Programming fundamentals with Python

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Programming fundamentals with Python

https://slides.com/pepegar/pfp-3/live

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

Miscelanea

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 :)
```

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Exercises

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

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

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

   should print:

   ```
   #+BEGIN_SRC
   a       | ****
   ```