In-class Lab (Day 2)

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Let's begin with some hands-on practice exercises

1. String Operations

11. Create a string with the name 'country' and 'India' as its element. Perform the following on it:
1. **Find its length.**
2. **Extract it first two letters.**

In [42]:
```
# type your code here
country = 'india'
##PRINTS THE LENGTH OF THE STRING
print(len(country))
##PRINTS THE 1ST 2 LETTERS IN THE STRING
print(country[:2])
```

```
5
in
```

2. Given the string 'Today is a sunny day.'
1. **Write a code to get 'Today' and 'sunny'.**
2. **Obtain the last two letters.**
3. **Write the statement backwards.**

In [19]:
```
# type your code here
str1 = "Today is a sunny day"
#gets today from the string
print(str1[0:5])
#gets sunny from the string
print(str1[11:17])
#gets last 2 characters from the string
print(str1[18::])
##reverses the given string
print(str1[::-1])
```

```
Today
sunny
ay
yad ynnus a si yadoT
```

2. List

3. Write a program to perform following list operations on the list given below:

a. Check the length of mix_list_1
b. Check the membership of '24' in mix_list_1
c. Concatenate the mix_list_1 and mix_list_2
d. Repeat the mix_list_2 three times

Lists to perform operations:

mix_list_1 = ['Learn', 24, 'Blue', False, -8]

mix_list_2 = [4, 7, 'Summer']

a. Check the length of mix_list_1

In [24]:
```
# type your code here
mix_list_1 = ['Learn', 24, 'Blue', False, -8]
mix_list_2 = [4, 7, 'Summer']
print(len(mix_list_1))
```

```
5
```

b. Check the membership of '24' in mix_list_1

In [23]:
```
# type your code here
24 in mix_list_1
```

Out[23]:
```
True
```

c. Concatenate the mix_list_1 and mix_list_2

In [25]:
```
# type your code here
mix_list = mix_list_1 + mix_list_2
print(mix_list)
```

```
['Learn', 24, 'Blue', False, -8, 4, 7, 'Summer']
```

d. Repeat the mix_list_2 three times

In [26]:
```
# type your code here
print(mix_list_2 * 3)
```

```
[4, 7, 'Summer', 4, 7, 'Summer', 4, 7, 'Summer']
```

4. Write the program to multiply the two lists

Lists to perform multiplication:

num_list_1 = [1, 2, 3, 4]

num_list_2 = [0, 5, 2, 1]

In [43]:
```
# type your code here
num_list_1 = [1, 2, 3, 4]
num_list_2 = [0, 5, 2, 1]
print(num_list_1 * num_list_2)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-43-7868eaf91be6> in <module>
      2 num_list_1 = [1, 2, 3, 4]
      3 num_list_2 = [0, 5, 2, 1]
----> 4 print(num_list_1 * num_list_2)

TypeError: can't multiply sequence by non-int of type 'list'
```

5. Write a code to retrieve elements from a list

a. First element
b. Second last element
c. First three elements
d. Slice the list from 1st index till the last index with an increment of an index by 2

Use the below list

mix_list = ['Python', 1, 2, 3, 'Data', True]

a. First element

In [28]:
```
# type your code here
mix_list = ['Python', 1, 2, 3, 'Data', True]
print(mix_list[0])
```

```
Python
```

b. Second last element

In [29]:
```
# type your code here
print(mix_list[-2])
```

```
Data
```

c. First three elements

In [31]:
```
# type your code here
print(mix_list[0:3])
```

```
['Python', 1, 2]
```

d. Slice the list from 1st index till the last index with an increment of an index by 2

In [32]:
```
# type your code here
print(mix_list[::2])
```

```
['Python', 2, 'Data']
```

6. Write a program to perform following built-in list operations:

a. Min(list)
b. Max(list)
c. Sort the elements (use sort() and sorted() function)
d. Create a copy of a list
e. Remove element '5' from the list

Use the below list

num_list = [4, 5, 7, -2, 0, 1]

a. Min(list)

In [33]:
```
# type your code here
num_list = [4, 5, 7, -2, 0, 1]
print(min(num_list))
```

```
-2
```

b. Max(list)

In [34]:
```
# type your code here
print(max(num_list))
```

```
7
```

c. Sort the elements (use sort() and sorted() function)

In [37]:
```
# type your code here
num_list.sort()
print(num_list)
```

```
[-2, 0, 1, 4, 5, 7]
```

d. Create a copy of a list

In [39]:
```
# type your code here
num_list_copy = num_list.copy()
print(num_list_copy)
```

```
[-2, 0, 1, 4, 5, 7]
```

e. Remove element '5' from the list

In [41]:
```
# type your code here
num_list.remove(5)
print(num_list)
```

```
[-2, 0, 1, 4, 7]
```

