An introduction to the JavaScript language through the original innovative language making JavaScript better

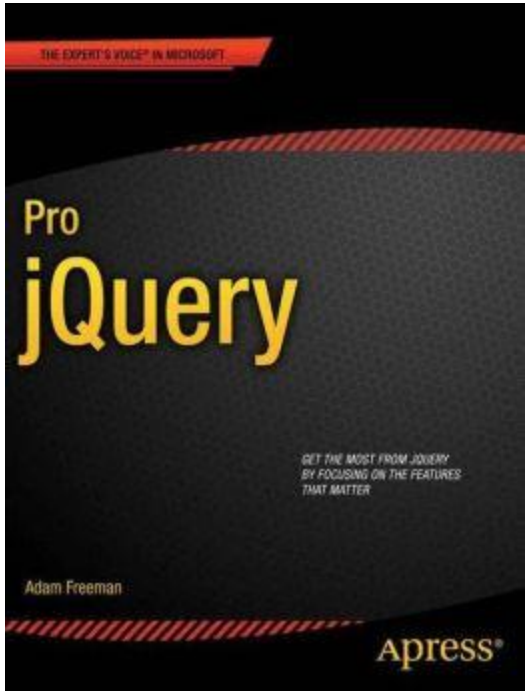
CENTRIQ TRAINING

Topics

- Covered
  - How to set up and use jQuery and jQuery UI
  - How to manage basic web design needs
- Not covered
  - How to program
  - How to use JavaScript
  - How to build a web app

Course resources

- Book
  - Pro jQuery 2.0
    Adam Freeman
    Apress
    February 24, 2012
- Files
  - http://github.com/doughoff/wd-505



jQuery intro

DOM

- Document Object Model
- The html collection of nodes represented by an XML tree in memory of the browser created by parsing and fixing the html sent by the server.
- Any change to the DOM immediately fires a redraw to the browser screen.

What is jQuery?

- a JavaScript library created in 2006
  - standards compliant
  - light-weight (92k)
  - cross-browser compatible
  - adopted by market leaders
- UI widgets became jQueryUI
- Mobile solution became jQuery Mobile
  - not an additional jQuery library, a new scripting language

Why use jQuery?

- Easier to read/write than JavaScript
  - Compatibility, DOM effects, AJAX
  - Uses simple CSS selectors
- Manages cross-browser incompatibilities
  - Becoming less important
- Extensible by plugins
- Industry adoption – Oracle, Google, Microsoft, IBM…

Simpler syntax for DOM

jQuery	JavaScript
$(function( ) { // code…});	document.addEventListener('DOMContentLoaded', function() { // code… });
var divs = $('div');	var divs = document.querySelectorAll('div');
var aDiv = $(' ');	var aDiv = document.createElement('div');

jQuery source code

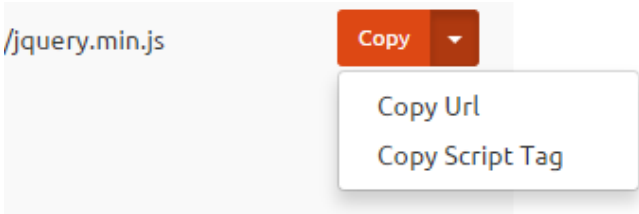
- Current versions (7/2017) (min: 85k)
  - Core: **3.2.1** Slim (no ajax and effects) (min: 68k)
  - UI: **1.12.1**
- Sources
  - local copy
  - **CDNs**
    - jQuery, Google
    - http://cdnjs.com/ (for open source libraries)

jQuery Migrate

- Use in development and testing
  - Restores deprecated features and behaviors
  - Two versions
    - Migrating older code since 1.9
    - Migrating code from 1.9 to 3.0
- Displays warning messages
  - Only the non-minified version.
- `<script src="https://cdnjs.cloudflare.com/ajax/libs/jquery-migrate/3.0.0/jquery-migrate.js"></script>`

Downloading jQuery

- Local
  - `<script src='/script/jquery-1.11.1.min.js'></script>`
  - `<script src='/script/jquery-ui-1.11.1.custom.min.js'></script>`
- Google CDN
  - `<script src='http://ajax.googleapis.com/ajax/libs/jquery/3.1.0/jquery.min.js'></script>`
- cdnjs.com
  - **Search for jquery and click on link. Paste in file.**



Versions

- Always use latest version?
  - Not best practice for production
    - http://code.jquery.com/jquery-latest.js
    - http://ajax.googleapis.com/ajax/libs/jquery/1/jquery.min.js
- Use 1.9?
  - If you need IE 6, 7 & 8 support stay with 1.12.*
  - 2+ versions are about 20% smaller by dropping IE's old version compatibility

Versions

- Non-minified
  - for study or debugging
- minified (.min.js)
  - no need to read the code
  - production
  - faster to download
    - for better user experience
    - no line breaks, single spaces, short variable names
- Slim – no ajax and effects

Using plugins

- Always look for a plugin
  - will likely fix any browser problems
  - will add features
  - will look state-of-the-art
  - will speed up development
  - makes code more readable
- Look for the most recent plugin in a Google search
- Look at most recent overviews of plugins

