Dictionary

Python dictionary is an unordered collection of items. While other compound data types have only value as an element, a dictionary has a key: value pair.

Dict Creation

In [ ]:

```
#empty dictionary
y_dict = {}
y_dict

# dict={key1:value1,key2:value2,...,}
```

Out[7]:

```
{}
```

In [ ]:

```
x=dict()
print(type(x))
x
```

```
<class 'dict'>
```

Out[4]:

```
{}
```

In [ ]:

```
#dictionary with integer keys, text values
#           1=key, 'user1'=value
designations = {101: 'CEO', 102: 'Manager',103:'Engineer', 104:'Intern'}
print(designations)
```

```
{101: 'CEO', 102: 'Manager', 103: 'Engineer', 104: 'Intern'}
```

In [ ]:

```
designations[101]
```

Out[11]:

```
'CEO'
```

In [ ]:

```
#dictionary with text keys,text values
user_dict = {'name': 'Nilay',
             'city':'Pune',
             'email':'nilaykarade@gmail.com'}
print(user_dict)
```

```
{'name': 'Nilay', 'city': 'Pune', 'email': 'nilaykarade@gmail.com'}
```

In [ ]:

```
user_dict['name']
```

Out[4]:

```
'Nilay'
```

In [ ]:

```
user_dict['city']
```

Out[8]:

```
'Pune'
```

In [ ]:

```
#adding a new data into a dictionary
user_dict['designation']="AI engg."
user_dict
```

Out[5]:

```
{'name': 'Nilay',
 'city': 'Pune',
 'email': 'nilaykarade@gmail.com',
 'designation': 'AI engg.'}
```

In [ ]:

```
#dictionary with mixed types of  keys and values
user_dict = {'name': 'Nilay',
             'age':20,
             'height':178.8,
             'city':'Pune',
             'email':'nilaykarade@gmail.com'}
print(user_dict)
```

```
{'name': 'Nilay', 'age': 20, 'height': 178.8, 'city': 'Pune', 'email': 'nila
ykarade@gmail.com'}
```

In [ ]:

```
#Task 1
#movie_dict
#student
#course
#task 2
#currency exchange rates
d={'zar-usd':0.05,'zar-inr':4.3}
```

In [ ]:

```
#dictionary with mixed types of  keys and values
user_dict = {'name': 'Nilay',
             'age':20,
             'work_from_home':False,
             'skills':['Data Science','Machine Learning','Deep Learning'],
             'qualification':('Ph D', 'MCA','B Sc'),
             'contact_info':{'address':'Pune','mobile':999999999,
                             'email':'nilaykarade@gmail.com'},
             101:66,
             12.3:99,
             True:"xyz"
            }
print(user_dict)

#model_dic={"name":['LR',"LGR"],"params":[3ppd;kl]}
```

```
{'name': 'Nilay', 'age': 20, 'work_from_home': False, 'skills': ['Data Scien
ce', 'Machine Learning', 'Deep Learning'], 'qualification': ('Ph D', 'MCA',
'B Sc'), 'contact_info': {'address': 'Pune', 'mobile': 999999999, 'email':
'nilaykarade@gmail.com'}, 101: 66, 12.3: 99, True: 'xyz'}
```

In [ ]:

```
user_dict['name']
```

Out[8]:

```
'Nilay'
```

In [ ]:

```
user_dict['skills']
```

Out[10]:

```
['Data Science', 'Machine Learning', 'Deep Learning']
```

In [ ]:

```
user_dict['skills'][1]
```

Out[9]:

```
'Machine Learning'
```

In [ ]:

```
user_dict['qualification']
```

Out[11]:

```
('Ph D', 'MCA', 'B Sc')
```

In [ ]:

```
user_dict['qualification'][0]
```

Out[10]:

```
'Ph D'
```

In [ ]:

```
user_dict['contact_info']
```

Out[12]:

```
{'address': 'Pune', 'email': 'nilaykarade@gmail.com', 'mobile': 999999999}
```

In [ ]:

```
user_dict['contact_info']['email']
```

Out[11]:

```
'nilaykarade@gmail.com'
```

In [ ]:

```
my_dict = dict([("name", 'nilay'), ('height', 178)])    #create a dict with list of tuples
print(my_dict)
```

```
{'name': 'nilay', 'height': 178}
```

In [ ]:

```
user1={'name':'Joy'}
user2={'name':'Amanda'}
```

In [ ]:

```
print(user2)
```

```
{'name': 'Amanda'}
```

In [ ]:

```
lst_users=[user1,user2]
lst_users
```

Out[15]:

```
[{'name': 'Joy'}, {'name': 'Amanda'}]
```

In [ ]:

```
lst_users[1]
```

Out[12]:

```
{'name': 'trupti'}
```

In [ ]:

```
lst_users[1]['name']
```

Out[21]:

```
'trupti'
```

In [ ]:

```
user_dict
```

Out[16]:

```
{101: 66,
 12.3: 99,
 True: 'xyz',
 'age': 20,
 'contact_info': {'address': 'Pune',
  'email': 'nilaykarade@gmail.com',
  'mobile': 999999999},
 'name': 'Nilay',
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'skills': ['Data Science', 'Machine Learning', 'Deep Learning'],
 'work_from_home': False}
```

In [ ]:

```
user_dict.get('age')
```

Out[24]:

```
20
```

In [ ]:

```
user_dict.get('contact_info')
```

Out[27]:

```
{'address': 'Pune', 'mobile': 999999999, 'email': 'nilaykarade@gmail.com'}
```

In [ ]:

```
user_dict.get('contact_info').get('address')
```

Out[25]:

```
'Pune'
```

In [ ]:

```
user_dict.get('contact_info')['address']
```

Out[23]:

```
'Pune'
```

In [ ]:

```
#print other values of user_dict using get()
```

Dict Add or Modify Elements

In [ ]:

```
user_dict
```

Out[29]:

```
{'name': 'Nilay',
 'age': 20,
 'is_willing_to_relocate': False,
 'skills': ['Data Science', 'Machine Learning', 'Deep Learning'],
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'contact_info': {'address': 'Pune',
  'mobile': 999999999,
  'email': 'nilaykarade@gmail.com'},
 101: 66}
```

In [ ]:

```
user_dict['name'] = 'Nilay Karade'
user_dict['age']=35
user_dict
#change age value
```

Out[26]:

```
{'name': 'Nilay Karade',
 'age': 35,
 'is_willing_to_relocate': False,
 'skills': ['Data Science', 'Machine Learning', 'Deep Learning'],
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'contact_info': {'address': 'Pune',
  'mobile': 999999999,
  'email': 'nilaykarade@gmail.com'},
 101: 66}
```

In [ ]:

```
#change value of 'data science' to  'data science  & analytics'
user_dict['skills']
```

Out[27]:

```
['Data Science', 'Machine Learning', 'Deep Learning']
```

In [ ]:

```
user_dict['skills'][0]
```

Out[28]:

```
'Data Science'
```

In [ ]:

```
user_dict['skills'][0]="Data Science & Data Analytics"
user_dict
```

Out[29]:

```
{'name': 'Nilay Karade',
 'age': 35,
 'is_willing_to_relocate': False,
 'skills': ['Data Science & Data Analytics',
  'Machine Learning',
  'Deep Learning'],
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'contact_info': {'address': 'Pune',
  'mobile': 999999999,
  'email': 'nilaykarade@gmail.com'},
 101: 66}
```

In [ ]:

```
user_dict['skills'].append("Artificial Int.")
user_dict
```

Out[30]:

```
{'name': 'Nilay Karade',
 'age': 35,
 'is_willing_to_relocate': False,
 'skills': ['Data Science & Data Analytics',
  'Machine Learning',
  'Deep Learning',
  'Artificial Int.'],
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'contact_info': {'address': 'Pune',
  'mobile': 999999999,
  'email': 'nilaykarade@gmail.com'},
 101: 66}
```

In [ ]:

```
user_dict['contact_info']['mobile'] = 888888888
user_dict
```

Out[17]:

```
{101: 66,
 12.3: 99,
 True: 'xyz',
 'age': 20,
 'contact_info': {'address': 'Pune',
  'email': 'nilaykarade@gmail.com',
  'mobile': 888888888},
 'name': 'Nilay',
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'skills': ['Data Science', 'Machine Learning', 'Deep Learning'],
 'work_from_home': False}
```

In [ ]:

```
# modify age, skills, mobile number
```

Dict Delete or Remove Element

In [ ]:

```
user_dict.pop('age')
user_dict
```

Out[18]:

```
{101: 66,
 12.3: 99,
 True: 'xyz',
 'contact_info': {'address': 'Pune',
  'email': 'nilaykarade@gmail.com',
  'mobile': 888888888},
 'name': 'Nilay',
 'qualification': ('Ph D', 'MCA', 'B Sc'),
 'skills': ['Data Science', 'Machine Learning', 'Deep Learning'],
 'work_from_home': False}
```

