WEEK 7

10.4.21

Agenda

THIS WEEK (7)

Discussion / Share / Review

APIs + Data

JSON (JavaScript Object Notation)

Intro to Postman

API Workshop

Assignment 5: TBD

NEXT WEEK (8)

Intro to Digital Design and Fabrication

Assignment 6:
3D Design Project

SHARE

Objectives

- Learn about API's are and how they can be used
- Learn about the JSON data format is and how it can be used to store information
- Learn about GET and POST requests and how they are used
- Learn about building and using custom APIs
- Become familiar with tools for working with APIs

APIs

What’s an API?

An Application Programming Interface (API) is a data transfer layer that enables data transmission between two pieces of software. APIs consist of two main components:

1. **Specification**. Technical specifications that describe data exchange details. They determine how the data will be retrieved.

2. **Interface**. Interface ensures the communication between two applications. REST, RPC, SOAP are the most popular API interfaces.

How API works

Types of requests

GET

This request is used to get a resource from a server. If you perform a ‘GET’ request, the server looks for the data you requested and sends it back to you. In other words, a ‘GET’ request performs a ‘READ’ operation. This is the default request method.

POST

This request is used to create a new resource on a server. If you perform a ‘POST’ request, the server creates a new entry in the database and tells you whether the creation is successful. In other words, a ‘POST’ request performs an ‘CREATE’ operation.

PUT

These two requests are used to update a resource on a server. If you perform a `PUT` or `PATCH` request, the server updates an entry in the database and tells you whether the update is successful. In other words, a `PUT` or `PATCH` request performs an `UPDATE` operation.

DELETE

This request is used to delete a resource from a server. If you perform a `DELETE` request, the server deletes an entry in the database and tells you whether the deletion is successful. In other words, a `DELETE` request performs a `DELETE` operation.

Resources

The following resources are great for learning more about APIs. These links can all be found on the class website under "**Development/APIs**".

- What is an API? In English, please.
- How to Use an API: Just the Basics
  This article covers the basics of APIs. Easy to read and understand.
- What Is an API: Concept and Architecture Types Explained on Real-Life Examples
- Understanding and using REST APIs
- Awesome-API *by Kikobeats*
- public APIs *by public-apis*
  Huge (free) list of public APIs
- Public-APIs *by n0shake*
  Annnnnnnd another list

JSON

What is JSON?

JavaScript Object Notation (JSON) is a text format for storing and transporting data.

- JSON is "self-describing" and easy to understand
- JSON is a lightweight data-interchange format
- JSON is plain text written in JavaScript object notation
- JSON is used to send data between computers

JSON Syntax

JSON syntax is derived from JavaScript object notation syntax:

- Data is in name/value pairs

```
"name":"John"
```

- Data is separated by commas

```
“name”:”John”,
“age”: 25
```

- Curly braces hold objects

```
{ “name”:”John” }
```

- Square brackets hold arrays

```
“cars”:["Ford", "BMW", "Fiat"]
```

Resources

The following resources are great for diving deeper into the many toolsets used by developers.

- JS JSON (W3 Schools)
- JS Syntax (W3 Schools)
- Example of JSON response from Github API https://api.github.com/users/rjduran
- JSON Formatter - Chrome extension to make JSON easier to read

BREAK

API Workshop

Using Postman to test API endpoints

Let’s get familiar with some APIs by sending GET requests using Postman.

1. Download and install Postman. Signup for free account to be able to save Collections.
2. Create a Collection aka group of request types in Postman.
3. Examples
    - Send GET request - http://numbersapi.com/
    - Send GET request and POST request to https://getsandbox.com/
    - Send a GET request to Student Directory API built with Strapi on Heroku
    - Send a GET request to Spotify for artist, album, and track data (login required)
        - Looking at the JSON response, can you find the 30 sec track preview link?

Resources

The following resources are great for going deeper into using Postman to test APIs.

- Sending a first request
- Building requests

ASSIGNMENT 5

Assignment 5

Objective: Make something using one or more APIs.

- Idea 1: Continue working on your Student Directory project using data provided by the API I built and showed in class.
  Skills: HTML, CSS, JS, front-end framework docs

- Idea 2: Built your own API and create front-end web page to demonstrate it's use.
  Skills: HTML, CSS, JS, front-end framework docs, API building tool, Postman

- Idea 3: Choose an API and learn how to use it. Consume the data by visualizing it with p5.js or creating a front-end web page to demonstrate it’s use.
  Skills: HTML, CSS, JS, Postman, API documentation

- Idea 4: API Mashup - Spec out the concept by drawing or sketching it out. Use block diagrams, flow charts, or mind mapping tools to visualize the connections between APIs. Attempt to build something with the APIs involved.
  Skills: HTML, CSS, JS, Postman, API documentation, making diagrams

- Idea 5: Develop a tutorial that demonstrates how to work with a specific API. How do you issue GET requests to the available endpoints? What are the basic steps? What tools are involved?
  Skills: HTML, CSS, JS, Postman, API documentation, making diagrams, writing instructions

- Idea 6: ???

QUESTIONS?