Tuples

1. Initializing tuples
2. Tuple with single item
3. Packing and Unpacking tuples
4. Accessing a Tuple & Slicing a tuple
5. Update a tuple (?)
6. del

```
# initialize a tuple

t = ()
print(t)
print(type(t))
```

```
()
<class 'tuple'>
```

```
t = tuple()
print(t)
print(type(t))
```

```
()
<class 'tuple'>
```

```
t = tuple([])
print(t)
print(type(t))

t = tuple(())
print(t)
print(type(t))

t = tuple("")
print(t)
print(type(t))
```

```
()
<class 'tuple'>
()
<class 'tuple'>
()
<class 'tuple'>
```

```
t = tuple(" ")
print(t)
print(type(t))
```

```
(' ',)
<class 'tuple'>
```

```
t1= (1)
t2 = 1
t3 = 1,
t4 = (1,)

print(t1)
print(t2)
print(t3)
print(t4)

print(type(t1))
print(type(t2))
print(type(t3))
print(type(t4))
```

```
1
1
(1,)
(1,)
<class 'int'>
<class 'int'>
<class 'tuple'>
<class 'tuple'>
```

```
t1 = "a","b","c"
t2 = ("a","b","c")
print(t1)
print(t2)
print(type(t1))
print(type(t2))
```

```
('a', 'b', 'c')
('a', 'b', 'c')
<class 'tuple'>
<class 'tuple'>
```

```
i,j,k = ("a","b","c")
print(i)
print(j)
print(k)
```

```
a
b
c
```

```
a,b = (1,2,3,4,5,6,7)
print(a)
print(b)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-10-6cb46af73850> in <cell line: 1>()
----> 1 a,b = (1,2,3,4,5,6,7)
      2 print(a)
      3 print(b)

ValueError: too many values to unpack (expected 2)
```

Next steps: Explain error

```
# use of * operator

a, *b = (1,2,3,4,5,6,7)

print(a)
print(b)
print(type(a))
print(type(b))
```

```
1
[2, 3, 4, 5, 6, 7]
<class 'int'>
<class 'list'>
```

```
a, *b, c, d = (1,2,3,4,5,6,7)

print(a)
print(b)
print(c)
print(d)
print(type(a))
print(type(b))
print(type(c))
print(type(d))
```

```
1
[2, 3, 4, 5]
6
7
<class 'int'>
<class 'list'>
<class 'int'>
<class 'int'>
```

```
a, *b, c, *d = (1,2,3,4,5,6,7)
print(b)
print(d)
```

```
  File "<ipython-input-13-3c10fa4fa754>", line 1
    a, *b, c, *d = (1,2,3,4,5,6,7)
       ^
SyntaxError: multiple starred expressions in assignment
```

Next steps: Fix error

```
a, *b = (1,2)
c,d = (1,2)
print(a)
print(b)
print(c)
print(d)
print(type(a))
print(type(b))
print(type(c))
print(type(d))
```

```
1
[2]
1
2
<class 'int'>
<class 'list'>
<class 'int'>
<class 'int'>
```

```
a,b,c,d = (1,2)
print(a)
print(b)
print(c)
print(d)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-19-63b74789162d> in <cell line: 1>()
----> 1 a,b,c,d = (1,2)
      2 print(a)
      3 print(b)
      4 print(c)
      5 print(d)

ValueError: not enough values to unpack (expected 4, got 2)
```

Next steps: Explain error

```
a,b = [1,2,3]
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-20-e99d840cfee5> in <cell line: 1>()
----> 1 a,b = [1,2,3]

ValueError: too many values to unpack (expected 2)
```

Next steps: Explain error

```
a, *b = [1,2,3]

print(a)
print(b)
print(type(a))
print(type(b))
```

```
1
[2, 3]
<class 'int'>
<class 'list'>
```

