TUPLES:

```
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          - sorted

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```

Representation:

```
In [ ]:   **initialization:
```

```
In [1]:   t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          t1
```

Out[1]:   (1, 3, 'shruthi', 'vasanth', (9+10j), 9.0, -3, True, False)

```
In [5]:   t2=(9,3,5,10,-3,0,2)
          t2
```

Out[5]:   (9, 3, 5, 10, -3, 0, 2)

```
In [7]:   t2=(9,3,5,(10,-3,0,2))
          print(t2)
```

```
          (9, 3, 5, (10, -3, 0, 2))
```

Type

```
In [9]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
        type(t1)
```

Out[9]: tuple

len

```
In [10]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
         len(t1)
```

Out[10]: 9

```
In [16]: t1='mississippi'
         len(t1)
```

Out[16]: 11

max

```
In [17]: t3=(7,0,10,-3,66,1,29,-123,5,2)
         max(t3)
```

Out[17]: 66

min

```
In [18]: t3=(7,0,10,-3,66,1,29,-123,5,2)
         min(t3)
```

Out[18]: -123

sum

```
In [19]: t3=(7,0,10,-3,66,1,29,-123,5,2)
         sum(t3)
```

Out[19]: -6

sorted

```
In [20]: t3=(7,0,10,-3,66,1,29,-123,5,2)
         sorted(t3)
```

Out[20]: [-123, -3, 0, 1, 2, 5, 7, 10, 29, 66]

```
In [23]: t3=(7,0,10,-3,66,1,29,-123,5,2)
         sorted(t3,reverse=True)
```

Out[23]: [66, 29, 10, 7, 5, 2, 1, 0, -3, -123]

reversed

```
In [25]:  t3=(7,0,10,-3,66,1,29,-123,5,2)
          t4=reversed(t3)
          for i in t4:
              print(i)

2
5
-123
29
1
66
-3
10
0
7
```

```
In [27]:  t=('shruthi')
          sorted(t)
```

Out[27]: ['h', 'h', 'i', 'r', 's', 't', 'u']

```
In [30]:  t=('shruthi')
          sorted(t,reverse=True)
```

Out[30]: ['u', 't', 's', 'r', 'i', 'h', 'h']

in

```
In [32]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          'vasanth' in t1
```

Out[32]: True

```
In [34]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          False not in t1
```

Out[34]: False

```
In [35]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          9+10j in t1
```

Out[35]: True

for loop with in

```
In [36]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          for i in t1:
              print(i)
```

```
1
3
shruthi
vasanth
(9+10j)
9.0
-3
True
False
```

index

```
In [42]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          print(t1[-1])
          print(t1[5])
          print(t1[4])
          print(t1[-9])
```

```
False
9.0
(9+10j)
1
```

for loop with index

```
In [37]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          for i in range(len(t1)):
              print(f"the positive index of {t1[i]} is {i}")
```

```
the positive index of 1 is 0
the positive index of 3 is 1
the positive index of shruthi is 2
the positive index of vasanth is 3
the positive index of (9+10j) is 4
the positive index of 9.0 is 5
the positive index of -3 is 6
the positive index of True is 7
the positive index of False is 8
```

```
In [38]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
          for i in range(len(t1)):
              print(f"the negative index of {t1[i]} is {i-len(t1)}")
```

```
the negative index of 1 is -9
the negative index of 3 is -8
the negative index of shruthi is -7
the negative index of vasanth is -6
the negative index of (9+10j) is -5
the negative index of 9.0 is -4
the negative index of -3 is -3
the negative index of True is -2
the negative index of False is -1
```

mutable and immutable

```
In [45]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
         t1[5]=10000
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[45], line 2
      1 t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
----> 2 t1[5]=10000

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

```
In [46]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
         t1[-2]=89.9
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[46], line 2
      1 t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
----> 2 t1[-2]=89.9

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

```
In [ ]: --tuples are immutable
        --we cannot assign item to tuple
```

slicing

```
In [51]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
         t1[::]
```

```
Out[51]: (1, 3, 'shruthi', 'vasanth', (9+10j), 9.0, -3, True, False)
```

```
In [52]: t1[::-1]
```

```
Out[52]: (False, True, -3, 9.0, (9+10j), 'vasanth', 'shruthi', 3, 1)
```

```
In [53]: t1[::2]
```

```
Out[53]: (1, 'shruthi', (9+10j), -3, False)
```

```
In [54]: t1[-3:2]
```

```
Out[54]: (1, 'shruthi', (9+10j))
```

```
In [55]: t1[-9:-4]
```

```
Out[55]: (False, (9+10j))
```

```
In [56]: t1[-5:3]
```

```
Out[56]: (1, 'vasanth')
```

```
In [57]: t1[8:-9:2]
```

Out[57]: ()

In [58]: `t1[8:-9:-2]`

Out[58]: (False, -3, (9+10j), 'shruthi')

In [65]: `t1[8:1:-5]`

Out[65]: (False, 'vasanth')

concatenation

In [67]:
```
t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False)
t2=(10,3,100,(1,3,5,7,9),())
t1+t2
```

Out[67]: (1,
          3,
          'shruthi',
          'vasanth',
          (9+10j),
          9.0,
          -3,
          True,
          False,
          10,
          3,
          100,
          (1, 3, 5, 7, 9),
          ())

Methods

In [68]: `dir(())`

```
Out[68]: ['__add__',
          '__class__',
          '__class_getitem__',
          '__contains__',
          '__delattr__',
          '__dir__',
          '__doc__',
          '__eq__',
          '__format__',
          '__ge__',
          '__getattribute__',
          '__getitem__',
          '__getnewargs__',
          '__getstate__',
          '__gt__',
          '__hash__',
          '__init__',
          '__init_subclass__',
          '__iter__',
          '__le__',
          '__len__',
          '__lt__',
          '__mul__',
          '__ne__',
          '__new__',
          '__reduce__',
          '__reduce_ex__',
          '__repr__',
          '__rmul__',
          '__setattr__',
          '__sizeof__',
          '__str__',
          '__subclasshook__',
          'count',
          'index']
```

tuple methods

```
In [69]: #count
         #index
```

count

```
In [74]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False,3,5,56,5,3,3,5,8)
         t1.count(5)
```

```
Out[74]: 3
```

index

```
In [82]: t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False,3,5,56,5,3,3,5,8)
         print(t1.index(5))
         print(t1.index(-3))
```

```
10
6
```

```python
In [ ]:  t1=(1,3,'shruthi','vasanth',9+10j,9.0,-3,True,False,3,5,56,3,3,8)
         i1=t1.index(3)
         i1
         i2=t1.index(3,i1+1)
         i2
         i3=t1.index(3,i2+1)
         i3
         i4=t1.index(3,i3+1)
         i4
```