Python Programming: Dictionaries

Learning Objectives

After this lesson, you will be able to:

- Perform common dictionary actions.
- Build more complex dictionaries.

Kicking Off Unit 3

In Unit 2, we ended by changing what our movie app printed depending on the value of a variable.

Unit 3 is about **objects** in programming.

- Objects are different kinds of things variables can hold.
- Objects help give our programs more structure and functionality.
- You already have one object down! Lists are an object with built-in functionality like `append()` and `pop()`.

In Unit 3, we're going to add many more objects. By the end, your movie app will have the same functionality, but it will be structured in a totally different way.

Ready? Let's go!

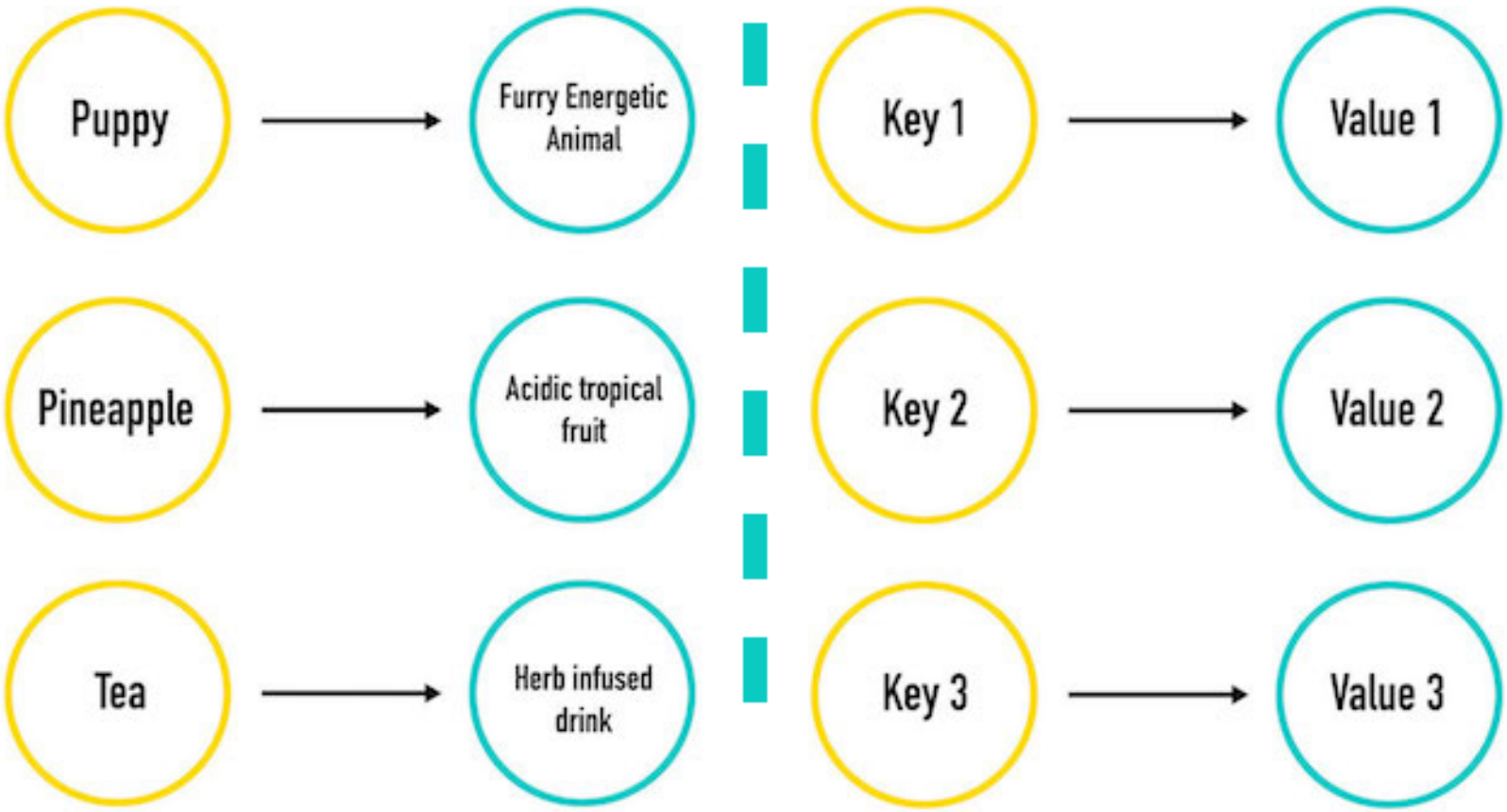
Introducing Dictionaries

Think about dictionaries — they're filled with words and definitions that are paired together.