Writing jQuery

On the web page

- jQuery loaded first
- Then JavaScript/jQuery code is written in a <script> tag below it
  - `<script src='/script/jquery-#.#.#.min.js'></script>`
  - `<script>`
    - `//this is where code goes (not DOM related)`
  - `</script>`
  - DOM (HTML)
  - `<script> this is DOM related code </script>`

On the web page

- Sequence of events
  - browser requests URL and receives html file
  - browser loads html
    - Supporting files are requested and loaded async when read
    - JavaScript at the beginning is executed.
    - HTML5 provides a defer attribute to delay loading scripts
    - jQuery can defer script execution with a 'document ready' function.
    - DOM is loaded and rendered
    - document.load event is fired (blue? line in Network tab)
    - JavaScript at end is executed and can operate on DOM
  - changes to DOM are rendered immediately

On the web page

- Bottom of page
  - Traditional JavaScript
- Top of page
  - Put code in a jQuery document.load (ready) function that delays execution until the page loads
  - Use the HTML5 **defer** attribute with a src attribute
    - Opera does not support
    - Buggy in <IE10 – check http://caniuse.com

jQuery and JavaScript

- JavaScript code can be used at any point in jQuery code.
  - String and Math functions are popular to use.

jQuery function

- jQuery( )
  - more common is the alias $( )
- Four overloads
  - Depending on what is put in the parentheses, the function will do different things.

jQuery namespace

- jQuery.someFunction()
  - Or $.someFunction()
- These are jQuery namespaced functions
- Many utility functions
  - see also Underscore and Lo-Dash (merging)
- Protects from name collisions

jQuery function – select from DOM

- $('a CSS selector')
  - returns a jQuery object (array-like) of matched elements
- $('a CSS selector', context element)
  - Looks in a portion of the page
- Examples
  - $('div')
  - $('div', '#rightColumn')

jQuery function – JS to jQuery

- $(element(s) or object(s))
  - Returns a jQuery object (array-like element(s) or object(s))
  - Used when you use JavaScript usually to retrieve something from the page
- Examples
  - $(this)
  - $(document)

jQuery function – new HTML

- $('html we write', object with attributes)
  - Returns a jQuery object (array) of one new element
  - Used when adding html the DOM
- Examples
  - $(' This is my div ')
  - $(' ') or $(' ')

jQuery function - new HTML

- $('<img/>‘, **map**)
- **map** = a JavaScript object = JSON format
- {**src**: 'http://www.camp-4-paws.com/wp-content/uploads/2013/12/slider-dog3.png‘,
- **alt**: ‘a dog‘,
- …
- }

jQuery function – defer execution

- $(function( ){ …deferred code… });
  - executes the callback function of deferred code when document.load event is fired
  - Called the document ready or **ready function**
  - Used to defer execution of code placed before the DOM to the end of the page
  - Use for DOM manipulation code when placed before the DOM it works on.

jQuery function – defer execution

- The document.load event callback
- The short (anonymous) version (used in course)
  - **$(function( ) {**
  - alert('Testing…testing…');
  - **});**
- The long version
  - **$(document).ready(function( ) {**
  - alert('Testing…testing…');
  - **});**

jQuery ready function template

- This will be your template for DOM manipulation jQuery code at the top of the file
  - <script>
  - **$(** function( ) { // ready function
    code here
    } **)**; // end ready function
  - </script>
- Keep the comments to ensure you don't delete the line

Chaining statements

- Reuse selector and create terser code
  - $(…)
    .functionName1 (arg, arg, …)
    .functionName2 (arg, arg, …)
  - also called fluent style

JavaScript comments

- 2 styles
  - // ignored until the end of line
  - /*
    ignored
    until
    */

Exercise

- Follow instructions in Exercises handout for
  - Create an html template
  - (optional) Add a script template without anonymous functions

The jQuery function used to select nodes/elements/attributes

Selecting

Basic XML terms

- XML **document** – the entire text
- **element** – anything between and including the open tag and matching closing tag
  - **<a>ajdfkjhadhklha lj alskfjh ld<c>hjad jf hajldf</c></a>**
  - **<a></a>**
  - **<a />**
- **tag** – just the open or closing part, or empty element
  - **<a>**ajdfkjhadhklha lj alskfjh ld<c>hjad jf hajldf</c></a>

Basic XML terms

- body – what's in between the open and closing tags
  - <a>**ajdfkjhadhklha lj alskfjh ld<c>hjad jf hajldf</c>**</a>
  - <a>ajdfkjhad**hklha lj alskfjh ld**<c>hjad jf hajldf</c></a>
- attribute – meta data for the element
  - <x **id='the unknown'**>Dean Jagger as Dr. Adam Royston</x>
- XHTML – HTML - XML compliant
  - DTD – document that gives rules for XML language to validate data
  - DOCTYPE – instruction for browser to recognize data

HTML tree traversing

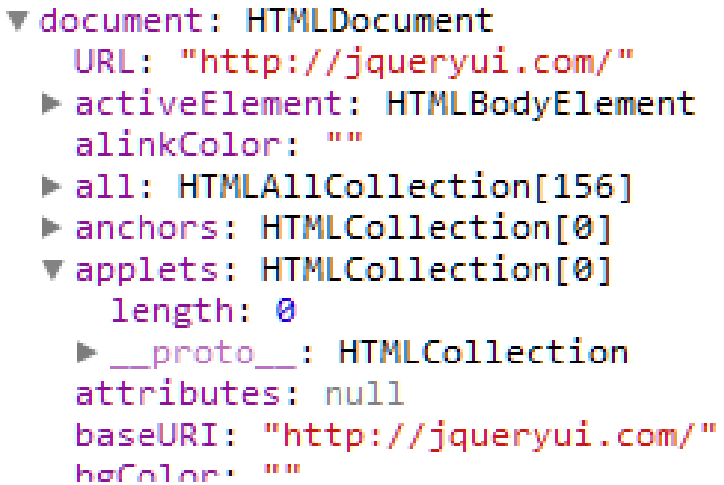
- **child**
  - the immediate nested level of an element
- **parent**
  - the immediate level of an element that an element is contained by
- **descendant**
  - any nested level of an element
- **ancestor**
  - any nested level that an element is in

HTML tree traversing

- parent of **b1** is **a**
  - ancestor of **c** is **a** is but is not a parent
- child of **a** is **b1**
  - descendant of **a** is **c** but is not a child
- sibling of **b1** is **b2**
  - <a>
    - aaaaaaaaaaaaaa
    - <b1>bbbbbbbbbbbbbbbbbbb</b1>
    - <b2>BBBBBBBBB<c>B</c>BBBBBBBB</b2>
    - aaaaaaaaaa
  - </a>

DOM

- DOM – document object model
  - JavaScript talks to the html text as an object called the **document**
  - subsets of the DOM are called fragments



DOM manipulation

- DOM – Document Object Model
  - the in-memory OO version of the HTML page
- Using JavaScript to change the DOM which then updates the rendered view of the browser
- The user sees a very responsive interactive page.

HTML

- **id** attribute
  - the unique name given to one element
  - CSS selects this with a # (pound sign) prefix
- **class** attribute
  - multiple elements can have the same class
  - CSS selects this with the **.** (period) prefix

Selecting by CSS

- Use CSS3 selectors
  - element - $('table')
  - class - $('table.data')
  - id (best) - $('table#celebs')
  - descendant - $('table tr td')
  - union - $('p,div,h1,input')
- Select as narrowly as you can
- Use matched quotes

Demo

- On a page that has loaded jQuery, run in the console:
  - $('p')
  - $('p').length – how many paragraphs are there?
  - $(‘div').
  - Etc.

Selecting by CSS

- CSS3 attribute selectors
  - any value- $('[title]') or $('a[title]')
  - matches - $('[title = “value”]')
  - does not match - $('[title != 'value']')
  - starts with - $('[title |= 'value']')
  - ends with - $('[title $= 'value']')
  - contains all - $('[title *= 'value']')
  - contains word - $('[title ~= 'value']')
  - union - $('[title = 'value'] [alt = 'value']')

Selecting by CSS

- Pseudo classes
  - :even, :odd, tr:eq(#)
  - :animated
  - :first, :last
  - :focus
  - :gt(#), lt(#)
  - :header
  - :not()

Selecting by CSS

- text nodes (body of element) are children too!
- children
  - :first-child, :last-child, nth-child(#) - one-based, only-child
- content
  - :contains('text'), :empty, :has(**selector**), :parent
- hierarchy
  - child - ('parent > child')
  - next adjacent - ('prev + next')
  - next sibling - ('prev ~ siblings')

Selecting by CSS

- Forms
  - :focus
  - :checked, :disabled, :enabled, :selected
- Visibility
  - :hidden, :visible
- Deprecated
  - :button, :file, :image, :text
  - :input, :password, :checkbox, :radio
  - :reset, :submit

Selecting with jQuery functions

- .is(**selector**)
  - if ($(this).is((':hidden')) …
- .not (**selector**)
  - $('p').not('#selected')
- .eq(#), .first( ), .last( ), has( )
- .slice( ) - $object →$objectSubsetByIndicesRange

Subselecting

- find by selector - includes only children
  - $('li').find('a')
  - $('li').find('.highlight')
    - $('li .highlight') or $('.highlight', 'li') is slower
- find by jQuery object
  - $('li').find($link)
- $(**selector**).find(**tagName**) // best
  = $(**tagName**, **selector**)
  = $('**selector tagName**')

Selecting by tree traversing

- .closest() – find the best parental match or itself
- .children(), siblings()
- .parent(), .parents(), .parentsUntil(), .offsetParent()
- .prev(), .prevAll(), .prevUntil(),
- .next(), .nextAll(), .nextUntil()

Selector optimization

- Fast to slow
  - ID
  - element name
  - CSS class
  - attribute value
  - CSS pseudo selector
- Moral
  - always use an ID for single selection

Testing in Chrome 16.0.912.63 32-bit on Windows Server 2008 R2 / 7 64-bit		
Test		**Ops/sec**
jQuery ID	`$("#foo");`	436,062 ±0.00% fastest
jQuery Tag	`$("blockquote");`	141,837 ±7.14% 67% slower
jQuery Class	`$(".bar");`	161,948 ±1.06% 63% slower
jQuery attribute	`$("[name='baz']");`	31,788 ±1.19% 93% slower
jQuery Pseudo-selector	`$(":hidden");`	557 ±0.71% 100% slower

Selector optimization

- Don't use CSS descendants
  - $('#id p');
- Use chained function calls
  - $('#id').find('p');
  - can be more than 2x as fast as the first

/selectors/alert*.html

Exercise

- Follow instructions in Exercises handout for
  - Show an alert when any link is clicked
  - Show an alert when a unique link is clicked
  - Show an alert when a link in a special div is clicked

Debugging workflow

1. Check console errors - F12
2. Check unchecked comment syntax
    1. CSS - /* */, #
    2. HTML - <!-- -->
    3. JavaScript - /* */, //
3. Load order errors
    1. jQuery, jQueryUI, DOM, DOM manip.
    2. jQuery, Migrate
    3. jQuery, plug-in
    4. normalize, theme, site CSS

Debugging workflow

4. DOM selection errors
    1. # for ids, period for classes, space for descendant
5. Logic errors - insert console.log( )
    1. to assert every known value as it is known
    2. to verify conditional blocks are running
6. Debugger
    1. debugger;
    2. Set a breakpoint

Exercise

- Follow instructions in Exercises handout for
  - Show output from a debug script and in the DOM

Events

Events

- The triggers that run code (event handlers)
- Pre-defined and managed by the browser
- Custom

Old event binding

- HTML binds the event handlers with attributes
  - <button **onclick**='document.getElementById('field2').value = document.getElementById('field1').value'>
- Poor coding practice
  - sprinkles code throughout document
  - better to combine code in one place

Event binding

- Add/register/**bind** your code/functions to the element on the browser's events
  - when the browser 'hears' a **click** event on the button it fires/does my **function**
- $('#aButton').**on('click',** function( ) **{**
  // custom button action
  });

Event binding

- Click handler for **all** links
  - $('a').on ('click', function() {
  - alert('Noooooooo. Don't leave!!!!');
  - });
- shortcut
  - $('a').click(function() {
  - alert('Noooooooo. Don't leave!!!!');
  - });

on( ), off( ) - 1.7

- **on**(events [, selector] [, data] , handler);
- **off**([events] [, selector] [, handler]);
  - **events** – event names e.g. 'click', 'click hover resize'
  - **handler** – the function to fire on the event(s)
- New methods unify event handling
  - no need for bind( ), delegate( ), or live( )
  - stop using bind, live, and delegate **now**!

Event handlers

shortcuts for on('event', callback function)

- .change()
- .click(), .dblclick()
- .error()
- .blur(), .focus(), .focusin(), .focusout()
- .hover()
- .keydown(), .keypress(), .keyup()
- .load()
- .mouseenter(), .mouseleave()
- .mousemove(), .mouseout(),.mouseover(), .mousedown(), .mouseup()
- .ready()
- .resize()
- .scroll()
- .select()
- .submit()
- .toggle() – different than hide/show
- .unload()

