GENERAL ASSEMBLY

FRONT END WEB DEVELOPMENT

CLASS 12: OBJECTS & WEB APIS

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OBJECTIVES

- Objects
  - Syntax
  - Constructors
  - Methods
- JSON
  - Parsing and generating
- APIs

OBJECTS

THE WHAT & WHY OF OBJECTS

- An object in JavaScript is like an object in real life
- Encapsulates “properties” that define its characteristics
- A “property” is like a variable attached to the object
- A “car” object might have “colour”, “make” and “model” properties
- Properties can be any data type – strings, numbers, even other objects!

DEFINING AN OBJECT

```
var car = {
  make: "BMW",
  model: "1 Series",
  year: 2013
};
```

ACCESSING PROPERTIES

```
car.make
  => "BMW"
car.model
  => "1 Series"
car.topSpeed
  => undefined
```

PROPERTIES

- Use either the “dot notation” or “bracket notation” to access properties of an object
  - `car.model`
  - `car["model"]`
- Properties can have their values reset after object instantiation using the dot or bracket notation
  - `car.model = "Ford"`
  - `car["model"] = "Ford"`

WHY SHOULD I CARE?

- We can already set arbitrary values to variables, so why encapsulate them inside an “object”?
  - What if you had hundreds or thousands of values to store? Would you want to create hundreds or thousands of distinct variables?
  - How do you logically link two distinct variables together? Objects are useful for “namespacing”.

CONSTRUCTORS

- The “object literal” syntax is useful for creating one-off objects, but gets verbose when we need a large or unknown number of objects
- A constructor function can define a template for object creation instead
- The `new` keyword lets us create a new instance of an object from a constructor function

CONSTRUCTOR EXAMPLE

```
function Car(make, model, year) {
  this.make = make;
  this.model = model;
  this.year = year;
}

var bmw = new Car("BMW", "1 Series", 2013);
var ford = new Car("Ford", "Capri", 1969);
```

CODE ALONG:
CAR FACTORY

METHODS

- As well as properties, objects can also have methods (functions that exist on an object, basically!)
- Those methods can use the properties of the object they exist on to modify their behaviour
- After instantiating a new copy of an object, you can call the methods defined on the object

```
function Car(make, model) {
  this.make = make;
  this.model = model;
  this.advert = function() {
    return this.make + " " + this.model;
  }
}

var bmw = new Car("BMW", "1 Series");
bmw.advert(); // Returns "BMW 1 Series"
```

JSON

JAVASCRIPT OBJECT NOTATION

- Pronounced “Jason”
- Devised by noted JavaScript master Douglas Crockford
- Format for transmitting data structures in a platform-agnostic way between a server and a web application
- JSON looks a lot like a JavaScript object… but more stringy!

WHY SHOULD I CARE?

- It's the most common format for data interchange on the web
- Most public APIs will emit their data in JSON (Twitter, Google, Facebook, etc)
- The older formats like XML are a pain to parse
- Your web browser can transparently turn a JSON response from a web API into a JavaScript object for you to put in the DOM

JAVASCRIPT OBJECT

```
{
  make: "BMW",
  model: "1 Series",
  year: 2013
}
```

JSON STRING

```
"{
  "make": "BMW",
  "model": "1 Series",
  "year": 2013
}"
```

They're the same, just string-ier.

TOOLS

- JSONView for Google Chrome lets you view prettified JSON in your browser
- JSONLint is a web app for validating your JSON is valid – much like JSHint for JavaScript.
- Your browser can “stringify” a JavaScript object into a JSON string and vice-versa
  - `JSON.stringify({name: "James"});`
  - `JSON.parse("{'name': 'James'}");`

WEB APIS

API

- Stands for Application Programming Interface
- An API describes how software components interact with each other, differently to a UI that describes how a user takes to the software
- Your phone might provide an application developer a “camera” API, which would have methods for taking photos, downloading photos, enabling the flash and so on. The application developer therefore needn’t write this code.

WEB APIS

- Some businesses expose their data for consumption through APIs
- Web APIs that expose data generally emit using the JSON format
  - Radio 1 Playlist JSON example
- Web APIs can be used not only for consuming data, but also for exposing functionality
  - Twilio allow you to send and receive text messages and phone calls through their API

PARSING JSON WITH JQUERY

- jQuery provides some helpful methods for retrieving and parsing JSON
- `$.get(url, callback)` for fetching remote files
- `$.parseJSON(string)` to parse a JSON string into a JavaScript object
- And even better, `$.getJSON(url, callback)` does both in one fell swoop
- Note: the remote data source must support `JSONP` or `CORS`

`getJSON`'s callback function exposes a `data` object that is the JavaScript object parsed from the JSON string retrieved from the URL

```
$.getJSON("http://site.com/1.json", function(data) {
  console.log(data);
});
```

CODE ALONG:
MY REDDIT