HW2_Python_Review

September 4, 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 [1]: a = []
```

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

```
In [2]: 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
```

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 [3]: a2 = [i * 0.5 for i in range (4, 93)]
        print(a2)
```

```
[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.
```

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

```
In [4]: a_length = len(a)
        for i in range(a_length):
            if a[i] % 2 == 0:
                a.append(a[i] * 2)
        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
```

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 [5]: s = 0
        for i, element in enumerate(a):
            if i != 1 and i != 20:
                s += element
        print(s)
```

```
3420
```

1.6 Calculate the mean of 'a'.

```
In [6]: mean = sum(a)/len(a)
        print(mean)
```

```
68.33333333333333
```

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

```
In [7]: i = 0
        while i < len(a):
            if a[i] > mean:
                del a[i]
                continue
            i += 1
        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, 8, 20,
```

1.2 Strings

2.1 Create an empty list called 'b'.

```
In [8]: 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 [9]: phrase = 'I am so excited about Data-X. It is important to be able to work with data.'

        word = ""
        for character in phrase:
            if word != "" and (character == " " or character == "."):
```

```
            b.append(word)
            word = ""
        elif character != " " or character == ".":
            word += character

    print(b)
```

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

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

```
In [10]: n_e = 0
         for word in b:
             for character in word:
                 if character == 'e':
                     n_e += 1
         n_e
```

```
Out[10]: 4
```

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

```
In [11]: for i, word in enumerate(b):
             b[i] = word.replace('i', '1').replace('I', '1')

         print(b)
```

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

2.5 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', 'to', 'be', 'able', 'to
```

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

```
In [13]: backward_b = "".join(b)[::-1]
         print(backward_b)
```

```
.WH tsrif eht fo dne eht si sihTatadht1wkrowotelbaebottnatropm1s1t1X-ataDtuobadet1cxeosma1
```

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 [14]: 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'}
```

3.2 Delete 'alpha' from the dictionary.

```
In [15]: # Deleting 'alpha' also means deleting the key associated because it only has one eleme
         del codes[1001]
         print(codes)
```

```
{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 [16]: c = {i for i in range(10) if i%2 == 1}
         print(c)
```

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

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

```
In [17]: 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 [18]: e = set.union(c, d)
         print(e)
```

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

4.4 Find the intersection between sets ‘c’ and ‘d’.

```
In [19]: intersection = set.intersection(c, d)
         print(intersection)
```

```
{5}
```