Programming has a dictionary object just like this!

- Dictionaries hold keys (words) and values (the definitions).
- In a real dictionary, you can look up a word and find the definition. In a Python dictionary, you can look up a key and find the value.

Introducing Dictionaries



Declaring a Dictionary

Dictionaries in programming are made of **key-value pairs**.

```
# Here's the syntax:

name_of_dictionary = {"Key1": "Value", "Key2": "Value", "Key3": "Value"}

print(name_of_dictionary[key_to_look_up])

# Prints the value


# And in action...

my_dictionary = {"Puppy": "Furry, energetic animal", "Pineapple": "Acidic tr


print(my_dictionary)

# Prints the whole dictionary

print(my_dictionary["Puppy"])
```

run ▶

Not sure what to do? Run some examples (start typing to dismiss)

```
Python 3.6.1 (default, Dec 2015, 13:05:11)
[GCC 4.8.2] on linux
>
```

run ▶

```
Python 3.6.1 (default, Dec 2015, 13:05:11)
[GCC 4.8.2] on linux
>
```

Quick Review: Dictionaries

We can:

- Make a dictionary.
- Print a dictionary.
- Print one key's value.
- Change a key's value.

Here's a best practice: Declare your dictionary across multiple lines for readability. Which is better?

```
# This works but is not proper style.
my_dictionary = {"Puppy": "Furry, energetic animal", "Pineapple": "Acidic tr


# Do this instead!
my_dictionary = {
  "Puppy": "Furry, energetic animal",
  "Pineapple": "Acidic tropical fruit",
  "Tea": "Herb-infused drink"
}
```

Discussion: Collection Identification Practice

What are `a` and `b` below?:

```
# What object is this?


collection_1 = [3, 5, 7, "nine"]


# What object is this?
collection_2 = {"three": 3, "five": 5, 9: "nine"}
```

run ▶

```
Python 3.6.1 (default, Dec 2015, 13:05:11)
[GCC 4.8.2] on linux
>
```

Partner Exercise: Dictionary Practice

You know the drill: Grab a partner and pick a driver!

Create a new local file, `dictionary_practice.py`. Write a script that declares a dictionary called `my_name`.

- Add a key for each letter in your name with a value of how many times that letter appears.

As an example, here is the dictionary you'd make for `"Callee"`:

```
my_name = {"c": 1, "a": 1, "l": 2, "e": 2}
```

Write a loop that prints the dictionary, but formatted.

```
# The letter l appears in my name 2 times.
```

Bonus (if you have time): If it's only one time, instead print `The letter l appears in my name once`. If it's only two times, instead print `The letter l appears in my name twice`.

Partner Exercise: Most Popular Word

With the same partner, switch who's driving.

Write a function, `mostPopularWord()`, that takes a list of strings and returns the string that appears the most.

For example:

```
words = [
    "hello",
    "water",
    "hello"
  ]


print(mostPopularWord(words))
# Prints "hello"
```

Hints:

- Create a dictionary with words as keys and the count as the values.
- Check if a key already exists with `if "key_to_check" in my_dictionary:`.

run ▶

```
Python 3.6.1 (default, Dec 2015, 13:05:11)
[GCC 4.8.2] on linux
>
```

Summary and Q&A

Dictionaries:

- Are another kind of collection, instead of a list.
- Use **keys** to access **values**, not indices!
- Should be used instead of lists when:
  - You don't care about the order of the items.
  - You'd prefer more meaningful keys than just index numbers.

```
my_dictionary = {
  "Puppy": "Furry, energetic animal",
  "Pineapple": "Acidic tropical fruit",
  "Tea": "Herb-infused drink"
}
```

You Do: Reverse Lookup

Finding the value from a key is easy: `my_dictionary[key]`. But, what if you only have the value and want to find the key?

You task is to write a function, `reverse_lookup()`, that takes a dictionary and a value and returns the corresponding key.

For example:

```
state_capitals = {
  "Alaska" : "Juneau",
  "Colorado" : "Denver",
  "Oregon" : "Salem",
  "Texas" : "Austin"
  }


print(reverse_lookup("Denver"))
# Prints Colorado
```