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.).

NAME : Shun Lin

ID : 26636176

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 [2]:
```
#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 [3]:
```
#your code here
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]
```

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 [8]:
```
#your code here
a2 = []
i = 2
while i <= 46:
    a2.append(i)
    i += 0.5
print(a2)
```

```
[2, 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, 1
5.5, 16.0, 16.5, 17.0, 17.5, 18.0, 18.5, 19.0, 19.5, 20.0, 20.5, 21.0, 2
1.5, 22.0, 22.5, 23.0, 23.5, 24.0, 24.5, 25.0, 25.5, 26.0, 26.5, 27.0, 2
7.5, 28.0, 28.5, 29.0, 29.5, 30.0, 30.5, 31.0, 31.5, 32.0, 32.5, 33.0, 3
3.5, 34.0, 34.5, 35.0, 35.5, 36.0, 36.5, 37.0, 37.5, 38.0, 38.5, 39.0, 3
9.5, 40.0, 40.5, 41.0, 41.5, 42.0, 42.5, 43.0, 43.5, 44.0, 44.5, 45.0, 4
5.5, 46.0]
```

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

In [10]:
```
#your code here
a = [i * 2 for i in a]
print(a)
```

```
[2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 104, 1
10, 116, 122, 128, 134, 140, 146, 152, 158, 164, 170, 176, 182, 188, 194,
200, 2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 10
4, 110, 116, 122, 128, 134, 140, 146, 152, 158, 164, 170, 176, 182, 188,
194, 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 [11]:
```
#your code here
ans = sum(a) - a[1] - a[20]
print(ans)
```

```
6738
```

1.6 Calculate the mean of 'a'.

In [12]:
```
#your code here
ans = sum(a) / len(a)
print(ans)
```

```
101.0
```

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

In [13]:
```
#your code here
mean = sum(a) / len(a)
temp = []
for ele in a:
    if ele <= mean:
        temp.append(ele)
a = temp
print(a)
```

```
[2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 2, 8,
14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98]
```

Strings

2.1 Create an empty list called 'b'.

In [14]:
```
#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 [15]:
```
#your code here
sentence = 'I am so excited about Data-X. It is important to be able to worl
for word in sentence.split():
    b.append(word)
print(b)
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-X.', 'It', 'is', 'important',
'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 [16]:
```
#your code here
count = 0
for word in b:
    count += word.count('e')
print(count)
```

```
4
```

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

In [22]:
```
#your code here
for i in range(0, len(b)):
    word = b[i]
    word = word.replace('i', '1')
    word = word.replace('I', '1')
    b[i] = word
print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mportant',
'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 [23]:
```
#your code here
additional_sentence = "This is the end of the first HW."
for word in additional_sentence.split():
    b.append(word)
print(b)
```

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

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

In [29]:
```
#your code here
print(' '.join([ele[::-1] for ele in b[::-1]]))
```

```
.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 [30]:
```
#your code here
codes = dict()
codes[1001] = 'Alpha'
codes[1002] = 'Beta'
codes[1003] = 'Gamma'
codes[1004] = 'Delta'
codes[1005] = 'Tau'
print(codes)
```

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

3.2 Delete 'alpha' from the dictionary.

In [33]:
```
#your code here
if 1001 in codes:
    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 [37]:
```
#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 [38]:
```
#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 [40]:
```
#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 [43]:
```
#your code here
intersection = c.intersection(d)
print(intersection)
```

```
{5}
```

In [ ]:
```

```