7. Manipulating a list:

a. Add a new element 'Data' in the given list
b. Add elements 'Excel' and 'Data' in the given list
c. Replace an element 'C' with 'C++' in the given list

Use the below list

languages_list = ['R', 'Python', 'C', 'Java']

a. Add a new element 'Data' in the given list

In [3]:
```
# type your code here
languages_list = ['R', 'Python', 'C', 'Java']
languages_list.append('Data')
print(languages_list)
```

```
['R', 'Python', 'C', 'Java', 'Data']
```

b. Add elements 'Excel' and 'Data' in the given list

In [5]:
```
# type your code here
languages_list.append('Excel')
languages_list.append('Data')
print(languages_list)
```

```
['R', 'Python', 'C', 'Java', 'Data', 'Excel', 'Excel', 'Data']
```

c. Replace an element 'C' with 'C++' in the given list

In [2]:
```
# type your code here
languages_list = ['R', 'Python', 'C', 'Java']
languages_list.remove('C')
print(languages_list)
languages_list.append('C++')
print(languages_list)
```

```
['R', 'Python', 'Java']
['R', 'Python', 'Java', 'C++']
```

8. How many times 'Summer' is occuring in a given list?

Use the below list

seasons_list = ['Summer', 'Winter', 'Spring', 'Winter', 'Spring' ,'Summer', 'Spring', 'Summer', 'Winter', 'Summer', 'Spring']

In [4]:
```
# type your code here
seasons_list = ['Summer', 'Winter', 'Spring', 'Winter', 'Spring' ,'Summer', 'S
pring', 'Summer', 'Winter', 'Summer', 'Spring']
count = 0
for i in seasons_list:
    if(i=='Summer'):
        count+=1
print("Summer occurs: ",count)
```

```
Summer occurs:  4
```

3. Tuple

9. Write a code to perform operations on tuple:

a. Check the length of num_tuple
b. Concatenate the num_tuple and mix_tuple
c. Repeat the mix_tuple two times

Tuples to perform operations:

num_tuple = (4, 4, 8)

mix_tuple = 'John', 5, -2

a. Check the length of num_tuple

In [25]:
```
# type your code here

num_tuple = (4, 4, 8)

mix_tuple = ('John', 5, -2)
len(num_tuple)
```

Out[25]: 3

b. Concatenate the num_tuple and mix_tuple

In [26]:
```
# type your code here
num_tuple + mix_tuple
```

Out[26]: (4, 4, 8, 'John', 5, -2)

c. Repeat the mix_tuple two times

In [27]:
```
# type your code here
mix_tuple * 2
```

Out[27]:
```
('John', 5, -2, 'John', 5, -2)
```

10. Add a new element '4' to the given tuple

Use the tuple below:

mix_tuple = (['a', 1, True], 2, 'Science', -5)

In [28]:
```
# type your code here
mix_tuple = (['a', 1, True], 2, 'Science', -5)
mix_tuple.append(4)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-28-3bb901c6aa73> in <module>
      1 # type your code here
      2 mix_tuple = (['a', 1, True], 2, 'Science', -5)
----> 3 mix_tuple.append(4)

AttributeError: 'tuple' object has no attribute 'append'
```

11. Replace the elements in the given tuple:

a. Replace '2' with '3'
b. Replace 'True' in first element with 'False'

Use the tuple below:

mix_tuple = (['a', 1, True], 2, 'Science', -5)

a. Replace '2' with '3'

In [30]:
```
# type your code here
mix_tuple = (['a', 1, True], 2, 'Science', -5)
x = list(mix_tuple)
mix_tuple[1]=3
print(x)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-30-2e907034accf> in <module>
      2 mix_tuple = (['a', 1, True], 2, 'Science', -5)
      3 x = list(mix_tuple)
----> 4 mix_tuple[1]=3
      5 print(x)

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

b. Replace 'True' in first element of the tuple with 'False'

In [31]:
```
# type your code here
mix_tuple[0][2]=False
x
```

Out[31]:
```
[['a', 1, False], 2, 'Science', -5]
```

4. Set

12. Write the program to perform following manipulations:

a. Add '7' to the given set
b. Remove '3' from a given set
c. Clear the set

Use the below set for manipulation

num_set = {1, 2, 3, 4, 5, 6}

a. Add '7' to the given set

In [11]:
```
# type your code here
num_set = {1, 2, 3, 4, 5, 6}
num_set.add(7)
print(num_set)
```

```
{1, 2, 3, 4, 5, 6, 7}
```

b. Remove '3' from a given set

In [12]:
```
# type your code here
num_set.remove(3)
print(num_set)
```

```
{1, 2, 4, 5, 6, 7}
```

c. Clear the set

In [13]:
```
# type your code here
num_set.clear()
print(num_set)
```

```
set()
```

13. Create two sets of words from the given sentences and perform the following operations:

a. Find the count of unique words in each of the sentence
b. Find the common words in both the sentences
c. Find the unique words in both the sentences

Use the sentences given below:

sentence_1 = 'We shall analyse the data using python'

sentence_2 = 'Python for data science'

Create set of words

In [16]:
```
# type your code here
sentence_1 = 'We shall analyse the data using python'
s1=set(sentence_1.split(" "))
len(s1)
sentence_2 = 'Python for data science'
s2=set(sentence_2.split(" "))
len(s2)
print(len(s1))
print(len(s2))
```

```
7
4
```

a. Find the number of unique words in the sentences

In [17]:
```
# type your code here
print(len(s1))
print(len(s2))
```

```
7
4
```

b. Find the common words in both the sentences

In [18]:
```
# type your code here
s1&s2
```

Out[18]:
```
{'data'}
```

c. Find the unique words in both the sentences

In [19]:
```
# type your code here
s1^s2
```

Out[19]:
```
{'Python',
 'We',
 'analyse',
 'for',
 'python',
 'science',
 'shall',
 'the',
 'using'}
```

14. Write a program to perform following set operations:

a. Union
b. Intersection
c. Set of all the elements of set A that are not in set B
d. Set of all the elements of set B that are not in set A
e. Symmetric difference

Use the below set:

A = {1, 4, 5, 2, 6, 3, 40, 7, 87, 4, 71}

B = {3, 42, 51, 6, 7, 8, 54, 5}

a. Union

In [20]:
```
# type your code here
A = {1, 4, 5, 2, 6, 3, 40, 7, 87, 4, 71}

B = {3, 42, 51, 6, 7, 8, 54, 5}

A.union(B)
```

Out[20]: {1, 2, 3, 4, 5, 6, 7, 8, 40, 42, 51, 54, 71, 87}

b. Intersection

In [21]:
```
# type your code here
A&B
```

Out[21]: {3, 5, 6, 7}

c. Set of all the elements of set A that are not in set B

In [22]:
```
# type your code here
A-B
```

Out[22]: {1, 2, 4, 40, 71, 87}

d. Set of all the elements of set B that are not in set A

In [23]:
```
# type your code here
B-A
```

Out[23]: {8, 42, 51, 54}

e. Symmetric difference

In [24]:
```
# type your code here
A^B
```

Out[24]: {1, 2, 4, 8, 40, 42, 51, 54, 71, 87}

5. Dictionary

15. Write a code to add a key to a dictionary

Use the given dictionary and add a key (4:16)

square_dictionary = {1:1, 2:4, 3:9}

In [6]:
```
# type your code here
square_dictionary = {1:1, 2:4, 3:9}
square_dictionary[4]=16
print(square_dictionary)
```

```
{1: 1, 2: 4, 3: 9, 4: 16}
```

16. Write a program to retrieve the keys/values of dictionary

Use the dictionary

mix_dictionary = {0:3, 'x':5, 1:2}

In [7]:
```
# type your code here
mix_dictionary = {0:3, 'x':5, 1:2}
print(mix_dictionary.keys())
print(mix_dictionary.values())
```

```
dict_keys([0, 'x', 1])
dict_values([3, 5, 2])
```

17. Write a program to get the value for 'Age' from the dictionary

Use the dictionary

emp_record = {'Weight': 67, 'BMI': 25, 'Age': 27, 'Profession': 'CA'}

In [8]:
```
# type your code here
emp_record = {'Weight': 67, 'BMI': 25, 'Age': 27, 'Profession': 'CA'}
emp_record['Age']
```

Out[8]:
```
27
```

18. Write a program to create a dictionary using given keys and values

Use the keys and values to create a dictionary

key = ['a','b','c','d']

value = [1, 2, 3, 4]

In [9]:
```
# type your code here
key = ['a','b','c','d']

value = [1, 2, 3, 4]

dict(zip(key,value))
```

Out[9]:
```
{'a': 1, 'b': 2, 'c': 3, 'd': 4}
```

19. Set the country of an employee as 'India' in the given employee record

Use the dictionary

emp_record = {'Emp_ID': 'ES001', 'Weight': 67, 'BMI': 25, 'Age': 27, 'Profession': 'CA'}

In [10]:
```
# type your code here
emp_record = {'Emp_ID': 'ES001', 'Weight': 67, 'BMI': 25, 'Age': 27, 'Professi
on': 'CA'}
emp_record['Country'] = 'India'
print(emp_record)
```

```
{'Emp_ID': 'ES001', 'Weight': 67, 'BMI': 25, 'Age': 27, 'Profession': 'CA',
'Country': 'India'}
```

In [ ]:
```

```