Sets

In [1]:
```
myset = {1,2,3,4,5} #set of numbers
myset
```

Out[1]:
```
{1, 2, 3, 4, 5}
```

In [2]:
```
len(myset)  #length  of numbers
```

Out[2]:
```
5
```

In [3]:
```
my_set = {1,1,2,2,3,4,5,5}   #Duplicate items are not allowed
my_set
```

Out[3]:
```
{1, 2, 3, 4, 5}
```

In [35]:
```
myset1 = {1.79,2.08,3.99,4.56,5.45}   #set of float numbers
myset1
```

Out[35]:
```
{1.79, 2.08, 3.99, 4.56, 5.45}
```

In [6]:
```
myset2 = {'Asif','John','Tyrion'} #set of strings
myset2
```

Out[6]:
```
{'Asif', 'John', 'Tyrion'}
```

In [7]:
```
myset3 = {10,20,"Hola", (11,22,32)}  #Mixed datatypes
myset3
```

Out[7]:
```
{(11, 22, 32), 10, 20, 'Hola'}
```

In [8]:
```
myset3 = {10,20, "Hola", [11,22,32]}  #set doesn't allow mutable items like list.
myset3
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[8], line 1
----> 1 myset3 = {10,20, "Hola", [11,22,32]}
      2 myset3

TypeError: unhashable type: 'list'
```

In [10]:
```
myset4 = set()
print(type(myset4)) #creation of empty set
```

```
<class 'set'>
```

In [12]:
```
my_set1 = set(('one','two','three','four'))
```

In [13]:
```
my_set1
```

Out[13]:
```
{'four', 'one', 'three', 'two'}
```

In [ ]:
```
```

Loop through a set

In [ ]:
```
```

In [30]:
```
myset = {'one','two','three','four','five','six','seven','eight'}
```

In [15]:
```
for i in myset:
    print(i)
```

```
four
three
six
eight
seven
one
five
two
```

In [16]:
```
for i in enumerate(myset):
    print(i)
```

```
(0, 'four')
(1, 'three')
(2, 'six')
(3, 'eight')
(4, 'seven')
(5, 'one')
(6, 'five')
(7, 'two')
```

In [ ]:
```
```

Set Membership

In [ ]:
```
```

In [18]:
```
myset
```

Out[18]:
```
{'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [19]:
```
'one' in myset
```

Out[19]:
```
True
```

In [20]:
```
'ten' in myset
```

Out[20]:
```
False
```

In [21]:
```
if 'three' in myset:
    print('Three is present in the set')
else:
    print('Three is not present in the set')
```

```
Three is present in the set
```

In [22]:
```
if 'eleven' in myset:
    print('eleven is present in the set')
else:
    print('eleven is not present in the set')
```

```
eleven is not present in the set
```

In [ ]:
```

```

Add & Remove Items

In [ ]:
```

```

In [24]:
```
myset
```

Out[24]:
```
{'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [25]:
```
myset.add('NINE')
myset
```

Out[25]:
```
{'NINE', 'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [26]:
```
myset.update(['Ten','Eleven','Twelve'])
myset
```

Out[26]:
```
{'Eleven',
 'NINE',
 'Ten',
 'Twelve',
 'eight',
 'five',
 'four',
 'one',
 'seven',
 'six',
 'three',
 'two'}
```

In [27]:
```
myset.remove('NINE')
```

In [28]:
```
myset
```

Out[28]:
```
{'Eleven',
 'Ten',
 'Twelve',
 'eight',
 'five',
 'four',
 'one',
 'seven',
 'six',
 'three',
 'two'}
```

In [31]:
```
myset.discard('Ten')
```

In [32]:
```
myset
```

Out[32]:
```
{'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [33]:
```
myset.clear()
myset
```

Out[33]:
```
set()
```

In [34]:
```
del myset
myset
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[34], line 2
      1 del myset
----> 2 myset

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

In [ ]:

Copy set

In [ ]:

In [37]:
```
myset = {'one','two','three','four','five','six','seven','eight'}
myset
```

Out[37]:
```
{'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [38]:
```
myset1 = myset.copy()
myset1
```

