List Structure :-

The list can be defined as an abstract data type in which the elements are stored in an ordered manner for easier and efficient retrieval of the elements. List Data Structure allows repetition that means a single piece of data can occur more than once in a list. In the case of multiple entries of the same data, each entry of that repeating data is considered as a distinct item or entry. It is very much similar to the array but the major difference between the array and the list data structure is that array stores only homogenous data in them whereas the list (in some programming languages) can store heterogeneous data items in its object. List Data Structure is also known as a sequence.

Creating empty list :-

In [18]:
```
myList = []
```

Creating Nested list :-

In [2]:
```
mylist1 = ['salt','sugar','coffe','toast','biscuit','chips','soap','tea',[10,20,30,40
```

In [3]:
```
mylist1
```

Out[3]:
```
['salt',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4]]
```

Example 2:-

In [21]:
```
firstGen = ['grandfather', 'grandmother']
secondGen = ['father', 'mother']
thirdGen = ['son', 'daughter']
fourthGen = ['grandson', 'granddaughter']
```

In [22]:
```
family_list = []
```

In [23]:
```
thirdGen .insert(1,fourthGen)
```

In [24]:
```
print(thirdGen)
```

```
['son', ['grandson', 'granddaughter'], 'daughter']
```

In [25]:
```
secondGen .insert(2,thirdGen)
```

In [26]:
```
print (secondGen)
```

```
['father', 'mother', ['son', ['grandson', 'granddaughter'], 'daughter']]
```

In [27]:
```
firstGen .insert(2,secondGen)
```

In [28]:
```
print (firstGen)
```

```
['grandfather', 'grandmother', ['father', 'mother', ['son', ['grandson', 'granddaught
er'], 'daughter']]]
```

List of mixed data :-

In [29]:
```
mylist2 = ['Sugar',3456,23.87]# list of mixed data type
```

calculate the length of list

In [30]:
```
len (mylist1)# This function tells the length of list
```

Out[30]:
```
10
```

List Indexing

In [31]:
```
mylist1[2]
```

Out[31]:
```
'coffe'
```

In [32]:
```
mylist1[8][3]
```

Out[32]:
```
40
```

In [33]:
```
mylist1[-1][-1]
```

Out[33]:
```
32.4
```

List Slicing

In [34]:
```
mylist1[0:4]
```

Out[34]:
```
['salt', 'sugar', 'coffe', 'toast']
```

In [35]:
```
mylist1[2:5]
```

Out[35]:
```
['coffe', 'toast', 'biscuit']
```

In [36]:
```
mylist1[:8]
```

Out[36]:
```
['salt', 'sugar', 'coffe', 'toast', 'biscuit', 'chips', 'soap', 'tea']
```

In [37]:
```
mylist1[-8:]
```

Out[37]:
```
['coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4]]
```

ADD

APPEND : It will add the data in the last.

INSERT : It add the data at specific position.

In [5]:
```
#1.Append
mylist1.append('apple')
```

In [41]:
```
#2. INSERT
mylist1.insert(1,'milk')
```

In [42]:
```
mylist1
```

Out[42]:
```
['salt',
 'milk',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4],
 'apple']
```

Remove:-

In [43]:
```
mylist1.remove('salt')# It remove any item from list
```

In [44]:
```
mylist1
```

Out[44]:
```
['milk',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4],
 'apple']
```

In [45]:
```
mylist1.pop()# It delete the last item from the list
```

Out[45]:
```
'apple'
```

In [46]:
```
mylist1
```

Out[46]:
```
['milk',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4]]
```

In [54]:
```
del mylist1 [2]# It delete the whole list
```

In [6]:
```
mylist1
```

Out[6]:
```
['salt',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4],
 'apple']
```

In [7]:
```
# Change Items
mylist1[0]="Pink Salt"
```

In [8]:
```
mylist1
```

Out[8]:
```
['Pink Salt',
 'sugar',
 'coffe',
 'toast',
 'biscuit',
 'chips',
 'soap',
 'tea',
 [10, 20, 30, 40, 29, 32, 49, 34, 39, 10],
 [12.3, 34.44, 34.5, 67.34, 9.4, 39.4, 32.54, 32.4],
 'apple']
```

In [10]:
```
# Clear function empty the list
mylist1.clear()
```

In [11]:
```
mylist1
```

Out[11]:
```
[]
```

In [14]:
```
del mylist1 # it delete the whole list
mylist1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_2288\1440444907.py in <module>
----> 1 del mylist1 # it delete the whole list

NameError: name 'mylist1' is not defined
```

In [ ]: