Homework 2

January 26, 2019

1 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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1.0.3 Mandatory : Please print the output of each question below your code

1.1 Lists

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

```
In [67]: #your code here
         a = []
         a
```

```
Out[67]: []
```

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

```
In [1]: #your code here
        a = [x for x in range(1,101) if (x-1)%3 == 0]
        a
```

```
Out[1]: [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 [10]: #your code here
         a2 = []
         x=2
         while x <= 46:
             a2.append(x)
             x += .5

         a2
```

```
Out[10]: [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,
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 [5]: #your code here
        a = [2*x for x in a]
        a

Out[5]: [4,
         16,
         28,
         40,
         52,
         64,
         76,
         88,
         100,
         112,
         124,
```

```
136,
148,
160,
172,
184,
196,
208,
220,
232,
244,
256,
268,
280,
292,
304,
316,
328,
340,
352,
364,
376,
388,
400]
```

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 [23]: #your code here
         num = 0
         for x in a:
             if not a[1] or a[20]:
                 num += x
         num
```

```
Out[23]: 6868
```

1.6 Calculate the mean of 'a'.

```
In [20]: #your code here
         avg = sum(a)/len(a)
         avg
```

```
Out[20]: 202.0
```

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

```
In [31]: #your code here
         a = [x for x in a if x < avg]
         a
```

```
Out[31]: [4, 16, 28, 40, 52, 64, 76, 88, 100, 112, 124, 136, 148, 160, 172, 184, 196]
```

1.2 Strings

2.1 Create an empty list called 'b'.

```
In [68]: #your code here
         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 [30]: #your code here
         s = 'I am so excited about Data-X. It is important to be able to work with data.'
         b = s.split(' ')
         b
```

```
Out[30]: ['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 [33]: #your code here
         num2 = 0
         for x in b:
             num2 += x.count('e')
         num2
```

```
Out[33]: 4
```

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

```
In [48]: #your code here
         b = [x.replace('i','1') for x in b]
         b = [x.replace('I','1') for x in b]
         b
```

```
Out[48]: ['1',
          'am',
          'so',
          'exc1ted',
          'about',
          'Data-X.',
          '1t',
          '1s',
          '1mportant',
          'to',
          'be',
          'able',
          'to',
          'work',
          'w1th',
          'data.',
          'Th1s 1s the end of the f1rst HW.']
```

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

```
In [38]: #your code here
         b.append("This is the end of the first HW.")
         b
```

```
Out[38]: ['I',
          'am',
          'so',
          'excited',
          'about',
          'Data-X.',
          'It',
          'is',
          'important',
          '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 [41]: #your code here
         string = ''
         for x in b[::-1]:
             string += x[::-1] + ' '
         string
```

```
Out[41]: '.WH tsrif eht fo dne eht si sihT .atad htiw krow ot elba eb ot tnatropmi si tI .X-ata
```

1.3 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 [58]: #your code here
         codes = {
             1001:'Alpha',
             1002:'Beta',
             1003:'Gamma',
             1004:'Delta',
             1005:'Tau'
         }
         for x in codes:
             codes[x] = codes[x].lower()

         codes

Out[58]: {1001: 'alpha', 1002: 'beta', 1003: 'gamma', 1004: 'delta', 1005: 'tau'}
```

3.2 Delete 'alpha' from the dictionary.

```
In [59]: #your code here
         codes.pop(1001)
         codes

Out[59]: {1002: 'beta', 1003: 'gamma', 1004: 'delta', 1005: 'tau'}
```

1.4 Sets

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

```
In [61]: #your code here
         c = {1,3,5,7,9}
```

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

```
In [62]: #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 [65]: #your code here
         e = c.union(d)
         e

Out[65]: {1, 2, 3, 5, 7, 9, 10, 30}
```

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

In [66]:
```
#your code here
c.intersection(d)
```

Out[66]:
```
{5}
```

In [ ]: