

Programming fundamentals with Python

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Plan for today

Learn about dictionaries

Do some exercises with dictionaries

Talk about algorithms

Dictionaries

Dictionaries are data structures that map keys to values

Dictionaries: Syntax

```
my_dictionary = {  
    "key": "value"  
}
```

Dictionaries: Syntax

```
empty_dictionary = {}
```

One can create an empty dictionary by using opening and closing curly brackets

Dictionaries: Syntax

```
members = {  
    "The Ramones": 4,  
    "The Beatles": 4,  
    "Straycats": 3  
}
```

Or you can create a dictionary and add key-value pairs to it directly:

Dictionaries: Syntax

Adding new elements to a dictionary

As with lists, you can use the following syntax:

```
in_english = {}  
  
in_english[33] = "thirty three"  
in_english[5] = "five"
```

Adding new elements to a dictionary

Deleting elements from a dictionary

As with lists, you can use the pop method!

```
in_english = {}  
  
in_english[33] = "thorty three"  
in_english.pop(33)  
in_english[33] = "thirty three"
```

Deleting elements from a dictionary

Looping dictionaries

As with lists, the easiest way of looping over all elements in a dictionary is a for loop:

```
ingredients = {  
    "potatoes": 3,  
    "celery": 1,  
    "onion": 1  
}  
  
for key in ingredients:  
    print("I have " + ingredients[key] + " " + key)
```

Looping dictionaries

There are lots of useful things that we can do with dictionaries:

```
dictionary.keys() # returns all keys as a list  
dictionary.values() # returns all values as a list  
len(dictionary) # returns the number of elements in a dictionary  
key in dictionary # returns true if the dictionary contains the key  
key not in dictionary # returns true if the dictionary does not  
                        # contain the key  
# and much more :)
```


- 1 Create a function that receives a text and returns the frequency of each word in the text (as a dictionary).

Exercises

- 2 Create a function that uses the previously generated dictionary and prints a bars diagram of the frequencies. For example, the following:

```
dictionary = {"a": 4, "hello": 1, "world": 3, "another": 2}  
diagram(dictionary)
```

should print:

```
a          | ****  
hello      | *  
world      | ***  
another    | **
```

- 3 re-implement the phonebook example using a dictionary instead of two lists.