Out[38]:
```
{'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}
```

In [39]:
```
id(myset) , id(myset1)
```

Out[39]: (1653697082560, 1653697079424)

In [40]:
```
my_set = myset.copy()
my_set
```

Out[40]: {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}

In [41]:
```
myset1
```

Out[41]: {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}

In [42]:
```
my_set
```

Out[42]: {'eight', 'five', 'four', 'one', 'seven', 'six', 'three', 'two'}

In [ ]:

Set Operation

In [ ]:

union

In [50]:
```
A = {1,2,3,4,5}
B = {4,5,6,7,8}
C = {8,9,10}
```

In [44]:
```
A | B
```

Out[44]: {1, 2, 3, 4, 5, 6, 7, 8}

In [46]:
```
A.union(B)
```

Out[46]: {1, 2, 3, 4, 5, 6, 7, 8}

In [51]:
```
A.union(B, C)
```

Out[51]: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

In [52]:
```
A.update(B,C)
```

In [53]:
```
A
```

Out[53]: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

In [ ]:

Intersection

In [ ]:

In [54]:
```
A = {1,2,3,4,5}
B = {4,5,6,7,8}
```

In [55]:
```
A - B
```

Out[55]: {1, 2, 3}

In [56]:
```
A.difference (B)
```

Out[56]: {1, 2, 3}

In [57]:
```
B - A
```

Out[57]: {6, 7, 8}

In [58]:
```
B.difference(A)
```

Out[58]: {6, 7, 8}

In [59]:
```
B.difference_update(A)
B
```

Out[59]: {6, 7, 8}

In [ ]:

Symmetric Difference

In [ ]:

In [61]:
```
A = {1,2,3,4,5}
B = {4,5,6,7,8}
```

In [62]:
```
A ^ B
```

Out[62]: {1, 2, 3, 6, 7, 8}

In [63]:
```
A.symmetric_difference(B)
```

Out[63]: {1, 2, 3, 6, 7, 8}

In [64]:
```
A.symmetric_difference_update(B)
```

In [65]:
```
A
```

Out[65]: {1, 2, 3, 6, 7, 8}

In [ ]:

Subset, Superset & Disjoint

In [ ]:

In [67]:
```
A = {1,2,3,4,5,6,7,8,9}
B = {3,4,5,6,7,8}
C = {10,20,30,40}
```

In [68]:
```
B.issubset(A)
```

Out[68]: True

In [69]:
```
A.issuperset(B)
```

Out[69]: True

In [70]:
```
C.isdisjoint(A)
```

Out[70]: True

In [71]:
```
B.isdisjoint(A)
```

Out[71]: False

In [72]:
```
A
```

Out[72]: {1, 2, 3, 4, 5, 6, 7, 8, 9}

In [73]:
```
sum(A)
```

Out[73]: 45

In [74]:
```
max(A)
```

Out[74]: 9

In [75]:
```
min(A)
```

Out[75]: 1

In [76]:
```
len(A)
```

Out[76]: 9

In [78]:
```
list(enumerate(A))
```

Out[78]: [(0, 1), (1, 2), (2, 3), (3, 4), (4, 5), (5, 6), (6, 7), (7, 8), (8, 9)]

In [79]:
```
D = sorted(A, reverse=True)
```

In [80]:
```
D
```

Out[80]: [9, 8, 7, 6, 5, 4, 3, 2, 1]

In [81]:
```
sorted(D)
```

Out[81]: [1, 2, 3, 4, 5, 6, 7, 8, 9]

In [ ]:

Dictionary

In [ ]:

Create Dictionary

In [ ]:

