Python Dictionaries

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

## **Dictionary**

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.

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?**

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)

## **Dictionary Length**

To determine how many items a dictionary has, use the len() function:

### **Example**

Print the number of items in the dictionary:

print(len(thisdict))

## **Dictionary Items - Data Types**

The values in dictionary items can be of any data type:

### **Example**

String, int, boolean, and list data types:

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

## **type()**

From Python's perspective, dictionaries are defined as objects with the data type 'dict':

<class 'dict'>

### **Example**

Print the data type of a dictionary:

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

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

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## **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()

## **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()

## **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})

## **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"})

## **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.

## **Dictionary Methods**

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

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 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