Day 08 – Dictionaries in Python

Learn about dictionaries in Python, including how to create, access, update, delete, and iterate through key-value pairs.

What is a Dictionary?

A **dictionary** in Python is an unordered, mutable collection of key-value pairs.

Key Features:

- Defined using curly braces `{}`
- Keys must be unique and immutable (e.g., strings, numbers, tuples)
- Values can be of any data type
- Supports fast lookup by key

Use Cases: storing structured data like JSON, configs, user profiles, etc.

1. Create a Dictionary

```
In [1]: mydict = dict() # empty dictionary
        mydict
```

```
Out[1]: {}
```

```
In [2]: mydict = {} # empty dictionary
        mydict
```

```
Out[2]: {}
```

```
In [3]: mydict = {1:'one' , 2:'two' , 3:'three'} # dictionary with integer keys
        mydict
```

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

```
In [4]: mydict = dict({1:'one' , 2:'two' , 3:'three'}) # Create dictionary using dict()
        mydict
```

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

```
In [5]: mydict = {'A':'one' , 'B':'two' , 'C':'three'} # dictionary with character keys
        mydict
```

```
Out[5]: {'A': 'one', 'B': 'two', 'C': 'three'}
```

```
In [6]: mydict = {1:'one' , 'A':'two' , 3:'three'} # dictionary with mixed keys
        mydict
```

```
Out[6]: {1: 'one', 'A': 'two', 3: 'three'}
```

```
In [7]: mydict.keys() # Return Dictionary Keys using keys() method
```

```
Out[7]: dict_keys([1, 'A', 3])
```

```
In [8]: mydict.values() # Return Dictionary Values using values() method
```

```
Out[8]: dict_values(['one', 'two', 'three'])
```

```
In [9]:   mydict.items() # Access each key-value pair within a dictionary
```

```
Out[9]:   dict_items([(1, 'one'), ('A', 'two'), (3, 'three')])
```

```
In [10]:  mydict = {1:'one' , 2:'two' , 'A':['asif' , 'john' , 'Maria']} # dictionary with
          mydict
```

```
Out[10]:  {1: 'one', 2: 'two', 'A': ['asif', 'john', 'Maria']}
```

```
In [12]:  mydict = {1:'one' , 2:'two' , 'A':['asif' , 'john' , 'Maria'], 'B':('Bat' , 'cat', 'hat')}
          mydict
```

```
Out[12]:  {1: 'one',
           2: 'two',
           'A': ['asif', 'john', 'Maria'],
           'B': ('Bat', 'cat', 'hat')}
```

```
In [13]:  keys = {'a' , 'b' , 'c' , 'd'}
          mydict3 = dict.fromkeys(keys) # Create a dictionary from a sequence of keys
          mydict3
```

```
Out[13]:  {'d': None, 'b': None, 'a': None, 'c': None}
```

```
In [15]:  keys = {'a' , 'b' , 'c' , 'd'}
          value = 10
          mydict3 = dict.fromkeys(keys , value) # Create a dictionary from a sequence of
          mydict3
```

```
Out[15]:  {'d': 10, 'b': 10, 'a': 10, 'c': 10}
```

```
In [16]:  keys = {'a' , 'b' , 'c' , 'd'}
          value = [10,20,30]
          mydict3 = dict.fromkeys(keys , value) # Create a dictionary from a sequence of
          mydict3
```

```
Out[16]:  {'d': [10, 20, 30], 'b': [10, 20, 30], 'a': [10, 20, 30], 'c': [10, 20, 30]}
```

```
In [17]:  value.append(40)
          mydict3
```

```
Out[17]:  {'d': [10, 20, 30, 40],
           'b': [10, 20, 30, 40],
           'a': [10, 20, 30, 40],
           'c': [10, 20, 30, 40]}
```

2. Accessing Items

```
In [18]:  mydict = {1:'one' , 2:'two' , 3:'three' , 4:'four'}
          mydict
```

```
Out[18]:  {1: 'one', 2: 'two', 3: 'three', 4: 'four'}
```

```
In [19]:  mydict[1] # Access item using key
```

```
Out[19]:  'one'
```

```
In [20]:  mydict.get(1) # Access item using get() method
```

```
Out[20]:  'one'
```

```
In [21]:  mydict1 = {'Name':'Arman' , 'ID': 74123 , 'DOB': 2003 , 'job' :'Analyst'}
          mydict1
```

```
Out[21]:  {'Name': 'Arman', 'ID': 74123, 'DOB': 2003, 'job': 'Analyst'}
```

```
In [22]:  mydict1['Name'] # Access item using key
```

```
Out[22]:  'Arman'
```

```
In [23]:  mydict1.get('job') # Access item using get() method
```

```
Out[23]:  'Analyst'
```

3. Add, Remove & Change Items

```
In [24]:  mydict1 = {'Name':'Arman' , 'ID': 12345 , 'DOB': 2003 , 'Address' : 'Mumbai'}
          mydict1
```

```
Out[24]:  {'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Address': 'Mumbai'}
```

```
In [25]:  mydict1['DOB'] = 1992 # Changing Dictionary Items
          mydict1['Address'] = 'Delhi'
          mydict1
```

```
Out[25]:  {'Name': 'Arman', 'ID': 12345, 'DOB': 1992, 'Address': 'Delhi'}
```

```
In [26]:  dict1 = {'DOB':1995}
          mydict1.update(dict1)
          mydict1
```

```
Out[26]:  {'Name': 'Arman', 'ID': 12345, 'DOB': 1995, 'Address': 'Delhi'}
```

```
In [27]:  mydict1['Job'] = 'Analyst' # Adding items in the dictionary
          mydict1
```

```
Out[27]:  {'Name': 'Arman',
           'ID': 12345,
           'DOB': 1995,
           'Address': 'Delhi',
           'Job': 'Analyst'}
```

```
In [28]:  mydict1.pop('Job') # Removing items in the dictionary using Pop method
          mydict1
```

```
Out[28]:  {'Name': 'Arman', 'ID': 12345, 'DOB': 1995, 'Address': 'Delhi'}
```

```
In [29]:  mydict1.popitem() # A random item is removed
```

```
Out[29]:  ('Address', 'Delhi')
```

```
In [30]:  mydict1
```

```
Out[30]:  {'Name': 'Arman', 'ID': 12345, 'DOB': 1995}
```

```
In [31]:  del[mydict1['ID']] # Removing item using del method
          mydict1
```

```
Out[31]:  {'Name': 'Arman', 'DOB': 1995}
```

```
In [32]:  mydict1.clear() # Delete all items of the dictionary using clear method
          mydict1
```

```
Out[32]:  {}
```

```
In [33]:  del mydict1 # Delete the dictionary object
          mydict1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[33], line 2
      1 del mydict1 # Delete the dictionary object
----> 2 mydict1

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

4. Copy Dictionary

In [35]: `mydict = {'Name':'Arman' , 'ID': 12345 , 'DOB': 2003 , 'Address' : 'Mumbai'}`
`mydict`

Out[35]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Address': 'Mumbai'}`

In [36]: `mydict1 = mydict # Create a new reference "mydict1"`

In [37]: `id(mydict) , id(mydict1) # The address of both mydict & mydict1 will be the same`

Out[37]: `(2110171527744, 2110171527744)`

In [38]: `mydict2 = mydict.copy() # Create a copy of the dictionary`

In [39]: `id(mydict2) # The address of mydict2 will be different from mydict because mydic`

Out[39]: `2110171525312`

In [40]: `mydict['Address'] = 'Chennai'`

In [41]: `mydict`

Out[41]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Address': 'Chennai'}`

In [42]: `mydict1`

Out[42]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Address': 'Chennai'}`

In [43]: `mydict2`

Out[43]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Address': 'Mumbai'}`

5. Loop through a Dictionary

In [44]: `mydict1 = {'Name':'Arman' , 'ID': 12345 , 'DOB': 2003 , 'Address' : 'Mumbai' ,'Job': 'Analyst'}`
`mydict1`

Out[44]:
```
{'Name': 'Arman',
 'ID': 12345,
 'DOB': 2003,
 'Address': 'Mumbai',
 'Job': 'Analyst'}
```

In [45]:
```
for i in mydict1:
    print(i , ':' , mydict1[i])
```

```
Name : Arman
ID : 12345
DOB : 2003
Address : Mumbai
Job : Analyst
```

In [46]:
```
for i in mydict1:
    print(mydict1[i]) # Dictionary items
```

```
Arman
12345
2003
Mumbai
Analyst
```

6. Dictionary Membership

In [50]:
```python
mydict1 = {'Name':'Arman' , 'ID': 12345 , 'DOB': 1991 , 'Job': 'Analyst'}
mydict1
```

Out[50]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 1991, 'Job': 'Analyst'}`

In [51]:
```python
'Name' in mydict1 # Test if a key is in a dictionary or not.
```

Out[51]: True

In [52]:
```python
'Arman' in mydict1 # Membership test can be only done for keys.
```

Out[52]: False

In [53]:
```python
'ID' in mydict1
```

Out[53]: True

In [54]:
```python
'Address' in mydict1
```

Out[54]: False

7. all() and any() with Dictionaries

In [55]:
```python
mydict1 = {'Name':'Arman' , 'ID': 12345 , 'DOB': 2003 , 'Job': 'Analyst'}
mydict1
```

Out[55]: `{'Name': 'Arman', 'ID': 12345, 'DOB': 2003, 'Job': 'Analyst'}`

In [56]:
```python
all(mydict1) # Will Return false as one value is false (Value 0)
```

Out[56]: True