, 12.5, 13.5, 14.5, 1
5.5, 16.5, 17.5, 18.5, 19.5, 20.5, 21.5, 22.5, 23.5, 24.5, 25.5, 26.5, 2
7.5, 28.5, 29.5, 30.5, 31.5, 32.5, 33.5, 34.5, 35.5, 36.5, 37.5, 38.5, 3
9.5, 40.5, 41.5, 42.5, 43.5, 44.5, 45.5]
```

In [18]:
```
def sort_halves(arr):
    output1 = []
    output2 = []
    for i in arr:
        if str(i-int(i)) == '0.5':
            output2.append(i)
        if str(i-int(i)) == '0.0':
            output1.append(i)
    return output1 + output2
```

In [19]:
```
a = sort_halves(a)
print (a)
```

```
[4.0, 3.0, 8.0, 5.0, 12.0, 7.0, 16.0, 9.0, 20.0, 11.0, 24.0, 13.0, 28.0,
 15.0, 32.0, 17.0, 36.0, 19.0, 40.0, 21.0, 44.0, 23.0, 48.0, 25.0, 52.0,
 27.0, 56.0, 29.0, 60.0, 31.0, 64.0, 33.0, 68.0, 35.0, 72.0, 37.0, 76.0,
 39.0, 80.0, 41.0, 84.0, 43.0, 88.0, 45.0, 92.0, 2.5, 3.5, 4.5, 5.5, 6.5,
 7.5, 8.5, 9.5, 10.5, 11.5, 12.5, 13.5, 14.5, 15.5, 16.5, 17.5, 18.5, 19.
5, 20.5, 21.5, 22.5, 23.5, 24.5, 25.5, 26.5, 27.5, 28.5, 29.5, 30.5, 31.
5, 32.5, 33.5, 34.5, 35.5, 36.5, 37.5, 38.5, 39.5, 40.5, 41.5, 42.5, 43.
5, 44.5, 45.5]
```

In [20]:
```
print (a[0::4])
```

```
[4.0, 12.0, 20.0, 28.0, 36.0, 44.0, 52.0, 60.0, 68.0, 76.0, 84.0, 92.0,
 5.5, 9.5, 13.5, 17.5, 21.5, 25.5, 29.5, 33.5, 37.5, 41.5, 45.5]
```

In [21]:
```
len(get_halves(a))
```

Out[21]: 44

In [22]:
```
len(get_integers(a))
```

Out[22]: 45

Problem 2

In [23]:
```
b = []
```

In [24]:
```
sentence = "I am so excited about Data-X. I feel it is important to be able
```

In [25]:
```
b = sentence.split()
print (b)
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-X.', 'I', 'feel', 'it', 'is',
 'important', 'to', 'be', 'able', 'to', 'work', 'with', 'data']
```

In [26]:
```
def letter_count(word, letter):
    occurences=0
    for i in word:
        occurences += i.count(letter)
    return occurences
```

In [27]:
```
letter_count(b,'e')
```

Out[27]:
```
6
```

In [28]:
```
b = [i.replace('i', '1').replace('I', '1') for i in b ]
print (b)
```

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

In [29]:
```
b = b + "This is the end of the first HW".split()
print (b)
```

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

In [30]:
```
b = [ i[::-1] for i in b]
print (b)
```

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

In [31]:
```
b = [" ".join(b)]
print (b)
```

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

In [32]:
```
b = b[0].split()
b = [" ".join(reversed(b))]
print (b)
```

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