Python From Scratch
Python Dictionaries

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Python Dictionaries

Dictionary Items

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

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

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

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

Example

Create and print a dictionary:

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

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 name.

Example

Print the "brand" value of the dictionary:

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

Ordered or Unordered?

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

When we say that dictionaries are ordered, it means that the items have a defined order, and that order will not change.

Unordered means that the items does not have a defined order, you cannot refer to an item by using an index.

Changeable

Dictionaries are changeable, meaning that we can change, add or remove items after the dictionary has been created.

Duplicates Not Allowed

Dictionaries cannot have two items with the same key:

Example

Duplicate values will overwrite existing values:

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

Python - Access Dictionary Items

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:

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

Get Keys

The keys() method will return a list of all the keys in the dictionary.

Example

Get a list of the keys:

```
x = thisdict.keys()
```

The list of the keys is a view of the dictionary, meaning that any changes done to the dictionary will be reflected in the keys list.

Example

Add a new item to the original dictionary, and see that the keys list gets updated as well:

```
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}
x = car.keys()
print(x) #before the change
car["color"] = "white"
print(x) #after the change
```

Get Values

The values() method will return a list of all the values in the dictionary.

Example

Get a list of the values:

```
x = thisdict.values()
```

The list of the values is a *view* of the dictionary, meaning that any changes done to the dictionary will be reflected in the values list.

Example

Make a change in the original dictionary, and see that the values list gets updated as well:

```
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}
x = car.values()
print(x) #before the change
car["year"] = 2020
print(x) #after the change
```

Example

Add a new item to the original dictionary, and see that the values list gets updated as well:

```
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}
x = car.values()
print(x) #before the change
car["color"] = "red"
print(x) #after the change
```

Get Items

The items() method will return each item in a dictionary, as tuples in a list.

Example

Get a list of the key:value pairs

```
x = thisdict.items()
```

The returned list is a view of the items of the dictionary, meaning that any changes done to the dictionary will be reflected in the items list.

Example

Make a change in the original dictionary, and see that the items list gets updated as well:

```
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}
x = car.items()
print(x) #before the change
car["year"] = 2020
print(x) #after the change
```

Example

Add a new item to the original dictionary, and see that the items list gets updated as well:

```
car = {
"brand": "Ford",
"model": "Mustang",
"year": 1964
}
x = car.items()
print(x) #before the change
car["color"] = "red"
print(x) #after the change
```

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")
```

Python - Change Dictionary Items

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
```

Update Dictionary

The update() method will update the dictionary with the items from the given argument.

The argument must be a dictionary, or an iterable object with key:value pairs.

Example

Update the "year" of the car by using the update() method:

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

Python - Add Dictionary Items

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)
```

Update Dictionary

The update() method will update the dictionary with the items from a given argument. If the item does not exist, the item will be added.

The argument must be a dictionary, or an iterable object with key:value pairs.

Example

Add a color item to the dictionary by using the update() method:

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

Python - Remove Dictionary Items

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)
```

Example

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)
```

Example

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

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

Example

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.
```

Example

The clear() method empties the dictionary:

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