Python Dictionaries

Dictionary

A dictionary is a collection which is unordered, changeable and indexed. In Python dictionaries are written with **curly brackets**, and they have **keys and values pair**.

Example

Create and print a dictionary:

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

Accessing Items

You can access the items of a dictionary by referring to its key name, inside square brackets:

Example

Get the value of the "model" key:

```
x = thisdict["model"]
```

There is also a method called **get()** that will give you the same result:

Example

Get the value of the "model" key:

```
x = thisdict.get("model")
```

Change Values

You can change the value of a specific item by referring to its key name:

Example

Change the "year" to 2018:

```
thisdict = {
  "brand": "Ford",
  "model": "Mustang",
  "year": 1964
}
thisdict["year"] = 2018
```

Loop Through a Dictionary

You can loop through a dictionary by using a for loop.

When looping through a dictionary, the return value are the *keys* of the dictionary, but there are methods to return the *values* as well.

Example

Print all key names in the dictionary, one by one:

```
for x in thisdict:
  print(x)
```

Print all *values* in the dictionary, one by one:

```
for x in thisdict:
  print(thisdict[x])
```

Continued

You can also use the values() function to return values of a dictionary:

```
for x in thisdict.values():
  print(x)
```

Loop through both *keys* and *values*, by using the items() function:

```
for x, y in thisdict.items():
  print(x, y)
```

Check if Key Exists

To determine if a specified key is present in a dictionary use the in keyword:

Example

Check if "model" is present in the dictionary:

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

Dictionary Length

To determine how many items (key-value pairs) a dictionary has, use the len() method.

Example

Print the number of items in the dictionary:

```
print(len(thisdict))
```

Adding Items

Adding an item to the dictionary is done by using a new index key and assigning a value to it:

Example

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

Removing Items

There are several methods to remove items from a dictionary:

Example

The **pop()** method removes the item with the specified key name:

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

The popitem() method removes the last inserted item (in versions before 3.7, a random item is removed instead):

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

The **del** keyword removes the item with the specified key name:

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

The del keyword can also delete the dictionary completely:

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

The clear() keyword empties the dictionary:

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

Copy a Dictionary

You cannot copy a dictionary simply by typing dict2 = dict1, because: dict2 will only be a *reference* to dict1, and changes made in dict1 will automatically also be made in dict2.

There are ways to make a copy, one way is to use the built-in Dictionary method copy().

Example

Make a copy of a dictionary with the copy() method:

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

Another way to make a copy is to use the built-in method dict().

Example

Make a copy of a dictionary with the dict() method:

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

Nested Dictionaries

A dictionary can also contain many dictionaries, this is called nested dictionaries.

Example

Create a dictionary that contain three dictionaries:

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

Create three dictionaries, than create one dictionary that will contain the other three dictionaries:

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

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

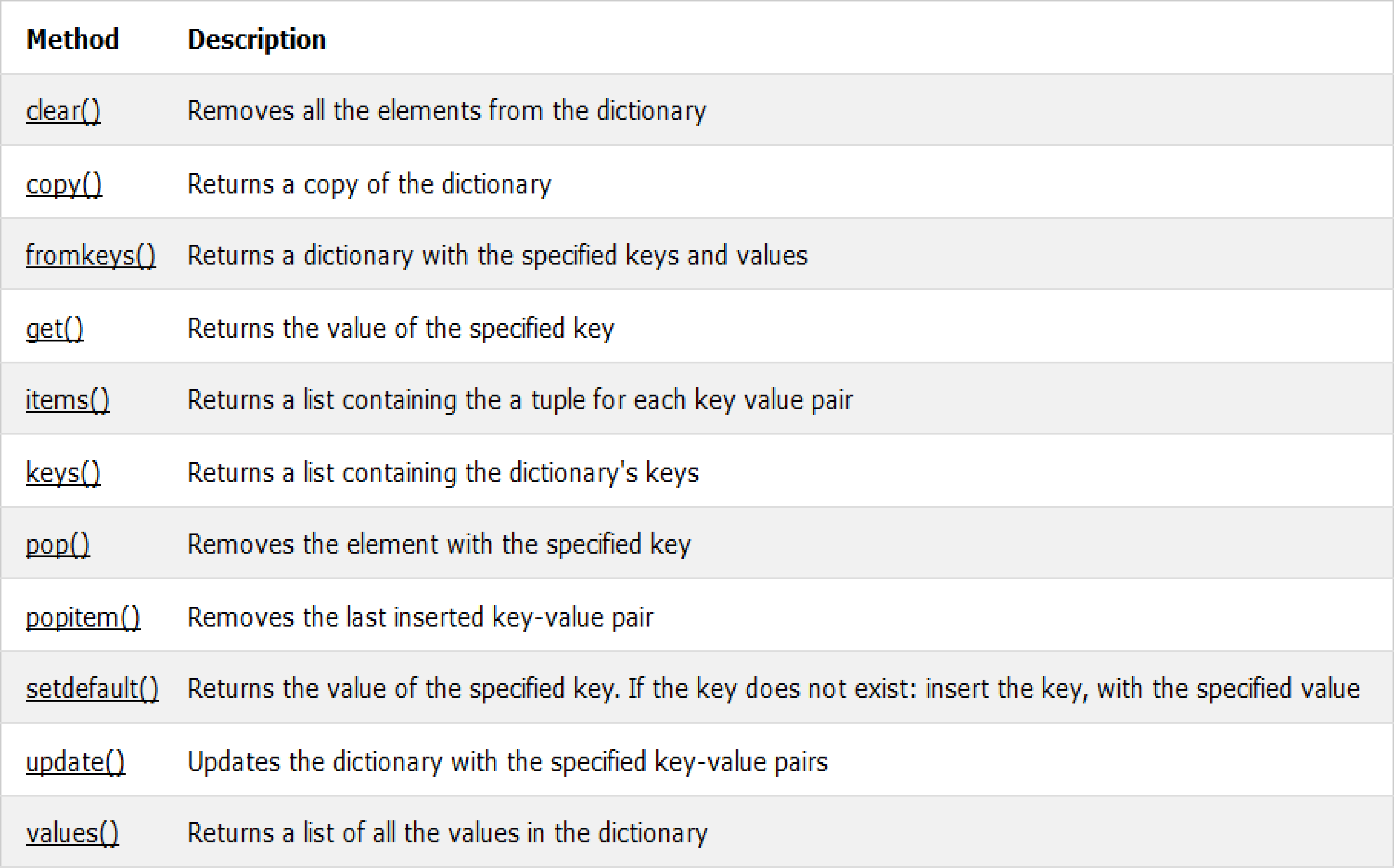
The dict() Constructor

It is also possible to use the dict() constructor to make a new dictionary:

Example

```
thisdict = dict(brand="Ford", model="Mustang",
year=1964)
# note that keywords are not string literals
# note the use of equals rather than colon for the
assignment
print(thisdict)
```

Dictionary Methods



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 values
get()	Returns the value of the specified key
items()	Returns a list containing the 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 the key, 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