In [82]:
```
mydict = dict()
mydict
```

Out[82]: {}

In [83]:
```
mydict = {}
mydict
```

Out[83]: {}

In [84]:
```
mydict = {1:'one',2:'two',3:'three'}
mydict
```

Out[84]: {1: 'one', 2: 'two', 3: 'three'}

In [85]:
```
mydict = dict({1:'one',2:'two',3:'three'})
mydict
```

Out[85]: {1: 'one', 2: 'two', 3: 'three'}

In [86]:
```
mydict = {'A':'one', 'B':'two', 'C':'three'}
mydict
```

Out[86]: {'A': 'one', 'B': 'two', 'C': 'three'}

In [87]:
```
mydict = {1:'one', 'A':'two', 3:'three'}
mydict
```

Out[87]:
```
{1: 'one', 'A': 'two', 3: 'three'}
```

In [88]:
```
mydict.keys()
```

Out[88]:
```
dict_keys([1, 'A', 3])
```

In [89]:
```
mydict.values()
```

Out[89]:
```
dict_values(['one', 'two', 'three'])
```

In [90]:
```
mydict.items()
```

Out[90]:
```
dict_items([(1, 'one'), ('A', 'two'), (3, 'three')])
```

In [91]:
```
mydict = {1:'one', 2:'two', 'A':['asif','john','maria']}
mydict
```

Out[91]:
```
{1: 'one', 2: 'two', 'A': ['asif', 'john', 'maria']}
```

In [92]:
```
mydict = {1:'one', 2:'two', 'A':{'Name':'asif','Age':20}, 'B':('Bat','cat','hat')}
mydict
```

Out[92]:
```
{1: 'one',
 2: 'two',
 'A': {'Name': 'asif', 'Age': 20},
 'B': ('Bat', 'cat', 'hat')}
```

In [94]:
```
keys = {'a','b','c','d'}
mydict3 = dict.fromkeys(keys)
mydict3
```

Out[94]:
```
{'c': None, 'a': None, 'd': None, 'b': None}
```

In [95]:
```
keys = {'a','b','c','d'}
value = [10]
mydict3 = dict.fromkeys(keys, value)
mydict3
```

Out[95]:
```
{'c': [10], 'a': [10], 'd': [10], 'b': [10]}
```

In [96]:
```
keys = {'a','b','c','d'}
value = [10,20,30]
mydict3 = dict.fromkeys(keys, value)
mydict3
```

Out[96]:
```
{'c': [10, 20, 30], 'a': [10, 20, 30], 'd': [10, 20, 30], 'b': [10, 20, 30]}
```

In [97]:
```
value.append(40)
mydict3
```

Out[97]:
```
{'c': [10, 20, 30, 40],
 'a': [10, 20, 30, 40],
 'd': [10, 20, 30, 40],
 'b': [10, 20, 30, 40]}
```

Accessing Items

In [99]:
```
mydict = {1:'one',2:'two',3:'three',4:'four'}
mydict
```

Out[99]:
```
{1: 'one', 2: 'two', 3: 'three', 4: 'four'}
```

In [100…
```
mydict[1]
```

Out[100…
```
'one'
```

In [101…
```
mydict.get(1)
```

Out[101…
```
'one'
```

In [102…
```
mydict1 = {'Name':'Asif', 'ID':74123, 'DOB':1991, 'Job':'Analyst'}
mydict1
```

Out[102…
```
{'Name': 'Asif', 'ID': 74123, 'DOB': 1991, 'Job': 'Analyst'}
```

In [103…
```
mydict1['Name']
```

Out[103…
```
'Asif'
```

In [104…
```
mydict1.get('Job')
```

Out[104…
```
'Analyst'
```

In [ ]:

Add,Remoove & Change Items

In [ ]:

In [137…
```
mydict1 = {'Name':'Asif', 'ID':12345, 'DOB':1991, 'Address':'Hilsinki'}
mydict1
```

Out[137…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Hilsinki'}
```

In [140…
```
mydict1['DOB']
mydict1['Address'] = 'Delhi'
mydict1
```

Out[140…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Delhi'}
```

In [141…
```
mydict1
```

Out[141…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1991, 'Address': 'Delhi'}
```

In [142…
```
dict1 = {'DOB':1995}
mydict1.update(dict1)
mydict1
```

Out[142…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1995, 'Address': 'Delhi'}
```

