Nested Dictionaries & Lists

Learning Objectives:

- Students will accurately predict the output of statements accessing values in nested dictionaries and lists.

Video Demo

Nesting

Nesting is also allowed in dictionaries. In other words, dictionaries may contain lists and tuples as well as other dictionaries. Likewise, lists may contain dictionaries. All of these may be many levels deep! In this module you'll become more familiar with how to manipulate nested lists and dictionaries.

```
# List of dictionaries
users = [
    {"first": "Ada", "last": "Lovelace"}, # index 0
    {"first": "Alan", "last": "Turing"}, # index 1
    {"first": "Eric", "last": "Idle"} # index 2
]
# Dictionary of lists
resume_data = {
    #                0          1          2
    "skills": ["front-end", "back-end", "database"],
    #                0          1
    "languages": ["Python", "JavaScript"],
    #                0             1
    "hobbies":["rock climbing", "knitting"]
}
```

Accessing Values in Nested Dictionaries

To access a value in a nested data structure take a look at how you would access the first user's last name.

```
print(users[0]["last"]) # prints Lovelace
```

Let's break this down a bit.

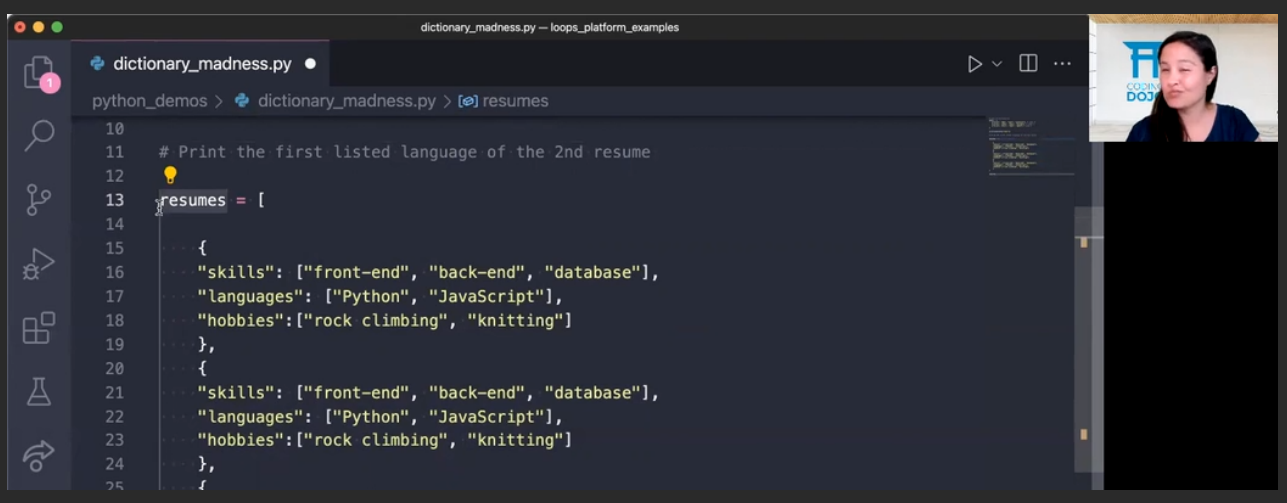
First, `users[0]` is the whole user dictionary stored at index 0. Next, you find the value stored at the key `"last"` where we finally get the raw value, `"Lovelace"`.

Ninja Challenge: On your own, predict what values would print for the following lines of code *without* running it. Feel free to make a diagram on paper or a white board the way we did above. Want to check your answer? Run the code in your terminal. Don't forget to copy the dictionaries too! :D

```
print(resume_data["skills"][1])
print(users[2]["first"])
```

Tip: *Pay very close attention to which kind of brackets you're looking at in the nested structure. If it starts with `{`, it's the start of a dictionary and you'll need a key, to access something one level further into it. If it starts with `[`, it's a list, and you'll need an index to go one level further into it.*

Multi-level Nesting



Previous

Next