Accessing tuples

```
t = tuple("python")
print(t)
print(type(t))
```

```
('p', 'y', 't', 'h', 'o', 'n')
<class 'tuple'>
```

```
print(t[0])
print(t[-1])
print(t[5])
```

```
p
n
n
```

```
# slice a tuple

print(t[1:4])
print(t[1:])
```

```
('y', 't', 'h')
('y', 't', 'h', 'o', 'n')
```

```
l = list("python")
t = tuple("python")

l[0] = "m"
print(l)
t[0] = "k"
print(t)
```

```
['m', 'y', 't', 'h', 'o', 'n']
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-26-daa25e53e765> in <cell line: 6>()
      4 l[0] = "m"
      5 print(l)
----> 6 t[0] = "k"
      7 print(t)

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

Next steps: Explain error

```
l = [1,2,3,4,5]

t = (1,2,3,l)

print(t)
print(id(t))
```

```
(1, 2, 3, [1, 2, 3, 4, 5])
137998969415024
```

```
print(id(l))
l[0] = 10
print(t)
print(id(l))
print(id(t))
```

```
137998968143616
(1, 2, 3, [10, 2, 3, 4, 5])
137998968143616
137998969415024
```

```
print(t)
```

```
(1, 2, 3, [10, 2, 3, 4, 5])
```

```
# Q1
t[3][0] = 100
print(t)
```

```
(1, 2, 3, [100, 2, 3, 4, 5])
```

```
# Q2

t[3] = [100,2,3,4,5]
print(t)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-31-979025afbed0> in <cell line: 3>()
      1 # Q2
      2
----> 3 t[3] = [100,2,3,4,5]
      4 print(t)

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

Next steps: Explain error

```
l = [1,2,3,4,5]
m = l

print(m)
print(l)
print(id(m))
print(id(l))
```

```
[1, 2, 3, 4, 5]
[1, 2, 3, 4, 5]
137998968567104
137998968567104
```

```
l[0] = 1000

print(m)
print(l)
```

```
[1000, 2, 3, 4, 5]
[1000, 2, 3, 4, 5]
```

```
k = [1,2,3]
o = [1,2,3]

print(id(k))
print(id(o))
```

```
137998968182400
137998967714560
```

```
l = [1,2,3,4,5]

m = l.copy()

print(m)
print(l)
print(id(m))
print(id(l))

l[0] = 1000
print(l)
print(m)
```

```
[1, 2, 3, 4, 5]
[1, 2, 3, 4, 5]
137998967979200
137998967819648
[1000, 2, 3, 4, 5]
[1, 2, 3, 4, 5]
```

```
sub_list = ["a","b","c"]
l = [1,2,3,sub_list]
m = l.copy()
print(l)
print(m)
print(id(l))
print(id(m))

sub_list[1] = "Venky"

print(l)
print(m)
print(id(l))
print(id(m))
```

```
[1, 2, 3, ['a', 'b', 'c']]
[1, 2, 3, ['a', 'b', 'c']]
137998967924096
137998970496960
[1, 2, 3, ['a', 'Venky', 'c']]
[1, 2, 3, ['a', 'Venky', 'c']]
137998967924096
137998970496960
```

```
import copy

sub_list = ["a","b","c"]
l = [1,2,3,sub_list]
m = copy.deepcopy(l)
print(l)
print(m)
print(id(l))
print(id(m))

sub_list[1] = "Venky"

print(l)
print(m)
print(id(l))
print(id(m))
```

```
[1, 2, 3, ['a', 'b', 'c']]
[1, 2, 3, ['a', 'b', 'c']]
137998968143040
137998968140544
[1, 2, 3, ['a', 'Venky', 'c']]
[1, 2, 3, ['a', 'b', 'c']]
137998968143040
137998968140544
```

```
t = (1,2,3)
t2 = (1,2,3)
print(id(t))
print(id(t2))
```

```
137998967655360
137998968184832
```

Updating a tuple

```
t = ("python", "c", "c++")

t[1] = "Java"
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-41-429fecf0ddd8> in <cell line: 3>()
      1 t = ("python", "c", "c++")
      2
----> 3 t[1] = "Java"

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

Next steps: Explain error

```
temp = list(t)
print(temp)
```

```
['python', 'c', 'c++']
```

```
temp[1] = "Java"
print(temp)
```

```
['python', 'Java', 'c++']
```

```
t = tuple(temp)
print(t)
```

```
('python', 'Java', 'c++')
```

```
l = [1,2,3,4,5]

del l[1:3]
print(l)
```

```
[1, 4, 5]
```

```
l = (1,2,3,4,5)

del l[1:3]
print(l)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-47-4bf3e81e433d> in <cell line: 3>()
      1 l = (1,2,3,4,5)
      2
----> 3 del l[1:3]
      4 print(l)

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

Next steps: Explain error

```
l = (1,2,3,4,5)

del l
```

```
l
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-49-cde25b5e10ad> in <cell line: 1>()
----> 1 l

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

Next steps: Explain error

```
# sort
# sorted

l = [1,10,5,8,9,12,11]
print(l)
print(id(l))
l.sort() # inplace sorting
print(l)
print(id(l))
```

```
[1, 10, 5, 8, 9, 12, 11]
137998967822912
[1, 5, 8, 9, 10, 11, 12]
137998967822912
```

```
l = [1,10,5,8,9,12,11]
print(l)
print(id(l))
print(sorted(l))
print(id(sorted(l))) # out of place sorting
print(l)
print(id(l))
```

```
[1, 10, 5, 8, 9, 12, 11]
137998967829568
[1, 5, 8, 9, 10, 11, 12]
137998968352320
[1, 10, 5, 8, 9, 12, 11]
137998967829568
```

```
l = [1,2,3,5,7,9,4]
sorted(l, reverse = True)
```

```
[9, 7, 5, 4, 3, 2, 1]
```

```
m = l.sort()
print(m)
print(type(m))
```

```
None
<class 'NoneType'>
```

```
l = [1,10,5,8,9,12,11]
print(l)
print(id(l))
l.sort(reverse=True) # inplace sorting
print(l)
print(id(l))
```

```
[1, 10, 5, 8, 9, 12, 11]
137998968143744
[12, 11, 10, 9, 8, 5, 1]
137998968143744
```

```
l = ['a','b','d','z','f']
l.sort()
print(l)
```

```
['a', 'b', 'd', 'f', 'z']
```

```
ord('f')
```

```
102
```

```
ord('z')
```

```
122
```

```
l = ['abc', 'aac', 'aca', 'cab','bca']
l.sort()
print(l)
```

```
['aac', 'abc', 'aca', 'bca', 'cab']
```

```
l = ['abc', 'aac', 'aca', 'cab','bca', "9", "10"]
l.sort()
print(l)
```

```
['10', '9', 'aac', 'abc', 'aca', 'bca', 'cab']
```

```
ord("1")
```

```
49
```

```
ord("9")
```

```
57
```

```
l = ["8948279632687268", "9"]
l.sort()
print(l)
```

```
['8948279632687268', '9']
```

```
l = [" ", "1", "a"]

l.sort(reverse=True)
l
```

```
['a', '1', ' ']
```

```
ord(" ")
```

```
32
```

```
ord("0")
```

```
48
```

```
ord("a")
```

```
97
```

```
# sort

# sorted

t = (1,2,3,5,7,9,4,12,10)

t.sort() # will fail
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-72-4ab51a335657> in <cell line: 7>()
      5 t = (1,2,3,5,7,9,4,12,10)
      6
----> 7 t.sort() # will fail

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

Next steps: Explain error

```
sorted(t) # always returns list object
```

```
[1, 2, 3, 4, 5, 7, 9, 10, 12]
```

```
sorted("Venky")
```

```
['V', 'e', 'k', 'n', 'y']
```

```
# reverse
l = list("Venkatesh")
print(l)
```

```
['V', 'e', 'n', 'k', 'a', 't', 'e', 's', 'h']
```

```
l.reverse() # equivalent to l[::-1]
print(l)  # reverse in place
```

```
['h', 's', 'e', 't', 'a', 'k', 'n', 'e', 'V']
```

```
list(reversed(l)) # out of place - creates new list
```

```
['V', 'e', 'n', 'k', 'a', 't', 'e', 's', 'h']
```

```
t = tuple("Venkatesh")

t.reverse()
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-79-4581c60decf7> in <cell line: 3>()
      1 t = tuple("Venkatesh")
      2
----> 3 t.reverse()

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

Next steps: Explain error

```
tuple(reversed(t))
```

```
('h', 's', 'e', 't', 'a', 'k', 'n', 'e', 'V')
```

```
# count

l = [1,2,3,1,2,4,3,2,1,3,2,1,5,2,1,4,5]

l.count(1)
```

```
5
```

```
l.count(6)
```

```
0
```

```
l = (1,2,3,1,2,4,3,2,1,3,2,1,5,2,1,4,5)

l.count(1)
```

```
5
```

```
k = "lkaslads"

k.count("l")
```

```
2
```

SETS

1. Initializing a set
2. Accessing Set Items
3. How to add items to the set?
4. How to remove items from the set?
5. Methods supported in sets
    - union
    - intersection
    - difference
    - subset, superset, disjoint

```
# initializing a set

s = {}
print(s)
print(type(s))
```

```
{}
<class 'dict'>
```

```
s = {1}
print(s)
print(type(s))
```

```
{1}
<class 'set'>
```

```
s = set()
print(s)
print(type(s))
```

```
set()
<class 'set'>
```

```
s = {1,2,3,4,5}
print(s)
print(id(s))
s.add(8)
print(s)
print(id(s))
```

```
{1, 2, 3, 4, 5}
137998970011008
{1, 2, 3, 4, 5, 8}
137998970011008
```

```
s = {1,2,3,4,5,[1,2]}
print(s)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-90-3e79ceb38818> in <cell line: 1>()
----> 1 s = {1,2,3,4,5,[1,2]}
      2 print(s)

TypeError: unhashable type: 'list'
```

Next steps: Explain error

```
s = {1,2,3,4,5,{1,2}}
print(s)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-91-732e5c9c3a70> in <cell line: 1>()
----> 1 s = {1,2,3,4,5,{1,2}}
      2 print(s)

TypeError: unhashable type: 'set'
```

Next steps: Explain error

```
s = {1,2,3,4,5,{1:2,2:4}}
print(s)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-92-b5b73c131665> in <cell line: 1>()
----> 1 s = {1,2,3,4,5,{1:2,2:4}}
      2 print(s)

TypeError: unhashable type: 'dict'
```

Next steps: Explain error

```
s = {2,3,(2,3,5)}
print(s)
```

```
{2, 3, (2, 3, 5)}
```

```
t = (2,3,4,[3,5])

s = {1,2,t}
print(s)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-94-3ba36d79cc48> in <cell line: 3>()
      1 t = (2,3,4,[3,5])
      2
----> 3 s = {1,2,t}
      4 print(s)

TypeError: unhashable type: 'list'
```

Next steps: Explain error

```
# 1 , 1.0, True
# 0, 0.0, False

# above ones are treated as same in set

s = {1, True}
print(s)
```

```
{1}
```

```
hash(1)
```

```
1
```

```
hash(True)
```

```
1
```

```
hash((1,2,3,[12,3]))
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-99-4b690c351a77> in <cell line: 1>()
----> 1 hash((1,2,3,[12,3]))

TypeError: unhashable type: 'list'
```

Next steps: Explain error

```
len({1,2,3,5,7,10,5})
```

```
6
```

```
# accessing a set

s = {"Venky", "Rajini", "Kamal", "Allu Arjun", "Ramcharan"}

s[0]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-102-3fb356273ebc> in <cell line: 5>()
      3 s = {"Venky", "Rajini", "Kamal", "Allu Arjun", "Ramcharan"}
      4
----> 5 s[0]

TypeError: 'set' object is not subscriptable
```

Next steps: Explain error

```
"Venky" in s
```

```
True
```

```
s = {1,2,5.4,"abc", "1234",2.3,5}
print(s)
```

```
{1, 2, 2.3, '1234', 5, 5.4, 'abc'}
```

```
# adding a element to set and updating a set

s = {10,20,30}
s.add(40)
print(s)
```

```
{40, 10, 20, 30}
```

```
s.add(70,50,60)
print(s)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-108-b14951065390> in <cell line: 1>()
----> 1 s.add(70,50,60)
      2 print(s)