In [143…
```
mydict1['Job'] = 'Analyst'
mydict1
```

Out[143…
```
{'Name': 'Asif',
 'ID': 12345,
 'DOB': 1995,
 'Address': 'Delhi',
 'Job': 'Analyst'}
```

In [144…
```
mydict1.pop('Job')
mydict1
```

Out[144…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1995, 'Address': 'Delhi'}
```

In [145…
```
mydict1.popitem()
```

Out[145…
```
('Address', 'Delhi')
```

In [146…
```
mydict1
```

Out[146…
```
{'Name': 'Asif', 'ID': 12345, 'DOB': 1995}
```

In [147…
```
del[mydict1['ID']]
mydict1
```

Out[147…
```
{'Name': 'Asif', 'DOB': 1995}
```

In [148…
```
del mydict1
```

In [150…
```
mydict1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[150], line 1
----> 1 mydict1

NameError: name 'mydict1' is not defined
```

In [ ]:

Copy Dictionary

In [ ]:

In [151…
```
mydict = {'Name':'Asif','ID':12344, 'DOB':1991, 'Adress':'Hilsinki'}
mydict
```

Out[151…
```
{'Name': 'Asif', 'ID': 12344, 'DOB': 1991, 'Adress': 'Hilsinki'}
```

In [152…
```
mydict1 = mydict
```

In [153…
```
id(mydict), id(mydict1)
```

Out[153…
```
(1653736406976, 1653736406976)
```

In [154…
```
mydict2 = mydict.copy()
mydict2
```

Out[154…
```
{'Name': 'Asif', 'ID': 12344, 'DOB': 1991, 'Adress': 'Hilsinki'}
```

In [156…
```
mydict['Adress'] = 'Mumbai'
mydict
```

Out[156…
```
{'Name': 'Asif', 'ID': 12344, 'DOB': 1991, 'Adress': 'Mumbai'}
```

In [157…
```
mydict1
```

Out[157…
```
{'Name': 'Asif', 'ID': 12344, 'DOB': 1991, 'Adress': 'Mumbai'}
```

In [158…
```
mydict2
```

Out[158…
```
{'Name': 'Asif', 'ID': 12344, 'DOB': 1991, 'Adress': 'Hilsinki'}
```

In [ ]:

Loop through a Dictionary

In [ ]:

In [159…
```
mydict1 = {'Name':'Saad', 'ID':12345,'DOB':1991, 'Adress': 'Hyderabad', 'Job':'Anal
mydict1
```

Out[159…
```
{'Name': 'Saad',
 'ID': 12345,
 'DOB': 1991,
 'Adress': 'Hyderabad',
 'Job': 'Analyst'}
```

In [163…
```
for i in mydict1:
    print(i, ':' , mydict1[i])
```

```
Name : Saad
ID : 12345
DOB : 1991
Adress : Hyderabad
Job : Analyst
```

In [166…
```
for i in mydict1:
    print(mydict1[i])
```

```
Saad
12345
1991
Hyderabad
Analyst
```

In [ ]:

Dictionary Membership

In [ ]:

In [168…
```
mydit1 = {'Name':'Saad', 'ID': 12345 , 'DOB': 1991 ,'Adress': 'Hyderabad', 'Job': '
mydict1
```

Out[168…
```
{'Name': 'Saad',
 'ID': 12345,
 'DOB': 1991,
 'Adress': 'Hyderabad',
 'Job': 'Analyst'}
```

In [169…
```
'Name' in mydict1
```

Out[169… True

In [170…
```
'Saad' in mydict1
```

Out[170… False

In [171…
```
'ID' in mydict1
```

Out[171… True

In [172…
```
'Adress' in mydict1
```

Out[172… True

In [ ]:

ALL / ANY

In [173…
```
mydict1
```

Out[173…
```
{'Name': 'Saad',
 'ID': 12345,
 'DOB': 1991,
 'Adress': 'Hyderabad',
 'Job': 'Analyst'}
```

In [174…
```
all(mydict1)
```

Out[174…
```
True
```

In [ ]: