Topics

- Data Structures It is a collection of different data types
    - List
    - tuple
    - set
    - Dictionary

List

[]

- All list are muttuable or changeble

```
In [1]:    1  l = [1,2,3,"a","b"]
           2  type(l)
```

```
Out[1]:  list
```

```
In [3]:    1  l1 = ["1",2,3,4]
           2  l2 = ["a","b","c"]
           3  l1+l2
```

```
Out[3]:  ['1', 2, 3, 4, 'a', 'b', 'c']
```

```
In [4]:    1  l = [1,2,3,["a","b","c"]]
```

```
In [18]:   1  lc=l.copy()
```

```
In [19]:   1  len(l)
```

```
Out[19]:  6
```

Accessing

based on indexing

```
In [20]:   1  print(l)
```

```
[1, 2, 3, ['a', 'b', 'c'], 'APSSDC', ['Python', 'Program']]
```

```
In [21]:   1  l[0]
           2  l[3]
```

```
Out[21]:  ['a', 'b', 'c']
```

```
In [22]:    1  l[3][1:3]
```

Out[22]: ['b', 'c']

```
In [23]:    1  print(dir(list))
```

['__add__', '__class__', '__contains__', '__delattr__', '__delitem__', '__dir_
_', '__doc__', '__eq__', '__format__', '__ge__', '__getattribute__', '__getitem
__', '__gt__', '__hash__', '__iadd__', '__imul__', '__init__', '__init_subclass
__', '__iter__', '__le__', '__len__', '__lt__', '__mul__', '__ne__', '__new__',
'__reduce__', '__reduce_ex__', '__repr__', '__reversed__', '__rmul__', '__setat
tr__', '__setitem__', '__sizeof__', '__str__', '__subclasshook__', 'append', 'c
lear', 'copy', 'count', 'extend', 'index', 'insert', 'pop', 'remove', 'revers
e', 'sort']

```
In [24]:    1  ## append is used to add elements to list
            2
            3  print(l)
```

[1, 2, 3, ['a', 'b', 'c'], 'APSSDC', ['Python', 'Program']]

```
In [28]:    1  l.append("APSSDC")
```

```
In [36]:    1  print(l.append(["Python","Program"]))
```

None

```
In [30]:    1  l
```

Out[30]: [1,
 2,
 3,
 ['a', 'b', 'c'],
 'APSSDC',
 ['Python', 'Program'],
 'APSSDC',
 ['Python', 'Program'],
 'APSSDC',
 ['Python', 'Program']]

```
In [32]:    1  l.count(['Python', 'Program'])
```

Out[32]: 3

```
In [33]:    1  print(l1)
            2  print(l2)
```

['1', 2, 3, 4]
['a', 'b', 'c']

```
In [34]:  1  print(l1+l2)
          2  print(l1)
          3  print(l2)
          4  print(l1.extend(l2))   # to add two list
```

```
['1', 2, 3, 4, 'a', 'b', 'c']
['1', 2, 3, 4]
['a', 'b', 'c']
None
```

```
In [35]:  1  l1
```

Out[35]: ['1', 2, 3, 4, 'a', 'b', 'c']

```
In [37]:  1  l1.index(3)
```

Out[37]: 2

```
In [38]:  1  l1.insert(3,"Python")
```

```
In [39]:  1  l1
```

Out[39]: ['1', 2, 3, 'Python', 4, 'a', 'b', 'c']

```
In [49]:  1  # Pop will delete element defaultly the last position
          2
          3  l1.pop()
```

Out[49]: 'b'

```
In [56]:  1  l1.pop(1)
```

Out[56]: 2

```
In [58]:  1  l1.remove(4)
```

```
In [59]:  1  l1
```

Out[59]: ['1']

```
In [60]:  1  l1 = [1,2,3,4,"a","b","c"]
          2  l1.pop()
```

Out[60]: 'c'

```
In [62]:  1  l1.pop(3)   # index position
```

Out[62]: 4
```

```
In [63]:    1  l1
```

Out[63]: [1, 2, 3, 'a', 'b']

```
In [64]:    1  l1.remove("a")
```

```
In [65]:    1  l1
```

Out[65]: [1, 2, 3, 'b']

```
In [66]:    1  l1.sort()
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-66-b8f5f256bbcf> in <module>
----> 1 l1.sort()

TypeError: '<' not supported between instances of 'str' and 'int'
```

```
In [67]:    1  l2 = ["APSSDC","Python","Cat"]
            2  l2.sort()
```

```
In [68]:    1  l2
```

Out[68]: ['APSSDC', 'Cat', 'Python']