Event object

- jQuery always passes the event object as the first argument to the handler.
  - ```
    $('html')
    .click(function(eventObject){
        console.log(eventObject);
        // inspect the object in the browser
    });
    ```
    ```

Event handlers - deprecated

- **Deprecated** in 1.8 (check with Migrate)
- .**toggle**(function1( ) { }, function2( ) { }, …)
  - 1st click, 2nd click, 3rd click…
- same function name is still used for hide and show animation
  - .toggle(5000) – show/fade element over 5 seconds
  - .toggle(true) – show element

Event handlers - map

- If a map property matches the event registration method, it's an event handler.
- $('<img/>', {
  src: 'https://www.petfinder.com/wp-content/uploads/2012/11/142025007-petside-dog-dry-nose-sick-632x475.jpg',
  alt: 'dog',
  class: 'translucentBox',
  click: function( ) { $(this).css('opacity', '.50'); } });

Demo

- Add 8 dog pictures 250px wide. Click each one to test.
- $('<img/>', {**src**:'find one on Google',
  alt:'dog',
  title: 'good dog',
  style: 'float:right; width:250px',
  click: function(e){ $(this).css('opacity', '.50');}})
  .appendTo($('body'))

Event propagation

- Event objects generated by an event will 'bubble up' to the parent element
  - event objects are not consumed
- A parent div can handle any child element's event object.
  - ask the event object for what element got the click
  - $('#parent').click(function(e) {
    - console.log(e.toElement.id);
  - });

Event propagation

- HTML
  - <div id=’parent'>
    - <div id=’child1'> Click child 1!
    - <div id=’child2'> Click child 2!
  -
- jQuery
  - $('div').click(function(e) {
    - alert('Hello from ' + $(this).attr('id'));
    - **e.stopPropagation( ); // will not send event to parent**
  - });

Event delegation optimization

- A normal 1.7 bind -
  - $('table').find('td').on('click',function( ) { $(this).toggleClass('active'); });
- If table has 100 cells, we have 100 event listeners!
- Better is one event listener – for any td of the table
  - $('table').on('click','td',function( ) { $(this).toggleClass('active'); });

no delegation	`$('table').find('td').on('click', function() {`
	`  $(this).toggleClass('active');`
	`});`
		1,421
		±9.53%
		93%
		slower

with delegation	`$('table').on('click', 'td', function() {`
	`  $(this).toggleClass('active');`
	`});`
		19,438
		±8.81%
		fastest

Prevent default event actions

- Clicking on a link creates a click event.
- Stop the click event with
  - $('a').click(function(e) {
    - e.preventDefault(); // will send event to parent
    - // do our event action stuff
    - url = $(this).attr('href');
    - window.location = url;
  - });

return false;

- Put at end of function
- does 3 things:
  - event.preventDefault()
    - all you need to cancel behavior
  - event.stopPropagation()
    - stop bubbling
  - stopImmediatePropagation( )
    - stops any further event execution, even to other handlers bound on the same object

`/events/*.html`
`/migrate/*.html`

Exercises

- Show an alert for chained selectors
- On click, add a class to span elements
- On hover, change a class

- Check out migrate examples if you have time.

DOM manipulation

Attributes

- .**addClass**( ) – creates a class attribute
  - .removeClass( )
  - .toggleClass( ) – adds and removes
- .**attr**( ) – creates/reads any attribute

- .**css**( ) – creates a style attribute, used for testing

.addClass( )

- addClass (**className …**)
  - $('div').addClass('className');
  - $('div').addClass('className1 className2 className3');
- Table with alternating row colors
  - **CSS**
    - .contrastingGrays { background-color: #dddddd; color: #666666; }
  - **jQuery**:
    - $('#celebs tr:even').addClass('contrastingGrays');

.removeClass( )

- removeClass(**className**)
  - $('div').removeClass('className');

- check for class with .hasClass(**className**)

.toggleClass( )

- same as
  - $el.hasClass(**className**)
    ? $el.removeClass(**className**)
    : $el.addClass (**className**)
- CSS
  - . bgLemonchiffon { background-color: #FFFACD; }
- jQuery
  - $('#celebs tr').**hover**(function() {
    $(this).**toggleClass**('bgLemonchiffon');
    });

.text( )

- **Get** text node value
  - $('h2:first').**text**( )
  - Returns string of concatenated body results
  - Strips all tags
- **Set** the text node
  - $('p').**text**('set text to this');

.text( ) vs. .html( )

- Two methods to **set** body of element
  - $(**selection**).**html**(**text**) – text will be rendered as if source
    - Use to remove current element body and add marked up text
  - $(**selection**).**text**(**text**) – text will be rendered as if in a <pre> (as-is)
    - Use to remove current body and add text
- html( ) is best overall

.attr( )

- get or set any attribute of an element
  - HTML
    -
      Once there was a large dinosaur...

      The title of the emphasis is:
  - jQuery
    - var title = $('em').attr('title');
      $('#titleText').html(title);

.attr( )

- add
  - $('#greatphoto').attr('title', 'Photo by Kelly Clark');
- change
  - $('#greatphoto').attr('alt', 'Beijing Brush Seller');
- multiple attributes using map
  - $('#greatphoto').attr(
    { alt: 'Beijing Brush Seller',
    title: 'photo by Kelly Clark' }
    );

id

- The attribute id can be retrieved in JavaScript by the field id
  - <section id='topOfPage'>
  - $('section').attr('id')
  - $('section')[0].id
  - document.querySelector('section').id

.css(property) - get

- <table id='celebs'><tbody>
  <tr style='**font-size:12px**'>

- var fontSize = $('#celebs tr:first')
  .**css**('font-size');

.css(property, value) - set

