Web Advanced: Javascript APIs

“We will learn JavaScript properly. Then, we will learn useful design patterns. Then we will pick up useful tools to understand the modern world of coding.”

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HELLO.

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https://canvas.newschool.edu/courses/1661668

https://replit.com/@jaink/pgte-5505-f22

https://NewSchool.zoom.us/j/91939750510?pwd=dE5tM1dzeUlpelNlQTJYUUVBY003UT09

https://github.com/kujain/F22-5505_Javascript

INTRODUCTIONS

Why Learn Coding?

DON'T LEARN

- Learning curve/mental blockade.
- Too much specialization.
- Apps available to helps auto-generate code.
- Coding standards and patterns are constantly evolving.

DO LEARN

- Better understanding of the process needed to build.
- Better understanding of limits.
- Create more efficient and responsible design.

QUIZ

What does a Program look like?

➔ Let’s Compare Code written in different languages...

MACHINE LANGUAGE

```
01001000 01100101 01101100
01101100 01101111 00100000
01010111 01101111 01110010
01101100 01100100
```

OUTPUTS: **HELLO WORLD**

C++

```cpp
#include <iostream>
using namespace std;

int main()  {
   float length, width, area;
   cout << "Enter The Length: ";
   cin >> length;
   cout << "Enter The Width: ";
   cin >> width;
   area = length*width;
   cout <<"Answer is : "<< area << endl;
   return 0;
}
```

JAVA

```
public static int fctl(int n)
{  int result = 1;
      for(int i = 2; i <= n; i++)
         result *= i;
      return result;
}


factl(10)
```

PHP

```php
<?php

class Vegetable {
   var $veg;
   var $color;

   function __construct($veg, $color="green") {
       $this->veg = $veg;
       $this->color = $color;
   }

   function get_name() {
       return $this->veg;
   }

   function what_color() {
       return $this->color;
   }
} // end of class Vegetable

$Veg = new Vegetable( "tomato", "red");
echo $Veg->get_name() . " is " . $Veg->what_color();

?>
```

P5

```
function setup() {
  let d = 70;
  let p1 = d;
  let p2 = p1 + d;
  let p3 = p2 + d;
  let p4 = p3 + d;

  createCanvas(720, 400);
  background(0);
  noSmooth();

  translate(140, 0);

  // Draw
  stroke(150);
  line(p3, p3, p2, p3);
  line(p2, p3, p2, p2);
  line(p2, p2, p3, p2);
  line(p3, p2, p3, p3);
}
```

RUBY

```ruby
items = [ 'Mark', 12, 'goobers', 18.45 ]
for stuff in items
    print stuff, " "
end

print "\n"
```

JAVASCRIPT

```
let score = 75;          // Score
let msg;                 // Message

if (score >= 50) {
  msg = 'Congratulations!';
  msg += ' Proceed to the next round.';
  let el =
document.getElementById('answer');
  el.textContent = msg;
}

<div class="var"
id="answer">'Congratulations….</div>
```

Why Javascript?

In the Beginning…

Mocha? Java?

The Browser Wars

The AJAX revolution

The Standards War

Beyond the Browser

Javascript...Python...C#...R

What Can Javascript do?

Generative
http://color-wander.surge.sh/

Practical
https://usecubes.com/design

Informative
http://www.histography.io/

Apps
http://ubereats.com

https://www.facebook.com/

Entertainment
https://www.netflix.com/

3D
http://alteredqualia.com/three/examples/webgl_city.html

Quick List of Features

- Written to enable both-way interaction in web browsers
- Interpretive: compiled at runtime
- Always backward-compatible by design
- Loose type declaration: makes it flexible and confusing at the same time
- Has functions that can be used as variable objects
- Allows both functional and object-oriented programming
- Many ways to approach asynchronous events
- Many ways to use design patterns
- Many popular frameworks: jQuery, Angular, Vue, React
- Isomorphic - can be used in frontend and servers

Syllabus

- ➔ Syntax and Constructs
- ➔ Document Object Model
- ➔ Forms and AJAX
- ➔ Classes and Object Oriented Programming
- ➔ Functional Programming
- ➔ Modules and DevOps
- ➔ Web/HTML APIs
- ➔ DevOps Workflows
- ➔ Advanced: Frameworks(Vue/React)
- ➔ JS in the Backend: Nodejs
- ➔ Final Project Development

Tools of the Trade

➔ Text Editors

Sublime Text:	https://www.sublimetext.com/
Atom:	https://atom.io/
MS Visual Studio	https://visualstudio.microsoft.com/vs/mac/
Chrome DevTools:	https://developer.chrome.com/devtools

and more…

➔ Browsers (latest versions)

Chrome:	https://www.google.com/chrome/
Firefox:	https://www.mozilla.org/en-US/firefox/
Safari:	OSX only

➔ Debugger & Tools

Built in Browser Developer Console (Fn + F12)

Patterns Reference: https://jstherightway.org/

➔ Automators

NPM, Babel, Gulp
(will be discussed during DevOps session)

Creating a Basic HTML Template

https://replit.com/@jaink/pgte-5501-f22

```
<!DOCTYPE html>

<html>

  <head>
    <meta charset="utf-8">
    <meta name="viewport"
content="width=device-width">

    <title>The Parsons Web Project</title>
    <meta name="description" content="Fall 2022
Class">
    <meta name="author" content="Parsons Faculty">
    <link rel="stylesheet" href="css/styles.css">
  </head>

  <body>

    <header>This is the header</header>

    <section>This is Section 1</section>

    <section>
      <button id="button">Click me</button>
    </section>

    <!-- script always before closing body tag -->
    <script src="js/scripts.js"></script>
  </body>

</html>
```

Our First Javascript Code

➔ **Hello World!**

```
console.log(‘Hello’);
```

➔ **Using vars with Hello World!**

```
let greeting_container;
// assign greeting to variable
greeting_container = “Hello”;
console.log(greeting_container);
```

➔ **Generate an Alert**

```
alert(‘Greetings ’ +
greeting_container);
```

➔ **Update the Document**

```
document.write('<p>’ +
greeting_container + ’</p>');
```

Inline vs External

➔ **INLINE:**

```
  <body>

    <header>This is the header</header>

    <section>This is Section 1</section>

    <section>
      <button id="button">Click me</button>
    </section>

    <!-- script always before closing body tag -->
    <script>
         console.log('Hello');
         // more stuff
   </script>
  </body>
</html>
```

➔ **EXTERNAL:**

```
     </section>

    <!-- script always before closing body tag -->
    <script src="js/scripts.js"></script>
  </body>
```

Our Second Javascript Code

➔ **Event Listener**

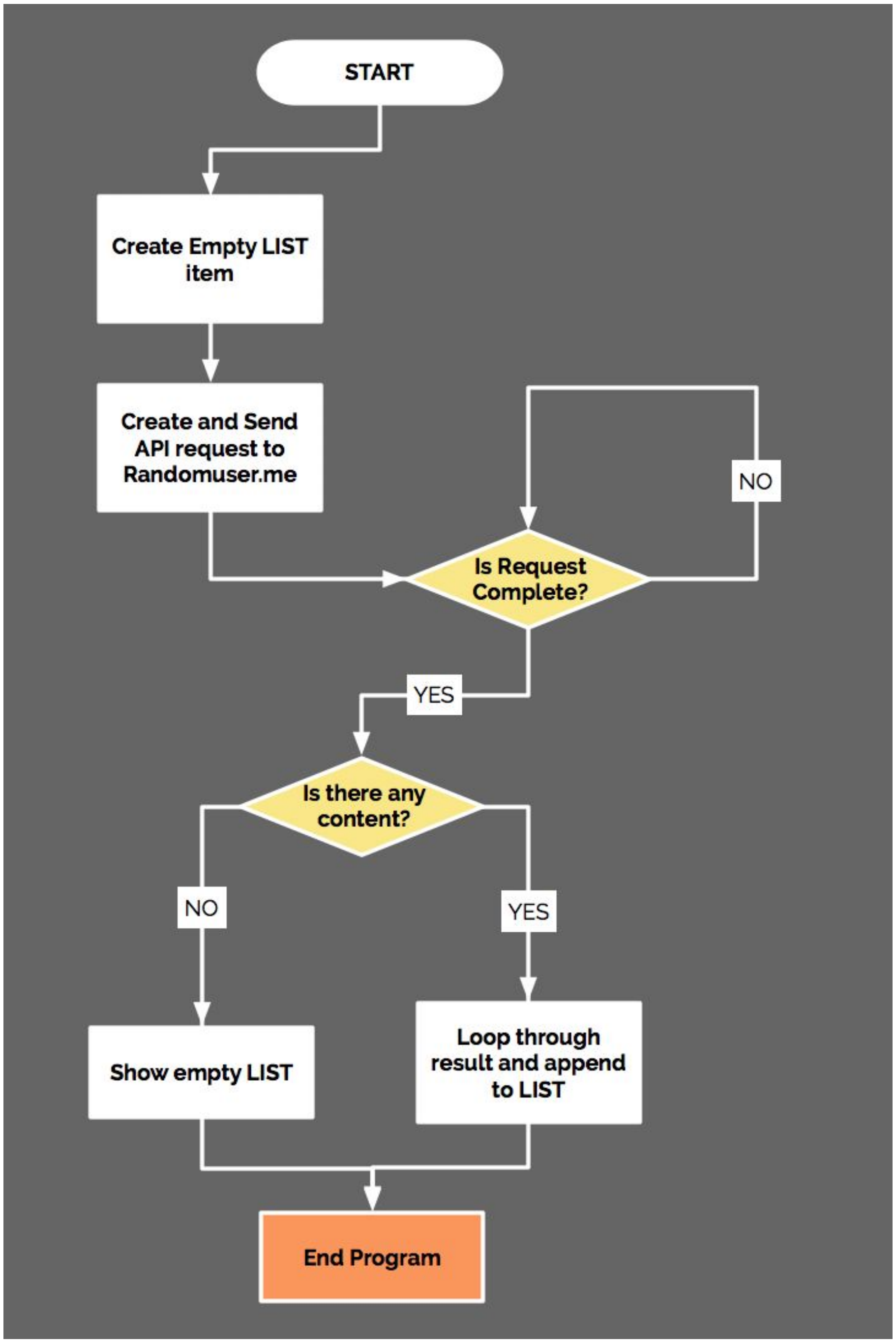
```
/* event listener to change body
background */

const btn =
document.getElementById('button');


const rainbow =
['red','orange','yellow','green','blue','
rebeccapurple','violet'];

function change() {

  document.body.style.background =
rainbow[Math.floor(7*Math.random())];

}

btn.addEventListener('click', change);
```

Our Third Javascript Code

➔ DOM Manipulation

```javascript
/* Simple DOM Manipulation example */
const now = new Date();
const hours = now.getHours();

document.write(`It's now: ${hours}. <br><br>`);
let bgColor = "lightorange";

if (hours > 17 && hours < 20){
  bgColor = "orange";
}
else if (hours > 19 && hours < 22){
  bgColor = "orangered";
}
else if (hours > 21 || hours < 5){
  bgColor = "#C0C0C0";
}
else if (hours > 8 && hours < 18){
  bgColor = "lightblue";
}
else if (hours > 6 && hours < 9){
  bgColor = "skyblue";
}
else if (hours > 4 && hours < 7){
  bgColor = "steelblue";
}
else {
  bgColor = "white";
}

document.body.style.backgroundColor = bgColor;
```

Our 4th Javascript task - flow



Our 4th Javascript Code

➔ Connect with API using AJAX

➔ `API endpoint: https://randomuser.me`

```
const ul = document.createElement('ul');
const url = 'https://randomuser.me/api/?results=10';
const xhr = new XMLHttpRequest();
xhr.onerror = function() { // only triggers on error
     alert(`Oops - we cannot not do this!`);
};
xhr.onload = function() {
     if (xhr.status == 200) {
        let authors = JSON.parse(xhr.responseText); // Get
results

        for (key in authors.results) { // loop through the
results
          let author = authors.results[key]; //assign current row
to author var
          let li = document.createElement('li'), //  Create the
elements we need
              img = document.createElement('img'),
              span = document.createElement('span');
          img.src = author.picture.medium;  // Add the source of
the image to be the src of the img element
          span.innerHTML = author.name.first + ' ' +
author.name.last; // Make the HTML of our span to be the first
and last name of our author
          li.appendChild(img); // Append img element back to
containing li
          li.appendChild(span); // Append span element back to
containing li
          ul.appendChild(li); // Append li element back to
containing ul
          document.body.append(ul); //Append the new ul to body
        }
    }
}

xhr.open('GET', url, true);
xhr.send(null);
```

Our 4th Javascript Code (alternative)

➔ Connect with API using Fetch API

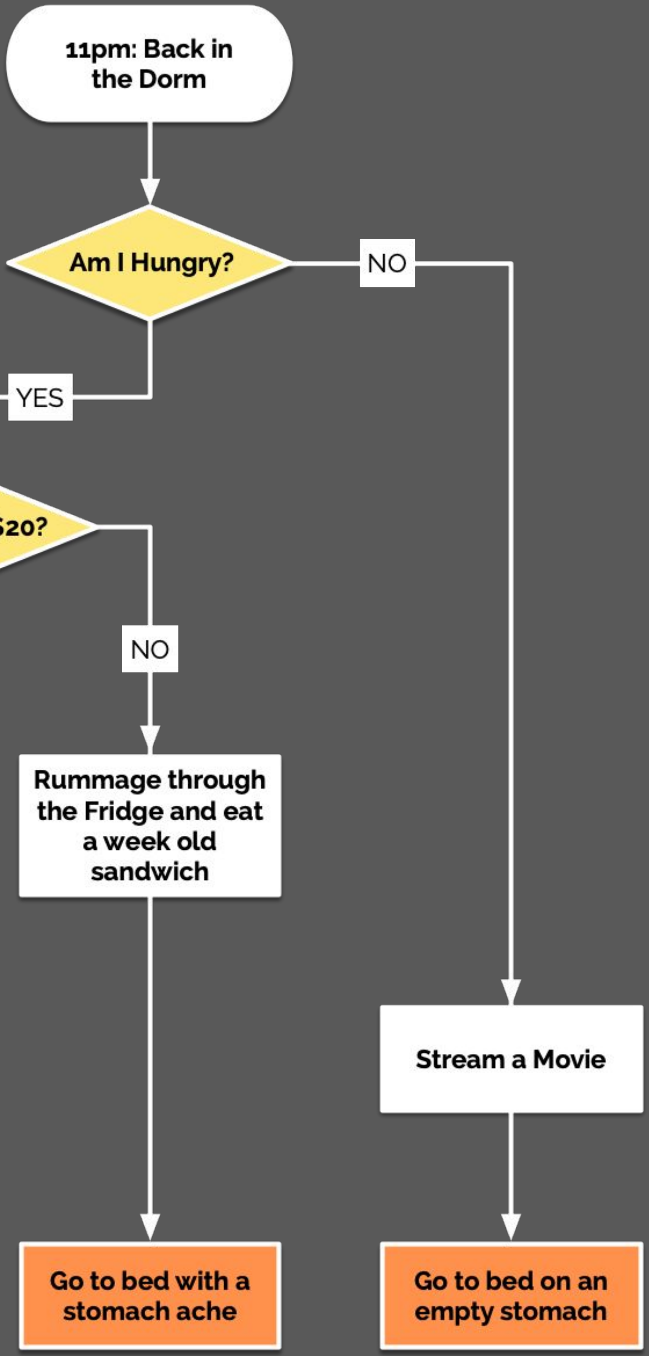
API endpoint: https://randomuser.me

```
const ul = document.createElement('ul');
const url = 'https://randomuser.me/api/?results=10';

fetch(url)
    .then((resp) => resp.json())
    .then(function(data) {

        console.log(data);

        let authors = data.results; // Get the results
        authors.forEach(function(author) { // Map through the
results and for each run the code below
          let li = document.createElement('li'), //  Create the
elements we need
              img = document.createElement('img'),
              span = document.createElement('span');
          img.src = author.picture.medium;  // Add the source of
the image to be the src of the img element
          span.innerHTML = `${author.name.first}
${author.name.last}`; // Make the HTML of our span to be the
first and last name of our author
          li.appendChild(img); // Append all our elements
          li.appendChild(span);
          ul.appendChild(li);
        })

        document.body.append(ul);
    })
    .catch(function(error) {
        console.log(error);
    });
```

Assignment: Decision Trees

Find a regular online or physical activity or task that requires some interaction and decision-making. Write the process flow out in detail.

eg. Dining Options back in the Dorm:



Next Class

- ➔ **Javascript Structure**
- ➔ **Javascript Syntax:**

  Data types: strings, numbers, variables, arrays

  Operators

  Conditional logic

  Loops