In [ ]:

```
Dictionary

Dictionaries are used to store data values in key:value pairs.

A dictionary is a collection which is ordered*, changeable and does not allow duplicates.

As of Python version 3.7, dictionaries are ordered. In Python 3.6 and earlier, dictionaries

Dictionaries are written with curly brackets, and have keys and values:

Dictionary Items

Dictionary items are ordered, changeable, and does not allow duplicates.

Dictionary items are presented in key:value pairs, and can be referred to by using the key

Ordered or Unordered?

As of Python version 3.7, dictionaries are ordered. In Python 3.6 and earlier, dictionaries

When we say that dictionaries are ordered, it means that the items have a defined order, an

Unordered means that the items does not have a defined order, you cannot refer to an item b

Changeable

Dictionaries are changeable, meaning that we can change, add or remove items after the dict

Duplicates Not Allowed

Dictionaries cannot have two items with the same key:
```

In [ ]:

```
Dictionary Methods

Python has a set of built-in methods that you can use on dictionaries.

Method  Description
clear() Removes all the elements from the dictionary
copy()  Returns a copy of the dictionary
fromkeys()  Returns a dictionary with the specified keys and value
get()   Returns the value of the specified key
items() Returns a list containing a tuple for each key value pair
keys()  Returns a list containing the dictionary's keys
pop()   Removes the element with the specified key
popitem()   Removes the last inserted key-value pair
setdefault()    Returns the value of the specified key. If the key does not exist: insert t
with the specified value
update()    Updates the dictionary with the specified key-value pairs
values()    Returns a list of all the values in the dictionary
```

In [1]:

```python
thisdict ={
  "brand": "Ford",
  "model": "Mustang",
  "year": [1964,2020,2021,2021]
}
print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': [1964, 2020, 2021, 2021]}

In [1]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
print(thisdict["year"])
```

1964

In [3]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964,
  "year": 2020
}
print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': 2020}

In [1]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964,
  "year": 2020
}
print(len(thisdict))
print(thisdict["year"])
```

3
2020

In [5]:

```python
thisdict = {
  "brand": "Ford",
  "electric": False,
  "year": 1964,
  "colors": ["red", "white", "blue"]
}

print(thisdict)
```

```
{'brand': 'Ford', 'electric': False, 'year': 1964, 'colors': ['red', 'whit
e', 'blue']}
```

In [6]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
print(type(thisdict))
```

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

In [4]:

```python
thisdict ={
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
x = thisdict["model"]
print(x)
```

```
Mustang
```

In [8]:

```python
thisdict ={
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
x = thisdict.get("model")
print(x)
```

```
Mustang
```

In [11]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

x = thisdict.keys()

print(x)
```

```
dict_keys(['brand', 'model', 'year'])
```

In [10]:

```python
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}

x = car.keys()

print(x) #before the change

car["color"] = "white"

print(x) #after the change
print(car.values(),car.keys())
```

```
dict_keys(['brand', 'model', 'year'])
dict_keys(['brand', 'model', 'year', 'color'])
dict_values(['Ford', 'Mustang', 1964, 'white']) dict_keys(['brand', 'model',
 'year', 'color'])
```

In [9]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

x = thisdict.values()

print(x)
```

```
dict_values(['Ford', 'Mustang', 1964])
```

In [15]:

```python
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}

x = car.values()

print(x) #before the change

car["year"] = 2020

print(x)
print(car.keys()) #after the change
```

```
dict_values(['Ford', 'Mustang', 1964])
dict_values(['Ford', 'Mustang', 2020])
dict_keys(['brand', 'model', 'year'])
```

In [16]:

```python
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}

x = car.keys()

print(x) #before the change

car["color"] = "red"

print(x) #after the change
```

```
dict_keys(['brand', 'model', 'year'])
dict_keys(['brand', 'model', 'year', 'color'])
```

In [15]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

x = thisdict.items()

print(x)
```

```
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 1964)])
```

In [18]:

```python
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}

x = car.items()

print(x) #before the change

car["year"] = 2020


print(x) #after the change
```

```
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 1964)])
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 2020)])
```

In [17]:

```python
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}

x = car.items()

print(x) #before the change

car["color"] = "red"

print(x) #after the change
```

```
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 1964)])
dict_items([('brand', 'Ford'), ('model', 'Mustang'), ('year', 1964), ('colo
r', 'red')])
```

In [18]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
if "model" in thisdict:
  print("Yes, 'model' is one of the keys in the thisdict dictionary")
```

```
Yes, 'model' is one of the keys in the thisdict dictionary
```

In [19]:

```python
thisdict =  {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}

thisdict["year"] = 2018

print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': 2018}

In [20]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.update({"year": 2020})

print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': 2020}

In [21]:

```python
child1 = {
  "name" : "Emil",
  "year" : 2004
}
child2 = {
  "name" : "Tobias",
  "year" : 2007
}
child3 = {
  "name" : "Linus",
  "year" : 2011
}

myfamily = {
  "child1" : child1,
  "child2" : child2,
  "child3" : child3
}

print(myfamily)
```

{'child1': {'name': 'Emil', 'year': 2004}, 'child2': {'name': 'Tobias', 'yea
r': 2007}, 'child3': {'name': 'Linus', 'year': 2011}}

In [22]:

```python
myfamily = {
  "child1" : {
    "name" : "Emil",
    "year" : 2004
  },
  "child2" : {
    "name" : "Tobias",
    "year" : 2007
  },
  "child3" : {
    "name" : "Linus",
    "year" : 2011
  }
}

print(myfamily)
```

```
{'child1': {'name': 'Emil', 'year': 2004}, 'child2': {'name': 'Tobias', 'yea
r': 2007}, 'child3': {'name': 'Linus', 'year': 2011}}
```

In [23]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
mydict = dict(thisdict)
print(mydict)
```

```
{'brand': 'Ford', 'model': 'Mustang', 'year': 1964}
```

In [24]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
mydict = thisdict.copy()
print(mydict)
```

```
{'brand': 'Ford', 'model': 'Mustang', 'year': 1964}
```

In [25]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
for x, y in thisdict.items():
  print(x, y)
```

```
brand Ford
model Mustang
year 1964
```

In [26]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
for x in thisdict.keys():
  print(x)
```

```
brand
model
year
```

In [27]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
for x in thisdict.values():
  print(x)
```

```
Ford
Mustang
1964
```

In [28]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
for x in thisdict:
  print(thisdict[x])
```

```
Ford
Mustang
1964
```

In [29]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
del thisdict
print(thisdict) #this will cause an error because "thisdict" no longer exists.
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-29-539e3802548a> in <module>
      5 }
      6 del thisdict
----> 7 print(thisdict) #this will cause an error because "thisdict" no long
er exists.

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

In [30]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.clear()
print(thisdict)
```

```
{}
```

In [31]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
del thisdict["model"]
print(thisdict)
```

```
{'brand': 'Ford', 'year': 1964}
```

In [32]:

```python
thisdict =  {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.popitem()
print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang'}

In [33]:

```python
thisdict =  {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.pop("model")
print(thisdict)
```

{'brand': 'Ford', 'year': 1964}

In [34]:

```python
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict.update({"color": "red"})

print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': 1964, 'color': 'red'}

In [35]:

```python
thisdict =  {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict["color"] = "red"
print(thisdict)
```

{'brand': 'Ford', 'model': 'Mustang', 'year': 1964, 'color': 'red'}