

Working with Data: Intro to Web APIs

JavaScript + Internet Data

Announcements: Schedule

Week 14 (this Week)

- We, 4/12: [HW6](#) due **TONIGHT. Extended office hours (3:30-5:30)**
- Fr, 4/14: Class Cancelled, no Tutorial, work on your final projects

Week 15

- Mo, 4/17: Mid-point project deliverable due
- We, 4/19: Mid-point project presentations during class

Week 16

- Mo, 4/24: Quiz 3
- We, 4/26: [HW7](#) due (Spotify Interface)
- Fri, 4/28: Final exam Section 2

Week 17

- Mo, 5/1: Final exam Section 1
- Tu, 5/2: Final Project due

Outline

1. How do modern web applications work?
2. What is a Web API or REST API?
3. Let's practice using these new data structures!

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1. How do modern web applications work?

Modern web applications are **dynamic**.

- The content and the form of a web page change on-the-fly as new interactions happen
- These interfaces are build from JSON data.
 - JSON stands for **JavaScript Object Notation**, and it's a common format for transmitting and storing data

1. How do modern web applications work?

Let's examine and deconstruct some websites...

- [Spotify](#)
- [ART Bus System](#)
- [Courses at UNCA](#)
- [Sarah made this one :\)](#)

Outline

1. How do modern web applications work?
- 2. What is a Web API or REST API?**
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2. Where does this data come from?

- Many organizations make data available using something called a “REST API,” or a “Web API”
 - API is an acronym for “Application Programming Interface”. This is basically a set of rules that you have to follow to interact with the organization’s database over the web.
- A Web APIs gives other applications access to a subset of an organization’s data.
- This means that anyone could build an interface to Spotify or Yelp, etc.
- **Side Note:** In CSCI 344, we will build a [Web API](#), and then build a [client](#) to interact with this API. Professor Bogert also teaches a databases class (CSCI 343) where you learn how to design, build, and interact with databases.

Accessing a Web API

- In order to use a Web API, you typically need to register with the API provider and obtain an access token (which is typically kept secret).
- This enables the provider to track who is using their API and for what purposes. Platforms might also charge for their data services (i.e. Google), so people's bank accounts are often tied to their API key
- Often times, a proxy server is used to embed an API key in a fetch request (more on that in a moment).

Practice with technical documentation...

Let's practice looking at technical documentation...

- Spotify's [Web API Documentation](#)
- Let's interact with this Web API using a web tool called [Postman](#)
 - I'm going to use my account, but you're welcome to register for an account if you want!
- Note that I'm getting an authentication error.
 - Because of this, I have created a proxy server to simplify the process...

Using a **Proxy Server**

Proxy servers are used in a variety of contexts:

1. To obscure the address of the server you're actually accessing (e.g., in countries that restrict access to certain websites).
2. To provide some intermediate functionality as you're interacting with a server. In the case of the API Tutor proxy server (which is an educational tool that Sarah made for some of her courses):
 - a. It's adding a secret key to the header of the request before forwarding the request onto its destination, and
 - b. It's simplifying some the data that's returned by the server so that it's easier for novices to parse and understand.

Using a Proxy Server → **API Tutor**

1. Issues search query to API Tutor for the Yelp endpoint with query string appended:

?location=Evanston,IL

Your App

2. Appends authorization header with Sarah's API key...
{header with secret_token}
...and then forwards the request to the YELP API

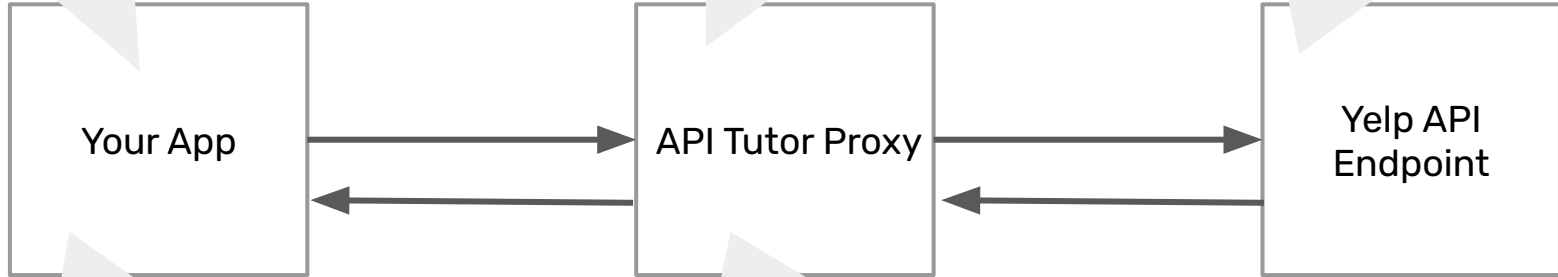
API Tutor Proxy

3. Yelp returns data that matches the query
{ results: [{name: 'Kabul House', id: 4572121, address: '1234 Main St...'}]}

Yelp API Endpoint

5. Processes data (e.g. formats data as HTML and writes it to the DOM).

4. Proxy server also simplifies the data
[{name: 'Kabul House', id: 4572121, address: '1234 Main St...'}]



Takeaway

When Spotify asks you to use this endpoint....

<https://api.spotify.com/v1/search>

...use this endpoint instead...

<https://www.apitutor.org/spotify/simple/v1/search>

[DEMO using Postman]

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Today's Activity

Interacting with UNCA's Course API

Your Tasks: Part 1 (No Loops)

1. Output the title of the first course to the console.
2. Output the name of the course's instructor to the console.
3. Output the title of the first course to the #results section.
4. Output the title and the instructor of the first course to the #results section.

Your Tasks: Part 2 (Loops & Conditionals)

5. Output ALL of the course titles to the console.
6. Output ALL of the course titles to the #results section.
7. Output ALL of the diversity intensive courses to the results section.
8. Questions to ponder:
 - How could you make this interface more useful and engaging?
 - How could you allow your user to...
 - i. Select which department they want to view?
 - ii. Select which term they want to view?
 - iii. Only view classes that meet on Tuesdays and Thursdays?