What is data structure?

- data structures are used to store the collection of related data.
- we have 4 built in data structures in python- list,tuple,dictionary and set.

list

- it is a collection of different data types.
- it is mutable(changeable).
- allow duplicate members.
- in python lists are written with square brackets.

In [1]:

```
lst = ['spmvv',12,23,30.8,'apssdc',20]
print(lst)
```

```
['spmvv', 12, 23, 30.8, 'apssdc', 20]
```

In [2]:

```
# indexing/slicing
lst[0]
```

Out[2]:

```
'spmvv'
```

In [3]:

```
lst[0:6]
```

Out[3]:

```
['spmvv', 12, 23, 30.8, 'apssdc', 20]
```

In [4]:

```
lst[0:6:2]
```

Out[4]:

```
['spmvv', 23, 'apssdc']
```

In [6]:

```
lst[2:5:6]
```

Out[6]:

```
[23]
```

In [12]:

```
lst2 = ['cse',5.8,14,18,[13,15.3,'ece'],'mech',9.0]
print(lst2)
```

```
['cse', 5.8, 14, 18, [13, 15.3, 'ece'], 'mech', 9.0]
```

In [17]:

```
# ['ece',15.3,13]
lst2[-3]
```

Out[17]:

```
[13, 15.3, 'ece']
```

In [18]:

```
lst2[-3][-1 :: -1]
```

Out[18]:

```
['ece', 15.3, 13]
```

In [8]:

```
print(len(lst2))
```

```
8
```

In [10]:

```
lst2[5]
```

Out[10]:

```
[13, 15.3, 'ece']
```

In [15]:

```
lst2[5][1]
```

Out[15]:

```
15.3
```

In [18]:

```
print(lst2[5][2])
```

```
ece
```

In [23]:

```
lst = [1,2,[3,4,5,[6,7,8,9],10,'cse'],9.8,13]
print(len(lst))
```

```
5
```

In [25]:

```
1 lst[2]
```

Out[25]:

```
[3, 4, 5, [6, 7, 8, 9], 10, 'cse']
```

In [26]:

```
1 lst[2][3][3]
```

Out[26]:

```
9
```

In [27]:

```
1 lst[2][3]
```

Out[27]:

```
[6, 7, 8, 9]
```

In [28]:

```
1 lst[2][0]
```

Out[28]:

```
3
```

In [2]:

```
1 p=lst.index(2)
2 print(p)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-2-a6500d88576e> in <module>
----> 1 p=lst.index(2)
      2 print(p)

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

In [3]:

```
1 print(dir(list))
```

```
['__add__', '__class__', '__contains__', '__delattr__', '__delitem__', '__di
r__', '__doc__', '__eq__', '__format__', '__ge__', '__getattribute__', '__ge
titem__', '__gt__', '__hash__', '__iadd__', '__imul__', '__init__', '__init_
subclass__', '__iter__', '__le__', '__len__', '__lt__', '__mul__', '__ne__',
'__new__', '__reduce__', '__reduce_ex__', '__repr__', '__reversed__', '__rmu
l__', '__setattr__', '__setitem__', '__sizeof__', '__str__', '__subclasshook
__', 'append', 'clear', 'copy', 'count', 'extend', 'index', 'insert', 'pop',
'remove', 'reverse', 'sort']
```

In [5]:

```
## list is mutable
lst = [2,7,'cse',9.0,'civil',8.5,13,17]
lst[3] ='harsha'
```

In [6]:

```
print(lst)
```

```
[2, 7, 'cse', 'harsha', 'civil', 8.5, 13, 17]
```

In [7]:

```
lst.append('ece')
print(lst)
```

```
[2, 7, 'cse', 'harsha', 'civil', 8.5, 13, 17, 'ece']
```

In [8]:

```
lst = ['spmvv',12,23,30.8,'apssdc',20]
lst[-1:-7:-1]
```

Out[8]:

```
[20, 'apssdc', 30.8, 23, 12, 'spmvv']
```

In [10]:

```
lst[-1::-1]
```

Out[10]:

```
[20, 'apssdc', 30.8, 23, 12, 'spmvv']
```

In [11]:

```
lst[-3:-6:-1]
```

Out[11]:

```
[30.8, 23, 12]
```

In [4]:

```
# copy() method
lst2 = lst4.copy()
print("List2 = ",lst2)
print("List1 =",lst4)


```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-4-22aef8f32de5> in <module>
      1 # copy() method
----> 2 lst2 = lst4.copy()
      3 print("List2 = ",lst2)
      4 print("List1 =",lst4)
      5

NameError: name 'lst4' is not defined
```

In [6]:

```
# extend()
lst.extend(['a','b'])
print(lst)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-6-0abcab9f36bb> in <module>
      1 # extend()
----> 2 lst.extend(['a','b'])
      3 print(lst)

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

In [7]:

```
lst = [90,89,'cse','harsha']
print(lst)
```

```
[90, 89, 'cse', 'harsha']
```

In [8]:

```
lst.append('cse')
print(lst)
```

```
[90, 89, 'cse', 'harsha', 'cse']
```

In [9]:

```
lst.count('cse')
```

Out[9]:

```
2
```

In [10]:

```
lst.count(89)
```

Out[10]:

```
1
```

In [11]:

```
lst.count('priya')
```

Out[11]:

```
0
```

In [12]:

```
#extend
lst.extend(['a','b'])
print(lst)
```

```
[90, 89, 'cse', 'harsha', 'cse', 'a', 'b']
```

In [15]:

```
lst.append([1,2,3])
print(lst)
```

```
[90, 89, 'cse', 'harsha', 'cse', 'a', 'b', [1, 2, 3], [1, 2, 3], [1, 2, 3]]
```

In [16]:

```
lst.index('harsha')
```

Out[16]:

```
3
```

In [17]:

```
for i in range(len(lst)):
    print(i,"=",lst[i])
```

```
0 = 90
1 = 89
2 = cse
3 = harsha
4 = cse
5 = a
6 = b
7 = [1, 2, 3]
8 = [1, 2, 3]
9 = [1, 2, 3]
```

In [18]:

```
for i in range(len(lst)): #i=0, i=1, i=2
    if(lst[i] == 'cse'): # 2 == 'cse', 7 == 'cse', 'cse' == 'cse'
        print(i)
```

```
2
4
```

In [ ]:

```

```