TypeError: set.add() takes exactly one argument (3 given)
```

Next steps: Explain error

```
s.add((70,50,60))
print(s)
```

```
{40, 10, 20, (70, 50, 60), 30}
```

```
s.add((10,20,30))
print(s)
```

```
{40, 10, (10, 20, 30), 20, (70, 50, 60), 30}
```

```
s = {10,20,30}
# update
t = {40,50,60}
s.update(t) # {10,20,30,40,50,60}
print(s)
```

```
{50, 20, 40, 10, 60, 30}
```

```
s.union(t)
```

```
{10, 20, 30, 40, 50, 60}
```

```
s = {1,2,3}
t = {4,5,6}
s.union(t)
```

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

```
print(s)
print(t)
```

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

```
s = {1,2,3}
t = {4,5,6}
s.update(t)
s
```

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

```
t2 = [10,20,30]
s.update(t2)
```

```
s.union(t2)
```

```
{1, 2, 3, 4, 5, 6, 10, 20, 30}
```

```
t2.union(s)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-122-19ca52e21cfd> in <cell line: 1>()
----> 1 t2.union(s)

AttributeError: 'list' object has no attribute 'union'
```

Next steps: Explain error

```
a = {1,2,3}
b = [5,7,8, 3]

a.union(b)
```

```
{1, 2, 3, 5, 7, 8}
```

```
s
```

```
{1, 2, 3, 4, 5, 6, 10, 20, 30}
```

```
print(s)
```

```
{1, 2, 3, 4, 5, 6, 10, 20, 30}
```

```
s ={1,2,3}
s.update("RBR")
print(s)
```

```
{1, 2, 3, 'R', 'B'}
```

```
s ={1,2,3}
s.update(["RBR"])
print(s)
```

```
{1, 2, 3, 'RBR'}
```

Remove Method

```
s = {"Virat", "Rohit", "Dube", "Hardik"}

s.remove("Dube")
print(s)
```

```
{'Virat', 'Hardik', 'Rohit'}
```

```
s.remove("Dhoni")
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
<ipython-input-127-ce98e0177a2b> in <cell line: 1>()
----> 1 s.remove("Dhoni")

KeyError: 'Dhoni'
```

Next steps: Explain error

```
# discard

s = {"Virat", "Rohit", "Dube", "Hardik"}

s.discard("Dube")
print(s)
```

```
{'Virat', 'Hardik', 'Rohit'}
```

```
s.discard("Dhoni")
print(s)
```

```
{'Virat', 'Hardik', 'Rohit'}
```

```
# pop

l = {1,2,3,4,5,"abc","12",1.5,24}

print(l.pop())
print(l)
```

```
1
{2, 3, 4, 5, 1.5, '12', 24, 'abc'}
```

```
print(l.pop())
print(l)
```

```
2
{3, 4, 5, 1.5, '12', 24, 'abc'}
```

```
print(l.pop(0))
print(l)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-134-6954417f0602> in <cell line: 1>()
----> 1 print(l.pop(0))
      2 print(l)

TypeError: set.pop() takes no arguments (1 given)
```

Next steps: Explain error

Operations on Set

```
# UNION

s = {1,2,3}
t = {4,5,6}
s.union(t)
```

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

```
# union ---> |

a = {10,20,30}
b = {40,50,60}
a | b
```

```
{10, 20, 30, 40, 50, 60}
```

```
a = {1,2,3}
b = {4,5,6}
c = {7,8,9}
d = {10,11,12}
e = (14,15,16)
f = [17,18,19]
g = "Venky"

a.union(b,c,d,e,f,g)
```

```
{1,
 10,
 11,
 12,
 14,
 15,
 16,
 17,
 18,
 19,
 2,
 3,
 4,
 5,
 6,
 7,
 8,
 9,
 'V',
 'e',
 'k',
 'n',
 'y'}
```

```
a = {1,2,3}
b = {4,5,6}
c = {7,8,9}
d = {10,11,12}
e = (14,15,16)
f = [17,18,19]
g = "Venky"

a | b | c | d
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
```

```
a | b | c| d | e | f | g
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-140-2192ed8bc5d1> in <cell line: 1>()
----> 1 a | b | c| d | e | f | g