- $('#celebs tr:even')
  .**css**('background-color','#dddddd');

- Second argument causes an assignment
  - .css({ }) – use a map for multiple key-values

Create an element

- Create and select a fragment with $( )
  - var $p = **$(**' A new paragraph! '**)**;
- Add a class to the fragment
  - $(' A new paragraph! ')
    .**addClass**('new');
  - or
  - $p.addClass('new');
  - or
  - var $p = $(' ')
    .html('A new paragraph')
    .addClass('new');

Add/move element – as child

- inside of target ← content
  - < div id='disclaimer' >
  - $(' #disclaimer ').**prepend**('… content …');
    - text and elements inside div
  - $(' #disclaimer ').**append**('… content …')
    - </ div>
- content → inside of target
  - < div id='disclaimer' >
  - $('… content …').**prependTo**('#disclaimer');
    - text and elements inside div
  - $('… content …').**appendTo**('#disclaimer');
    - </ div>

Add/move element – as sibling

- no need to remove before inserting if relocating
- outside of target ← content
  - $(' #disclaimer ').**before**('… content …');
  - < div id='disclaimer' />
  - $(' #disclaimer ').**after**('… content …');
- content → outside of target
  - $('… content …').**insertBefore**('#disclaimer');
  - < div id='disclaimer' />
  - $('… content …').**insertAfter**('#disclaimer');

clone( )

- var $p = $('<p/>');
  - var $template = $(‘template#a’);
- $p.appendTo('body') - inserts $p
- $p.after('h1') - moves $p after inserted
- $p.clone().after('h1') - adds a copy, no events
- $p.**clone(true)**.after('h1') - adds a copy with events - best
- $p.clone(true).html(‘new headline’).after('h1')

.wrap( ), unwrap( )

- wrapAll('<p id='wrap'>') - wraps each selected element
- wrapInner ('<p id='wrap'>') - wraps contents of each selected element
- unwrap( ) removes parent

.remove( )

- HTML
  - We recommend that you have JavaScript enabled!
- jQuery
  - $('#no-script').**remove**();
  - $('#celebs tr').**remove**(':contains('Singer')');
    - where the row contains the text 'Singer'

.empty( ), .detach( )

- **empty**( ) removes children elements and text nodes but leaves element
- **detach**() method works just like remove() but does not remove event handlers and custom data
  - useful for a temporary removal

Demo

- Choose a site
- Change an image
- Change some text

DOM manipulation optimization

- DOM change = repaint + reflow
- Append an li to the DOM in a loop (bad)
  - var arr = [reallyLongArrayOfImageURLs];
  - $.each(arr, function(count, item) {
    var newImg = '<li><img src=' + item +' ></li>';
    $('#imgList').**append**(newImg);
    // render again
    });

DOM manipulation optimization

- This code appends once outside the loop (good)
  - var arr = [reallyLongArrayOfImageURLs], tmp = ‘’;
  - $.each(arr, function(count, item) {
    tmp += '<li><img src=' + item + ' ></li>';
    });
  - $('#imgList').**append**(tmp); // render once

`/dom/*.html`
`/migrate/*.html`

Exercises

- Append text to an element
- Create a striped table with hover highlighting

- Run and review the migrate examples
  - Read the console messages
  - Also, run without the migrate code

JavaScript syntax

Operators

- Is equal to == and ===
  - JavaScript has two equality operators
  - Best practice: use === always

Operators

- the modulus operator
  - 5 mod 2 is written 5 % 2
  - it means subtract as many 2s as possible and return the remainder
  - helpful for paging and loops
- compound operators
  - var x = 1;
  - x **+=** 5 means add 5 to the value of x
  - x = x + 5;
  - x **-=** 5 means subtract 5 from the value of x
  - x = x – 5;

JSON format

- How to create an object
- {

  key: value,

  key: value,

  key: value
- }
- also called a map
- var properties = {'alt':'dog', style:'width:250px'};

Animation effects

.hide( )

- Create a button and text to hide
  - <input id='**hideButton**' type='button' value='hide text' />
  - …
- $('#**hideButton**').on('click',function( ) {
  $('#**disclaimer**').**hide**( );
  });
- Or hide the selection itself with **this**
  - $('#hideButton').on('click',function( ) {
    $(**this**).hide( );
    });

.show( )

- to show hidden elements
  - <input type='button' id='**showButton**' value='show' />
- $('#**showButton**')
  .**on**(‘click’,function( ) {
  - $('#disclaimer').**show**( );
- });

.hide( ) / .show( ) options

- show([duration][, easing][, callback])
  - Duration
    - Default – 400ms
    - 'slow‘ – 600ms
    - 'fast‘ – 200ms
    - # of ms – 1000, 2000, 8000, etc.
  - easing = 'linear', '**swing**'
  - callback – function to run when done (synchronous call)

.toggle( )

- animated insert, animated remove
- hide( ) & show( )
  - Old school – use **if** to see if it's visible, then modify
- HTML
  - <input type='button' id=' **toggleButton**' value='show' />
- jQuery
  - $('#**toggleButton** ')
    .on('click', function( ) { $('#disclaimer').**toggle**( );
    });

.toggle( )

- hide( ) = toggle(false)
- show( ) = toggle(true)

Fade methods

- fadeIn([duration][,easing][, callback])
- fadeOut([duration][,easing][, callback])

- fadeTo(duration, opacity [,easing][, callback])
  - opacity - between 0 and 1
- fadeTo(0, opacity) = css('opacity', opacity).

- fade with easing, collapse is sudden

Hide & fade in with prompt

- Hide any element with a spoiler class
  - $('.spoiler').hide( );
- Put a teaser element before any spoiler element
  - $('Tell me!') .insertBefore('.spoiler');

Hide & fade in with prompt

- Bind any teaser on click to hide, and then fade the next sibling in (spoiler)
  - ```
    $('.revealer').click(function() {
      $(this).hide();
      $(this).next().fadeIn();
    });
    ```
    ```

