JavaScript Libraries

JavaScript Libraries

- Advanced JavaScript programming (especially the complex handling of browser differences), can often be very difficult and time-consuming to work with.
- To deal with these difficulties, a lot of JavaScript (helper) libraries have been developed.
- JavaScript libraries – sometimes called "frameworks"
- Popular JavaScript libraries:
  - jQuery (https://jquery.com/)
  - Modernizr (http://modernizr.com/)
  - MooTools (http://mootools.net/)
  - Prototype (http://prototypejs.org/)
- All of these frameworks have functions for common JavaScript tasks like animations, DOM manipulation, and Ajax handling.

Advantages and disadvantages

Advantages

- Speeds up the development process
- Clean and tidy code
- Solutions to common problems
- Browser compatibility
- Learn good practices
- Helpful in collaborative work

Disadvantages

- Unused code leftover
- Another learning curve
- You don’t learn to do it yourself
- Inherit bugs & bad practices

Is it advisable to use a library?

When installing, learning and using a library, at what point do you realize it would have been faster or easier to code it yourself from the ground-up?

jQuery

- **jQuery** is the most popular JavaScript framework on the Internet today.
- It uses CSS selectors to access and manipulate HTML elements (DOM Objects) on a web page.
- jQuery also provides a companion UI (user interface) framework and numerous other plug-ins.
- Many of the largest companies on the Web use jQuery:
  - Google
  - Microsoft
  - IBM
  - Netflix

jQuery In Use

- The main jQuery function is the $() function (the jQuery function).
- jQuery allows you to select elements by CSS selectors.
- Example in JavaScript, you can insert HTML content into an element with an ID:
  - Step 1: Target the ID in the HTML (it must be an ID), get a "handle" on the element in the DOM, and assign the handle to a new variable
  - Step 2: Assign some HTML content to the "inside node" of the variable

```
var myVariable = document.getElementById("myHeading");
myVariable.innerHTML = "JavaScript says Hello World!";
```

- The jQuery equivalent:
  - Step 1: Send some HTML content to the ".html()" method that is associated with the targeted CSS selector

```
$(".anySelector").html("jQuery says Hello World!");
```

jQuery's Popularity

- **Reuse of CSS Selectors**
  - **Leverages what Web Developers already know: how to target HTML elements using selectors**
  - **Implemented advanced CSS3 selectors, proposed by the W3C, before most browsers had implemented them yet (i.e. it was built to be future compatible)**
- **Unobtrusive by Design**
  - **Respects progressive enhancement – Web Developers could add functionality without having to hack-up their HTML documents in any way**
- **It's Simple**
  - **Built to be easy for Web Developers to implement**

    ```
    $(".someSelector").someAction()
    ```
  - **Follows: the "Principle of least astonishment"**

CDN - Content Delivery Networks

- You always want your web pages to be as fast as possible. You want to keep the size of your pages as small as possible, and you want the browser to cache as much as possible.
- If many different web sites use the same JavaScript framework, it makes sense to host the framework library in a common location for every web page to share.
- A CDN (Content Delivery Network) solves this. A CDN is a network of servers containing shared code libraries.
- Google provides a free CDN for a number of JavaScript libraries, including:
  - jQuery
  - Prototype
  - MooTools
  - Dojo
  - Yahoo! YUI

Google: http://code.google.com/apis/libraries/devguide.html
Microsoft: http://www.asp.net/ajax/cdn
CDN JS: https://cdnjs.com/

Where to get jQuery

- Option 1: download and install from www.jquery.com
  <script src="js/jquery.js"></script>

- Option 2: use a Content Delivery Network (CDN)
  - Reliable servers that let you link directly to online versions of common resources (like jQuery)
  - Example: http://ajax.googleapis.com/ajax/libs/jquery/1.11.0/jquery.min.js

  - Usage…

```
<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.11.0/jquery.min.js"></script>
```

  - Or, for development (less typing)…

```
<script src="http://code.jquery.com/jquery.js"></script>
```

Minification

- **To Minify Code** in a computer programming language (e.g. JavaScript): remove all the unnecessary characters (comments, line breaks, extra spaces) from the source code without changing its functionality
- Why minify? Faster Websites.
  - Faster downloads
  - Fewer HTTP requests (when minifying multiple libraries together)
- See: http://code.jquery.com/jquery/