TypeError: unsupported operand type(s) for |: 'set' and 'tuple'
```

Next steps: Explain error

```
# intersection

a = {1,2,3,4}
b = {2,3,5,7}

a.intersection(b)
```

```
{2, 3}
```

```
print(a)
```

```
{1, 2, 3, 4}
```

```
a = {1,2,3,4}
b = {2,3,5,7}
c = {10,20,30,40,3}

a.intersection(b,c)
```

```
{3}
```

```
# &

a & b & c
```

```
{3}
```

```
a = {1,2,3}
b = [2,3,4]

a.intersection(b)
```

```
{2, 3}
```

```
a & b
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-147-4adaaec0a063> in <cell line: 1>()
----> 1 a & b

TypeError: unsupported operand type(s) for &: 'set' and 'list'
```

Next steps: Explain error

```
# update , union

# intersection_update, intersection

a = {1,2,3,4}
b = {2,3,5,7}
a.intersection(b)
```

```
{2, 3}
```

```
print(a)
```

```
{1, 2, 3, 4}
```

```
a.intersection_update(b)
```

```
a
```

```
{2, 3}
```

```
a = {1,2,3,4}
b = {2,3,5,7}

a &= b

# &= -> intersection_update
# & -> intersection
# | -> union
# |= -> update
```

```
a
```

```
{2, 3}
```

```
a = {1,2,3,4}
b = {2,3,5,7}

a |= b
```

```
a
```

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

```
# difference

a = {1,2,3,4}
b = {2,3,5,7}

a.difference(b)
```

```
{1, 4}
```

```
a
```

```
{1, 2, 3, 4}
```

```
a-b
```

```
{1, 4}
```

```
a
```

```
{1, 2, 3, 4}
```

```
a.difference_update(b)
```

```
a
```

```
{1, 4}
```

```
# -=  ---> difference_update

a = {1,2,3,4}
b = {2,3,5,7}
a-=b
print(a)
```

```
{1, 4}
```

```
# symmetric_difference

gate_da = {"ML", "Python", "LA", "Calculus", "Aptitude"}

gate_cs = {"OS", "C++", "LA", "Calculus", "Aptitude"}

gate_da.symmetric_difference(gate_cs)
```

```
{'C++', 'ML', 'OS', 'Python'}
```

```
# ^
gate_da ^ gate_cs
```

```
{'C++', 'ML', 'OS', 'Python'}
```

```
gate_da.symmetric_difference_update(gate_cs)


print(gate_da)
print(gate_cs)
```

```
{'C++', 'OS', 'Python', 'ML'}
{'C++', 'OS', 'Aptitude', 'LA', 'Calculus'}
```

```
# ^= ---> symmetric_difference_update


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

a.clear()


a
```

```
set()
```

```
a = {1,2,3,4,5,6}

del a


a
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-171-3f786850e387> in <cell line: 1>()
----> 1 a

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

Next steps: Explain error

```
a = {1,2,3,5}
b = a.copy()


# isdisjoint

a = {1,2,3,4}
b = {2,3,5,7}

a.isdisjoint(b)
```

```
False
```

```
a = {1,2,3,4}
b = {10,15,5,7}

a.isdisjoint(b)
```

```
True
```

```
# issuperset

a = {1,2,3,4}
b ={2,3,5,7}

a.issuperset(b)
```

```
False
```

```
a = {1,2,3,4,5,7,8}
b ={2,3,5,7}

a.issuperset(b)
```

```
True
```

```
b.issuperset(a)
```

```
False
```

```
# subset

a = {1,2,3,5}
b = {1,2}

a.issubset(b)
```

```
False
```

```
a = {1,2,3,5}
b = {1,2}

b.issubset(a)
```

```
True
```

Frozen Sets

```
f = frozenset([])
print(f)
print(type(f))
```

```
frozenset()
<class 'frozenset'>
```

```
f = frozenset([10,20,30,1,True,0,False])
print(f)
print(type(f))
```

```
frozenset({0, 1, 10, 20, 30})
<class 'frozenset'>
```

```
f.add(12)
```