Arguments in map

- .fadeIn({
  - **duration**: 'fast',
  - **easing**: 'swing',
  - **complete**: function( ){
    $(this).text('Hello World');
    }
- });

.fadeToggle( ) 1.4.4

- abrupt insert, fade, abrupt remove
- .fadeToggle([duration] [, easing] [, callback])
- $('button:last').click(function ( ) {
  $('p:last').fadeToggle('fast', function ( ) {
  $('#log').append(' finished ');
  });
  });

Slide effects

- slideDown([speed][,callback]);
- slideUp([speed][,callback]);
- slideToggle([speed][,callback]);
  - $(selection).slideToggle('slow', **function( ) { alert('Done!'); }**);
  - $(selection).slideToggle('slow', **doAfterToggle**);

Chaining effects

- Unchained and concurrent (asynch)
  - $('p:first').**show**(5000);
  - $('p:first').**slideDown**('slow');
  - $('p:first').**fadeOut**( );
- Chained and queued (synch)
  - $('p:first')
.**show**(5000)
.**slideDown**('slow')
.**fadeOut**( );

Chaining effects

- $('#blinker')
  .fadeIn(100).fadeOut(100)
  .fadeIn(100).fadeOut(100) .fadeIn( );

delay( )

- delay(duration [, queueName])
- Adds a pause
  - $('p:first').hide( ).slideDown('slow').**delay**(2000).fadeOut( );
- queueName defaults to fx, the standard effects queue

True cross-fading

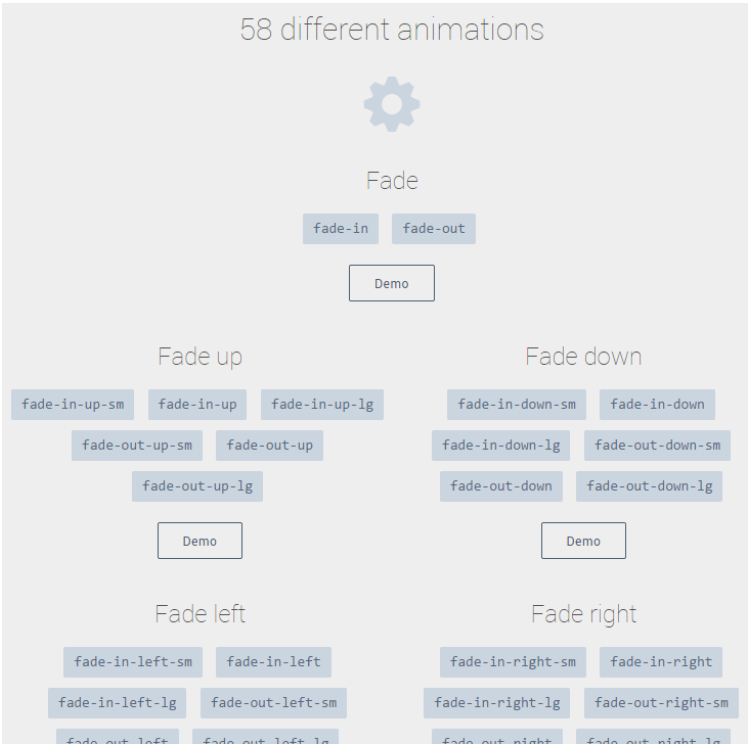
- Use CSS' z-index or the ordered stack of elements
  - requires same size images

Plugins - effects

- **InnerFade** - http://medienfreunde.com/lab/innerfade/
  - allows multiple images or blocks to cycle cross-fade or slide
- Zoom & WheelZoom
  - http://www.jacklmoore.com
  - hover / mousedown / mouse wheel to zoom image
- Transit - use CSS effects instead (smoother)
  - http://ricostacruz.com/jquery.transit