```
In [70]:    1  l2.reverse()
```

```
In [71]:    1  l2
```

Out[71]: ['Python', 'Cat', 'APSSDC']

```
In [72]:    1  l = [1,2,5,2,3,10]
            2  l.reverse()
            3  l
```

Out[72]: [10, 3, 2, 5, 2, 1]

```
In [73]:    1  l.sort()
```

```
In [77]:    1  l.reverse()
            2  l
```

Out[77]: [10, 5, 3, 2, 2, 1]
```

```
In [78]:   1  l = [1,2,5,2,3,10]
           2  l.sort(reverse = True)
```

```
In [79]:   1  l
```

Out[79]: [10, 5, 3, 2, 2, 1]

```
In [80]:   1  l.clear()
           2  l
```

Out[80]: []

```
In [82]:   1  del l
```

. . .

```
In [84]:   1  del l1
```

```
In [85]:   1  l1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-85-6cf485bc2797> in <module>
----> 1 l1

NameError: name 'l1' is not defined
```

Tasks

1. l = [34,24,"Apple",17,56,22,"mango","cherry","banana"]
   output: [17,22,24,34,56,"Apple","banana","cherry","mango"]
2. l = [1,2,4,2,3,"a","b","a","b"]
   output:[1,2,4,3,"a","b"]

```
In [102]:   1  l = [34,24,"Apple",17,56,22,"mango","cherry","banana"]
            2  l1 = []
            3  l2 = []
            4  for i in l:
            5      if str(i).isdigit():  # str(34)==>"34"
            6          l1.append(i)
            7      else:
            8          l2.append(i)
            9  l1.sort()
           10  l2.sort()
           11  l1.extend(l2)
           12  l1
```

Out[102]: [17, 22, 24, 34, 56, 'Apple', 'banana', 'cherry', 'mango']

In [91]:
```
1 l =  [1,2,4,2,3,"a","b","a","b"]
2 l1 = []  #[1,2,4,3]
3 for i in l:  # 1,2
4     if i not in l1:
5         l1.append(i)
6 print(l1)
```

[1, 2, 4, 3, 'a', 'b']

Tuple

Immutable ===>()

In [92]:
```
1 t = (1,2,3)
2 t[0]
```

Out[92]: 1

In [93]:
```
1 t1 = (1,2,3)
2 t2=("a","b")
3 t1+t2
```

Out[93]: (1, 2, 3, 'a', 'b')

In [95]:
```
1 print(dir(tuple))
```

```
['__add__', '__class__', '__contains__', '__delattr__', '__dir__', '__doc__',
'__eq__', '__format__', '__ge__', '__getattribute__', '__getitem__', '__getnewa
rgs__', '__gt__', '__hash__', '__init__', '__init_subclass__', '__iter__', '__l
e__', '__len__', '__lt__', '__mul__', '__ne__', '__new__', '__reduce__', '__red
uce_ex__', '__repr__', '__rmul__', '__setattr__', '__sizeof__', '__str__', '__s
ubclasshook__', 'count', 'index']
```

In [98]:
```
1 t1.index(2)
2 len(t1)
```

Out[98]: 3

In [99]:
```
1 t1.count(3)
```

Out[99]: 1

In [100]:
```
1 del t1
```

```
In [101]:  1  t1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-101-5db19043943a> in <module>
----> 1 t1

NameError: name 't1' is not defined
```

```
In [103]:  1  l = [2,3,5,3,"a","b","c","a","b","a",3,2]
           2  remove all a's and 3 from the list
           3  [2,5,"b","c"]
```

```
  File "<ipython-input-103-6c606ddf4e41>", line 2
    remove all a's and 3 from the list
              ^
SyntaxError: invalid syntax
```

```
In [13]:  1  l = [2,3,5,3,3,3,2,"a","b","c","a","b","a"]
          2  for i in range(len(l)+1):
          3      if l[i] ==3 or l[i] == "a":
          4
          5          l.remove(l[i])
          6  print(l)
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
<ipython-input-13-938b14b99243> in <module>
      1 l = [2,3,5,3,3,3,2,"a","b","c","a","b","a"]
      2 for i in range(len(l)+1):
----> 3     if l[i] ==3 or l[i] == "a":
      4
      5          l.remove(l[i])

IndexError: list index out of range
```

```
In [17]:  1  l = [2,3,5,3,3,2,"a","b","c","a","b","a"]
          2  while 3 in l:
          3      l.remove(3)
          4  print(l)
```

```
[2, 5, 2, 'a', 'b', 'c', 'a', 'b', 'a']
```

```
In [ ]:  1
```