In [ ]:

```
#deleting from dictionalry

squares = {1:1, 2: 4, 3: 9, 4: 16, 5: 25}
print(squares)
squares.popitem()
print(squares)
squares.popitem()
print(squares)
squares.popitem()
print(squares)
squares.popitem()
print(squares)
squares.popitem()
print(squares)
```

```
{1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
{1: 1, 2: 4, 3: 9, 4: 16}
{1: 1, 2: 4, 3: 9}
{1: 1, 2: 4}
{1: 1}
{}
```

In [ ]:

```
#error wil occur as no more items are left in the dictionary
squares.popitem()
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
/tmp/ipykernel_4093/264231611.py in <module>
----> 1 squares.popitem()

KeyError: 'popitem(): dictionary is empty'
```

In [ ]:

```
#remove all items
squares = {2: 4, 3: 9, 4: 16, 5: 25}
print(squares)
squares.clear()
print(squares)
```

```
{2: 4, 3: 9, 4: 16, 5: 25}
{}
```

In [ ]:

```
squares = {2: 4, 3: 9, 4: 16, 5: 25}

#delete dictionary itself
del squares

print(squares) #NameError because dict is deleted
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-34-6fac7747ecad> in <module>
      4 del squares
      5
----> 6 print(squares) #NameError because dict is deleted

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

In [ ]:

```
squares = {2:4, 3:9, 4:16, 5:25}
print(squares.items()) #return a new view of the dictionary items (key, value)
```

```
dict_items([(2, 4), (3, 9), (4, 16), (5, 25)])
```

In [ ]:

```
squares = {2:4, 3:9, 4:16, 5:25}
print(squares.keys()) #return a view of the dictionary keys
```

```
dict_keys([2, 3, 4, 5])
```

In [ ]:

```
squares = {2:4, 3:9, 4:16, 5:25}
print(squares.values()) #return a view of the dictionary values
```

```
dict_values([4, 9, 16, 25])
```

In [ ]:

```
dir(squares)
```

Out[48]:

```
['__class__',
 '__contains__',
 '__delattr__',
 '__delitem__',
 '__dir__',
 '__doc__',
 '__eq__',
 '__format__',
 '__ge__',
 '__getattribute__',
 '__getitem__',
 '__gt__',
 '__hash__',
 '__init__',
 '__init_subclass__',
 '__iter__',
 '__le__',
 '__len__',
 '__lt__',
 '__ne__',
 '__new__',
 '__reduce__',
 '__reduce_ex__',
 '__repr__',
 '__reversed__',
 '__setattr__',
 '__setitem__',
 '__sizeof__',
 '__str__',
 '__subclasshook__',
 'clear',
 'copy',
 'fromkeys',
 'get',
 'items',
 'keys',
 'pop',
 'popitem',
 'setdefault',
 'update',
 'values']
```

In [ ]:

```
name="nilay"
dir(name)
```

Out[49]:

```
['__add__',
 '__class__',
 '__contains__',
 '__delattr__',
 '__dir__',
 '__doc__',
 '__eq__',
 '__format__',
 '__ge__',
 '__getattribute__',
 '__getitem__',
 '__getnewargs__',
 '__gt__',
 '__hash__',
 '__init__',
 '__init_subclass__',
 '__iter__',
 '__le__',
 '__len__',
 '__lt__',
 '__mod__',
 '__mul__',
 '__ne__',
 '__new__',
 '__reduce__',
 '__reduce_ex__',
 '__repr__',
 '__rmod__',
 '__rmul__',
 '__setattr__',
 '__sizeof__',
 '__str__',
 '__subclasshook__',
 'capitalize',
 'casefold',
 'center',
 'count',
 'encode',
 'endswith',
 'expandtabs',
 'find',
 'format',
 'format_map',
 'index',
 'isalnum',
 'isalpha',
 'isascii',
 'isdecimal',
 'isdigit',
 'isidentifier',
 'islower',
 'isnumeric',
 'isprintable',
 'isspace',
```

```
 'istitle',
 'isupper',
 'join',
 'ljust',
 'lower',
 'lstrip',
 'maketrans',
 'partition',
 'replace',
 'rfind',
 'rindex',
 'rjust',
 'rpartition',
 'rsplit',
 'rstrip',
 'split',
 'splitlines',
 'startswith',
 'strip',
 'swapcase',
 'title',
 'translate',
 'upper',
 'zfill']
```