HW2 Python Review

September 3, 2018

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.).

1.0.1 Please print the output of each question in a new cell below your code

1.1 Lists

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

```
In [36]: a = []
```

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

```
In [37]: i = 1
         while i <= 100:
             a.append(i)
             i += 3
         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,
```

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 [38]: a2 = []
         i = 2
         while i <= 46:
             a2.append(i)
             i += .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
```

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

```
In [39]: #your code here
         a = [2*i for i in a]
         print(a)
```

```
[2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 104, 110, 116, 122, 128, 134
```

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).

```
In [40]: print(sum(a) - a[1] - a[20])
```

```
3304
```

1.6 Calculate the mean of 'a'.

```
In [41]: import numpy as np
         print(np.mean(a))
```

```
101.0
```

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

```
In [43]: hold = []
         for i in a:
             if i <= np.mean(a):
                 hold.append(i)
         a = hold
         print(a)
```

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

1.2 Strings

2.1 Create an empty list called 'b'.

```
In [44]: #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 [78]: #your code here
         b = 'I am so excited about Data-X. It is important to be able to work with data.'.spli
         print(b)
```

```
['I', 'am', 'so', 'excited', 'about', 'Data-X.', 'It', 'is', 'important', 'to', 'be', 'able',
```

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

```
In [79]: #your code here
         print(sum([i.count('e') for i in b]))
```

```
4
```

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

```
In [80]: #your code here
         b = [i.replace('i', '1').replace('I','1') for i in b]
         print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mportant', 'to', 'be', 'able',
```

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

```
In [81]: b.extend("This is the end of the first HW.".split())

         print(b)
```

```
['1', 'am', 'so', 'exc1ted', 'about', 'Data-X.', '1t', '1s', '1mportant', 'to', 'be', 'able',
```

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

```
In [82]: #your code here
         b = (' '.join(word for word in b))[::-1]
         print(b)
```

```
.WH tsrif eht fo dne eht si sihT .atad ht1w krow ot elba eb ot tnatropm1 s1 t1 .X-ataD tuoba d
```

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

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

3.2 Delete 'alpha' from the dictionary.

```
In [97]: #your code here
         codes = codes.pop(1001)
```

```
alpha
```

1.4 Sets

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

```
In [102]: #your code here
          prec = []
          for i in np.arange(10):
              if not i % 2 == 0:
                  prec.append(i)
          c = set(prec)
          print(c)
```

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

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

```
In [105]: #your code here
          d = [2,5,10,30]
          print(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 [106]: #your code here
          e = list(set(c) | set(d))
          print(e)
```

```
Out[106]: [1, 2, 3, 5, 7, 9, 10, 30]
```

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

```
In [107]: #your code here
          list(set(c) & set(d))
```

```
Out[107]: [5]
```