



IBM Developer SKILLS NETWORK

Dictionaries in Python

Estimated time needed: 25 minutes

Objectives

After completing this lab you will be able to:

- Work with and perform operations on dictionaries in Python

Table of Contents

- Dictionaries
 - What are Dictionaries?
 - Keys
- Quiz on Dictionaries

Dictionaries

What are Dictionaries?

A dictionary consists of keys and values. It is helpful to compare a dictionary to a list. Instead of being indexed numerically like a list, dictionaries have keys. These keys are the keys that are used to access values within a dictionary.



An example of a Dictionary Dict:

```
In [1]: # Create the dictionary
Dict = {"key1": 1, "key2": "2", "key3": [3, 3, 3], "key4": (4, 4, 4), ('key5'): 5, (0, 1): 6}
```

```
Out[1]: {'key1': 1,
'key2': '2',
'key3': [3, 3, 3],
'key4': (4, 4, 4),
'key5': 5,
(0, 1): 6}
```

The keys can be strings:

```
In [2]: # Access to the value by the key
Dict["key1"]
```

```
Out[2]: 1
```

Keys can also be any immutable object such as a tuple:

```
In [3]: # Access to the value by the key
Dict[(0, 1)]
```

```
Out[3]: 6
```

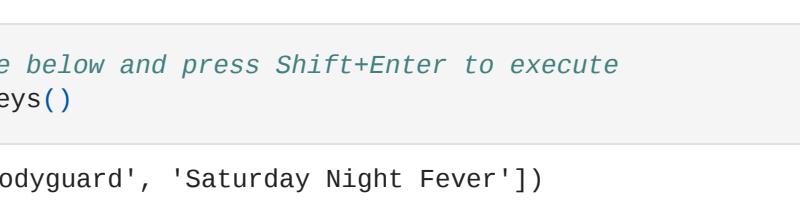
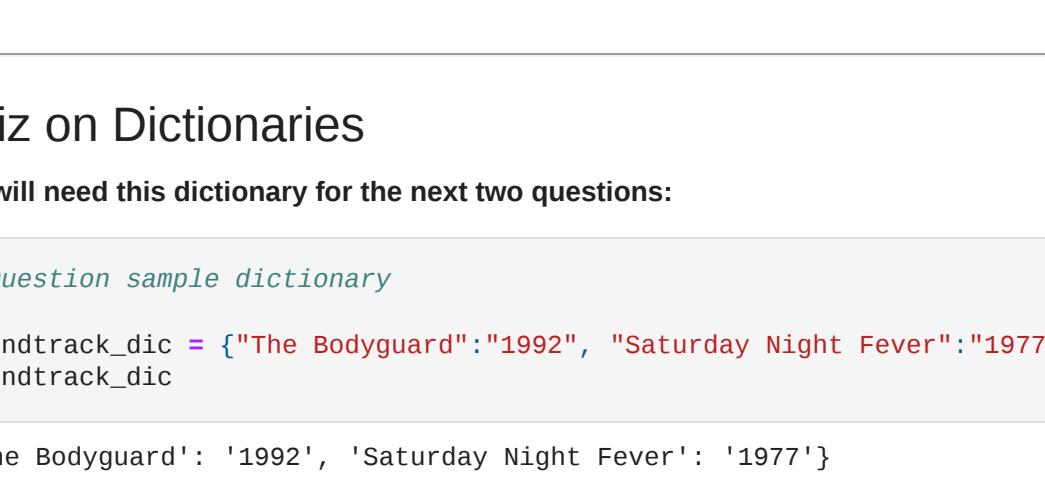
Each key is separated from its value by a colon ":". Commas separate the items, and the whole dictionary is enclosed in curly braces. An empty dictionary without any items is written with just two curly braces, like this "{}".

```
In [4]: # Create a sample dictionary
release_year_dict = {"Thriller": "1982", "Back in Black": "1980", \
                     "The Dark Side of the Moon": "1973", "The Bodyguard": "1992", \
                     "Bat Out of Hell": "1977", "Their Greatest Hits (1971-1975)": "1976", \
                     "Saturday Night Fever": "1977", "Rumours": "1977"}
```

```
Out[4]: {'Thriller': '1982',
'Back in Black': '1980',
'The Dark Side of the Moon': '1973',
'The Bodyguard': '1992',
'Bat Out of Hell': '1977',
'Their Greatest Hits (1971-1975)': '1976',
'Saturday Night Fever': '1977',
'Rumours': '1977'}
```

In summary, like a list, a dictionary holds a sequence of elements. Each element is represented by a key and its corresponding value. Dictionaries are created with two curly braces containing keys and values separated by a colon. For every key, there can only be one single value, however, multiple keys can hold the same value. Keys can only be strings, numbers, or tuples, but values can be any data type.

It is helpful to visualize the dictionary as a table, as in the following image. The first column represents the keys, the second column represents the values.