Unminified (normal)

```
/*!
 * jQuery JavaScript Library v2.1.3
 * http://jquery.com/
 *
 * Includes Sizzle.js
 * http://sizzlejs.com/
 *
 * Copyright 2005, 2014 jQuery Foundation, Inc. and other contributors
 * Released under the MIT license
 * http://jquery.org/license
 *
 * Date: 2014-12-18T15:11Z
 */

(function( global, factory ) {

	if ( typeof module === "object" && typeof module.exports === "object" ) {
		// For CommonJS and CommonJS-like environments where a proper `window`
		// is present, execute the factory and get jQuery.
		// For environments that do not have a `window` with a `document`
		// (such as Node.js), expose a factory as module.exports.
		// This accentuates the need for the creation of a real `window`.
		// e.g. var jQuery = require("jquery")(window);
		// See ticket #14549 for more info.
		module.exports = global.document ?
			factory( global, true ) :
			function( w ) {
				if ( !w.document ) {
					throw new Error( "jQuery requires a window with a document" );
				}
				return factory( w );
```

Minified

```
/*! jQuery v2.1.3 | (c) 2005, 2014 jQuery Foundation, Inc. | jquery.org/license */
!function(a,b){"object"==typeof module&&"object"==typeof module.exports?module.exports=a.document?b(a,!0):function(a)
{if(!a.document)throw new Error("jQuery requires a window with a document");return b(a)}:b(a)}("undefined"!=typeof window?
window:this,function(a,b){var c=[],d=c.slice,e=c.concat,f=c.push,g=c.indexOf,h={},i=h.toString,j=h.hasOwnProperty,k=
{},l=a.document,m="2.1.3",n=function(a,b){return new n.fn.init(a,b)},o=/^[\s\uFEFF\xA0]+|[\s\uFEFF\xA0]+$/g,p=/^-ms-/,q=/-
([\da-z])/gi,r=function(a,b){return b.toUpperCase()};n.fn=n.prototype=
{jquery:m,constructor:n,selector:"",length:0,toArray:function(){return d.call(this)},get:function(a){return null!=a?0>a?
this[a+this.length]:this[a]:d.call(this)},pushStack:function(a){var b=n.merge(this.constructor(),a);return
b.prevObject=this,b.context=this.context,b},each:function(a,b){return n.each(this,a,b)},map:function(a){return
this.pushStack(n.map(this,function(b,c){return a.call(b,c,b)}))},slice:function(){return
this.pushStack(d.apply(this,arguments))},first:function(){return this.eq(0)},last:function(){return this.eq(-1)},eq:function(a)
{var b=this.length,c=+a+(0>a?b:0);return this.pushStack(c>=0&&b>c?[this[c]]:[])},end:function(){return
this.prevObject||this.constructor(null)},push:f,sort:c.sort,splice:c.splice},n.extend=n.fn.extend=function(){var
a,b,c,d,e,f,g=arguments[0]||{},h=1,i=arguments.length,j=!1;for("boolean"==typeof g&&(j=g,g=arguments[h]||
{},h++),"object"==typeof g||n.isFunction(g)||(g={}),h===i&&(g=this,h--);i>h;h++)if(null!=(a=arguments[h]))for(b in
a)c=g[b],d=a[b],g!==d&&(j&&d&&(n.isPlainObject(d)||(e=n.isArray(d)))?(e?(e=!1,f=c&&n.isArray(c)?c:[]):f=c&&n.isPlainObject(c)?
c:{},g[b]=n.extend(j,f,d)):void 0!==d&&(g[b]=d));return g},n.extend({expando:"jQuery"+
(m+Math.random()).replace(/\D/g,""),isReady:!0,error:function(a){throw new Error(a)},noop:function(){},isFunction:function(a)
{return"function"===n.type(a)},isArray:Array.isArray,isWindow:function(a){return null!=a&&a===a.window},isNumeric:function(a)
{return!n.isArray(a)&&a-parseFloat(a)+1>=0},isPlainObject:function(a)
{return"object"!==n.type(a)||a.nodeType||n.isWindow(a)?!1:a.constructor&&!j.call(a.constructor.prototype,"isPrototypeOf")?!1:!0
},isEmptyObject:function(a){var b;for(b in a)return!1;return!0},type:function(a){return null==a?a+"":"object"==typeof
a||"function"==typeof a?h[i.call(a)]||"object":typeof a},globalEval:function(a){var b,c=eval;a=n.trim(a),a&&(1===a.indexOf("use
strict")?(b=l.createElement("script"),b.text=a,l.head.appendChild(b).parentNode.removeChild(b)):c(a))},camelCase:function(a)
{return a.replace(p,"ms-").replace(q,r)},nodeName:function(a,b){return
a.nodeName&&a.nodeName.toLowerCase()===b.toLowerCase()},each:function(a,b,c){var d,e=0,f=a.length,g=s(a);if(c){if(g)
```