Data Structures

1. Lists

Reference:- https://www.youtube.com/watch?v=ohCDWZgNIU0 (https://www.youtube.com/watch?v=ohCDWZgNIU0)

1+1+1 = 3 points

1.1 Create an empty list with the name 'a', print the value of a and type(a).

In [149]:

```
# create empty list, name it 'a'
```

In [147]:

```
# print the value of a
```

```
[]
```

In [148]:

```
# print the type of a
```

Out[148]:

```
list
```

1.2.Create a list , languages = ['R','Python', 'SAS', 'Scala', 42],

1+1+1+1+1+1+1+1 = 7 points

In [5]:

```
#code here
```

Print the number of elements in the list

In [6]:

```
#code here
```

Out[6]:

```
5
```

Using for loop iterate and print all the elements in the list

In [7]:

```
#code here
```

```
R
Python
SAS
Scala
42
```

Select the second item, 'Python' and store it in a new variable named 'temp'

In [8]:

```
#code here
```

Print the value of temp and type(temp)

In [10]:

```
#code here
```

```
Python
<class 'str'>
```

Using list comprehension, print the last two elemets of list

In [11]:

```
# code here
```

Out[11]:

```
['Scala', 42]
```

Append the element 'Java' in the list

In [12]:

```
#code here
```

Remove the element 42 from the list and print the list

In [151]:

```
#code here
```

```
['R', 'Python', 'SAS', 'Scala', 'Java']
```

1.3. Create a list, colors = [‘Red’, ‘Blue’, ‘White’]

1+1+1+1+1+1+1 = 6 points

In [27]:

```
#code here
```

Append the element 'Black' to colors

In [28]:

```
#code here
```

Append the color 'Orange' to second position (index=1) and print the list

In [29]:

```
# code here
```

Print the list

In [30]:

```
# code here
```

Out[30]:

```
['Red', 'Orange', 'Blue', 'White', 'Black']
```

Create another list, colors2 = [‘Grey’, ‘Sky Blue’]

In [31]:

```
# code here
```

Add the elements of colors2 to colors using extend function in the list

In [32]:

```
#code here
```

Print len of colors and its elements

In [33]:

```
# code here
```

```
7
['Red', 'Orange', 'Blue', 'White', 'Black', 'Grey', 'Sky Blue']
```

Sort the list and print it.

In [34]:

```
# code here
```

```
['Black', 'Blue', 'Grey', 'Orange', 'Red', 'Sky Blue', 'White']
```

1.4. Create a string, sent = 'Coronavirus Caused Lockdowns Around The World."

7 points

In [41]:

```
# code here
```

Use split function to convert the string into a list of words and save it in variable words and print the same

In [43]:

```
# code here
```

```
['Coronavirus', 'Caused', 'Lockdowns', 'Around', 'The', 'World.']
```

Using list comprehensions, convert each word in the list to lower case and store it in variable words_lower. Print words_lower

In [52]:

```
# code here
```

```
['coronavirus', 'caused', 'lockdowns', 'around', 'the', 'world.']
```

Check whether 'country' is in the list

In [53]:

```
# code here
```

Out[53]:

```
False
```

Remove the element 'the' from the list and print the list.

In [152]:

```
# code here
```

```
['coronavirus', 'caused', 'lockdowns', 'around', 'world.']
```

Select the first 4 words from the list words_lower using slicing and store them in a new variable x4

In [55]:

```
#code here
```

In [57]:

```
# print x4
```

```
['coronavirus', 'caused', 'lockdowns', 'around']
```

Convert the list of elements to single string using join function and print it

In [60]:

```
#code here
```

Out[60]:

```
'coronavirus caused lockdowns around'
```

2. Sets

Reference:-https://www.youtube.com/watch?v=sBvaPopWOmQ (https://www.youtube.com/watch?v=sBvaPopWOmQ)

2.1. Create stud_grades = ['A','A','B','C','C','F']

7 points

In [154]:

```
#code here
```

Print the len of stud_grades

In [155]:

```
#code here
```

6

Create a new variable, stud_grades_set = set(stud_grades)

In [156]:

```
#code here
```

Print stud_grades_set.

In [157]:

```
#code here
```

```
{'A', 'B', 'F', 'C'}
```

print the type of stud_grades and stud_grades_set and print their corresponding elements. Try to understand the difference between them.

In [158]:

```
#code here
```

```
<class 'list'> ['A', 'A', 'B', 'C', 'C', 'F']
<class 'set'> {'A', 'B', 'F', 'C'}
```

Add a new element ‘G’ to stud_grades_set

In [159]:

```
#code here
```

Add element 'F' to stud_grades_set. and print it.

In [160]:

```
#code here
```

```
{'G', 'A', 'B', 'F', 'C'}
```

!!Did you notice? set doesn't add an element if it's already present in it, unlike lists.

Remove ‘F’ from stud_grades_set

In [161]:

```
#code here
```

Print the elements and the length of stud_grades_set

In [162]:

```
#code here
```

```
{'G', 'A', 'B', 'C'}
4
```

2.2. Create colors = [‘red’,’blue’,’orange’], and fruits = [‘orange’,’grapes’,’apples’]

6 points

In [82]:

```
#code here
```

Print color and fruits

In [166]:

```
#code here
```

```
['red', 'blue', 'orange']
['orange', 'grapes', 'apples']
```

Create colors_set, and fruits_set. (using set()) and print them

In [86]:

```
#code here
```

```
{'blue', 'orange', 'red'}
{'grapes', 'orange', 'apples'}
```

Find the union of both the sets.