Keys

You can retrieve the values based on the names:

```
In [5]: # Get value by keys
release_year_dict['Thriller']
```

```
Out[5]: '1982'
```

This corresponds to:

"Thriller"	"1982"
"Back in Black"	"1980"
"The Dark Side of the Moon"	"1973"
"The Bodyguard"	"1992"
"Bat Out of Hell"	"1977"
"Their Greatest..."	"1976"
"Saturday Night Fever"	"1977"
"Rumours"	"1977"

Similarly for The Bodyguard

```
In [6]: # Get value by key
release_year_dict['The Bodyguard']
```

```
Out[6]: '1992'
```

"Thriller"	"1982"
"Back in Black"	"1980"
"The Dark Side of the Moon"	"1973"
"The Bodyguard"	"1992"
"Bat Out of Hell"	"1977"
"Their Greatest..."	"1976"
"Saturday Night Fever"	"1977"
"Rumours"	"1977"

Now let us retrieve the keys of the dictionary using the method `keys()`:

```
In [7]: # Get all the keys in dictionary
release_year_dict.keys()
```

```
Out[4]: dict_keys(['Thriller', 'Back in Black', 'The Dark Side of the Moon', 'The Bodyguard', 'Bat Out of Hell', 'Their Greatest Hits (1971-1975)', 'Saturday Night Fever', 'Rumours'])
```

You can retrieve the values using the method `values()`:

```
In [8]: # Get all the values in dictionary
release_year_dict.values()
```

```
Out[8]: dict_values(['1982', '1980', '1973', '1992', '1977', '1976', '1977', '1977'])
```

We can add an entry:

```
In [9]: # Append value with key into dictionary
release_year_dict['Graduation'] = '2007'
```

```
Out[9]: {'Thriller': '1982',
'Back in Black': '1980',
'The Dark Side of the Moon': '1973',
'The Bodyguard': '1992',
'Bat Out of Hell': '1977',
'Their Greatest Hits (1971-1975)': '1976',
'Saturday Night Fever': '1977',
'Rumours': '1977',
'Graduation': '2007'}
```

We can delete an entry:

```
In [10]: # Delete entries by key
del(release_year_dict['Thriller'])
del(release_year_dict['Graduation'])
```

```
Out[10]: {'Back in Black': '1980',
'The Dark Side of the Moon': '1973',
'The Bodyguard': '1992',
'Bat Out of Hell': '1977',
'Their Greatest Hits (1971-1975)': '1976',
'Saturday Night Fever': '1977',
'Rumours': '1977'}
```

We can verify if an element is in the dictionary:

```
In [11]: # Verify the key is in the dictionary
'The Bodyguard' in release_year_dict
```

```
Out[11]: True
```

Quiz on Dictionaries

You will need this dictionary for the next two questions:

```
In [12]: # Question sample dictionary
soundtrack_dic = {"The Bodyguard": "1992", "Saturday Night Fever": "1977"}
```

```
Out[12]: {'The Bodyguard': '1992', 'Saturday Night Fever': '1977'}
```

a) In the dictionary `soundtrack_dic` what are the keys?

```
In [13]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[13]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

b) In the dictionary `soundtrack_dic` what are the values?

```
In [14]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[14]: dict_values(['1992', '1977'])
```

c) Click here for the solution

c) Find the names of the albums from the dictionary using the method `keys()`:

```
In [15]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[15]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

d) Click here for the solution

d) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [16]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[16]: dict_values(['1992', '1977'])
```

e) Click here for the solution

f) Find the names of the albums from the dictionary using the method `keys()`:

```
In [17]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[17]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

g) Click here for the solution

h) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [18]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[18]: dict_values(['1992', '1977'])
```

i) Click here for the solution

j) Find the names of the albums from the dictionary using the method `keys()`:

```
In [19]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[19]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

k) Click here for the solution

l) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [20]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[20]: dict_values(['1992', '1977'])
```

m) Click here for the solution

n) Find the names of the albums from the dictionary using the method `keys()`:

```
In [21]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[21]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

o) Click here for the solution

p) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [22]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[22]: dict_values(['1992', '1977'])
```

q) Click here for the solution

r) Find the names of the albums from the dictionary using the method `keys()`:

```
In [23]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[23]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

s) Click here for the solution

t) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [24]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[24]: dict_values(['1992', '1977'])
```

u) Click here for the solution

v) Find the names of the albums from the dictionary using the method `keys()`:

```
In [25]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[25]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

w) Click here for the solution

x) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [26]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[26]: dict_values(['1992', '1977'])
```

y) Click here for the solution

z) Find the names of the albums from the dictionary using the method `keys()`:

```
In [27]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[27]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

aa) Click here for the solution

ab) Find the values of the recording sales from the dictionary using the method `values()`:

```
In [28]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.values()
```

```
Out[28]: dict_values(['1992', '1977'])
```

ac) Click here for the solution

ad) Find the names of the albums from the dictionary using the method `keys()`:

```
In [29]: # Write your code below and press Shift+Enter to execute
soundtrack_dic.keys()
```

```
Out[29]: dict_keys(['The Bodyguard', 'Saturday Night Fever'])
```

ae) Click here for the solution

af) Find the values of the recording sales from the dictionary using the method `values()`:</