In [87]:

```
#code here
```

Out[87]:

```
{'apples', 'blue', 'grapes', 'orange', 'red'}
```

Find the intersection of both the sets

In [89]:

```
#code here
```

Out[89]:

```
{'orange'}
```

Find the elements which are Fruits but not colors (using set.difference())

In [91]:

```
#code here
```

Out[91]:

```
{'apples', 'grapes'}
```

3. TUPLES

Reference:-https://www.youtube.com/watch?v=NI26dqhs2Rk (https://www.youtube.com/watch?v=NI26dqhs2Rk)

3.1 . Create temp = [17, 'Virat', 50.0]

7 points

In [94]:

```
#code here
```

Iterate through temp and print all the items in temp

In [96]:

```
#code here
```

```
17
Virat
50.0
```

replace first element with 11 in temp

In [98]:

```
#code here
```

Set temp1 = tuple(temp)

In [101]:

```
#code here
```

Iterate through temp1 and print all the items in temp1.

In [163]:

```
#code here
```

```
11
Virat
50.0
```

replace first element with 17 in temp1

In [107]:

```
#code here
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-107-0207b6185b0a> in <module>
----> 1 temp1[0] = 17

TypeError: 'tuple' object does not support item assignment
```

Oops!! You got an error. Hey Don't worry! Its because Once a tuple is created, you cannot change its values unlike list.

3.2 . Create city = ("Bangalore", 28.9949521, 72)

6 points

In [108]:

```
#code here
```

Print first element of city

In [109]:

```
#code here
```

```
Bangalore
```

Create city2 = ('Chennai', 30.01, 74)

In [111]:

```
#code here
```

Create cities which consist of city and city2

In [114]:

```
#code here
```

Print cities

In [115]:

```
#code here
```

Out[115]:

```
(('Bangalore', 28.9949521, 72), ('Chennai', 30.01, 74))
```

Print type of first element in cities

In [164]:

```
#code here
```

```
<class 'tuple'>
```

print the type of cities

In [150]:

```
#code here
```

```
<class 'tuple'>
```

Hey that implies you made a nested tuples!!

4. DICT

Reference:-https://www.youtube.com/watch?v=XCcpzWs-CI4 (https://www.youtube.com/watch?v=XCcpzWs-CI4)

11 points

4.1 Create a dictionary d = {"actor":"amir","animal":"cat","earth":2,"list":[23,32,12]}

In [122]:

```
#code here
```

Print the value of d[0]

In [123]:

```
#code here
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
<ipython-input-123-123a9cc6df61> in <module>
----> 1 d[0]

KeyError: 0
```

Oops!! again an error. again a fun fact. Dictionary return the value for key if key is in the dictionary, else throws KeyError and we don't have key 0 here :(

Store the value of d[‘actor’] to a new variable actor.

In [124]:

```
#code here
```

Print the type of actor

In [126]:

```
#code here
```

```
<class 'str'>
```

Store the value of d['list'] in new variable l.

In [127]:

```
#code here
```

Print the type of l.

In [128]:

```
#code here
```

```
<class 'list'>
```

Create d1 = { 'singer' : 'Kr$na' , 'album': 'Still here', 'genre' : 'hip-hop'}

In [129]:

```
#code here
```

Merge d1 into d.

In [132]:

```
#code here
```

print d

In [134]:

```
#code here


```

Out[134]:

```
{'actor': 'amir',
 'animal': 'cat',
 'earth': 2,
 'list': [23, 32, 12],
 'singer': 'Kr$na',
 'album': 'Still here',
 'genre': 'hip-hop'}
```

Print all the keys in d

In [137]:

```
#code here


```

Out[137]:

```
dict_keys(['actor', 'animal', 'earth', 'list', 'singer', 'album', 'genre'])
```

Print all the values in d

In [138]:

```
#code here


```

Out[138]:

```
dict_values(['amir', 'cat', 2, [23, 32, 12], 'Kr$na', 'Still here', 'hip-ho
p'])
```

Iterate over d, and print each key, value pair as given in output

In [144]:

```
#code here


```

```
actor ----> amir
animal ----> cat
earth ----> 2
list ----> [23, 32, 12]
singer ----> Kr$na
album ----> Still here
genre ----> hip-hop
```

Create a string, sent = ‘Coronavirus Caused Lockdowns Around The World.”

Count the number of occurences of charachters in string named "sent" using dictionary and print the same.

In [2]:

```
#code here
```

Out[2]:

```
{'C': 2,
 'o': 6,
 'r': 4,
 'n': 3,
 'a': 2,
 'v': 1,
 'i': 1,
 'u': 3,
 's': 3,
 ' ': 5,
 'e': 2,
 'd': 4,
 'L': 1,
 'c': 1,
 'k': 1,
 'w': 1,
 'A': 1,
 'T': 1,
 'h': 1,
 'W': 1,
 'l': 1,
 '.': 1}
```

Hurray!! Second milestone completed. The next challenge is waiting for you :)

FeedBack

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