Page transitions - plugins

- Animsition
  - http://git.blivesta.com/animsition/



/animation/*.html

Exercises

- Toggle text visibility
- InnerFade with images

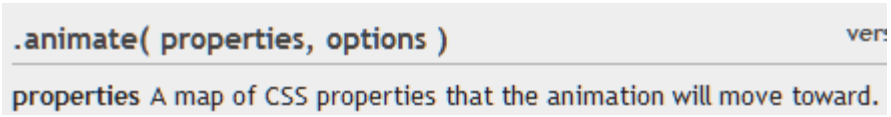
More Animation

Easing

- Acceleration and deceleration like under gravity or using rubber band stretching.
- Typically follows duration as an option.
- Default = 'swing'
  - 'linear' is boring.
- Show difference
  - ```
    $('p:first').toggle(
      function() { $(this).animate({height :'+=150px'}, 1000, 'linear'); },
      function() { $(this).animate({height :'-=150px'},  1000, 'swing'); }
    );
    ```
    ```

.animate( )

- gradual transition to CSS properties defined in an object literal
- Object literal
  - { **key: value , key: value, …** }
  - { opacity: 0.25, left: '+=50', height: 'toggle' }
  - { padding: '20px', ‘border-bottom’: '3px solid #8f8f8f', borderRight: '3px solid #bfbfbf' }



animate( )

- Two syntaxes
  - $(this).animate({ height: '-=350px' }, 3000, 'swing');
  - $(this).animate({ height: '-=350px' },
    - { duration: 3000, easing: 'swing' }
  -);
- Options allows for more keys such as queue
  - **queue**: false
    - doesn't wait for previous animation effect to complete

animate( )

- $(selection).animate(
  map,
  [duration], [easing]);
- $('p').animate(
  { padding: '20px',
    borderBottom: '3px solid #8f8f8f',
    borderRight: '3px solid #bfbfbf'
  },
  2000);

Color animation

- due to color complexity, requires jQuery UI
  - $('.block').toggle(
  - function( ) {
    $(this).animate({ backgroundColor: 'black' }, 1000); },
  - function() {
    $(this).animate({ backgroundColor: '#68BFEF' } , 500); });

stop( )

- .**stop**([clearQueue][,goToEnd])
  - clearQueue when true stops any currently running animations before moving on
  - goToEnd when true will cause animation to immediately complete calling callback
- typical use is menu dropdowns

effect( ) - jQuery UI

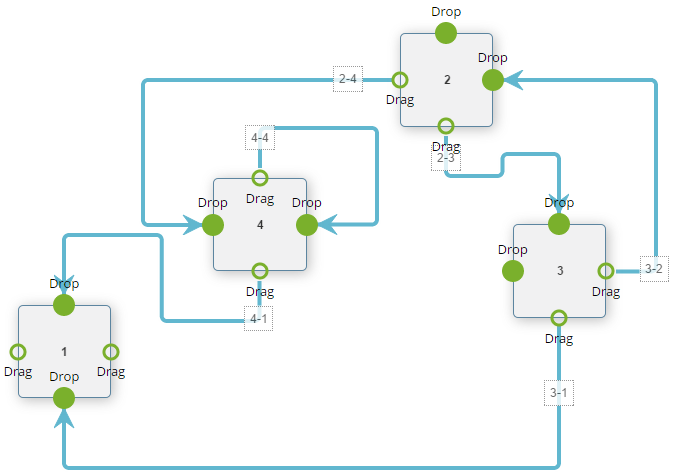
- Used with Show/Hide/Toggle
  - Blind, Clip, Drop, Explode, Fade, Fold, Puff, Slide, Scale
- Standalone effects
  - Bounce, Highlight, Pulsate, Shake, Size, Transfer
- $('p:first')
  .effect('shake', {times:3}, 300)
  .effect('highlight', { }, 3000)
  .hide('explode', { }, 1000);

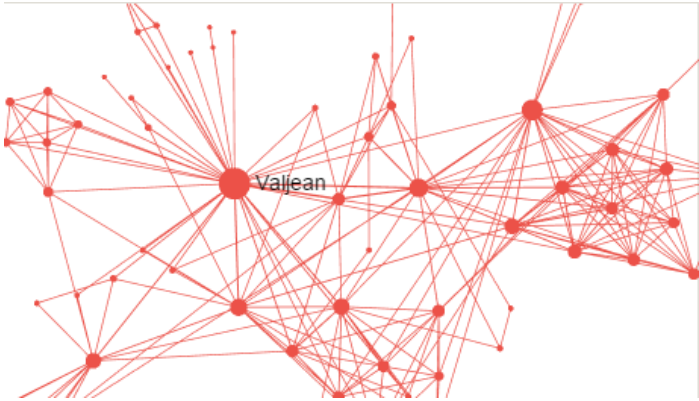
Plugins - animation

- Keyframes
  - http://farukat.es/journal/2011/02/514-new-creation-jquery-runloop-plugin
  - **Sequence** - http://www.sequencejs.com/
- Smart3D
  - http://4coder.info/proekty/jquery-plaginy/jquery-smart3d/
- Transit - animate replacement
  - http://ricostacruz.com/jquery.transit/
- Adipoli - hover transitions
  - http://jobyj.in/adipoli/
- **Velocity.js** - animate( ) replacement
  - http://julian.com/research/velocity/

Data display - plugins

- Elycharts - http://elycharts.com
- Flot – http://flotcharts.org
- jsPlumb
  - https://jsplumbtoolkit.com/
- Sigma.js - networks
  - http://sigmajs.org/





Exercises

- Animate the addition of CSS on load
- Find and set CSS based on window size

Scrolling and resizing

Scrolling

- Detect user's scrolling with **scroll**( ) event
  - divs or windows
- CSS to simulate a scrolling div
  - #news { height: 100px; width: 300px; overflow: scroll; }
- jQuery event handler
  - $('#news').on('scroll', function(e) { … });
  - $('#news').scroll(function(e) { … });

Floating navigation

- Movable menu CSS
  - position: relative
  - top: adjusted by jQuery based on how much is scrolled
    - $(window).scroll(function( ) { $('#navigation').css('top', $(document).scrollTop(…)); });
- .scrollTop( ) – vertical position of 1st scrollbar (how much is hidden in pixels)
- position: fixed will do same thing without easing

Floating navigation

- Final version
  - $(window).on(‘scroll’, function( ) {
  - $('#navigation')
  - .stop()
  - .animate({ top: $(document).scrollTop( ) },
    'slow' ,
    'easeOutBack');
  - });

Scrolling the document

- Adding animation to <a href='#'>Go to top</a>
  - $('a[href=#]').on('click',function(e) {
    $('html').animate({scrollTop: 0},'slow');
    e.preventDefault();
    }
- '**a[href=#]**' – attribute selector
  - select all links where the href attribute equals #
- **preventDefault()** or **return false;** at end of function for event handler to stop event's default behavior

Demo

- $(window).scroll(function(){
  - var newColor = 'hsl(' + $(this).scrollTop() % 360 +', 50%, 50%)';
    console.log(newColor);
  - $('body')
    .css('background-color', newColor);
- });

Plugins - scrolling

- **ScrollTo**
  - http://flesler.blogspot.com/2007/10/jqueryscrollto.html
- Other
  - ***ScrollMagic**– supports parallax effects http://janpaepke.github.io/ScrollMagic/
  - **jParallax** - http://stephband.info/jparallax/
  - **(Almost) Static Background** - http://johnpolacek.github.com/scrolldeck.js/decks/parallax
  - **Scrollpath** - http://joelb.me/scrollpath/

Plugins - scrolling

- Mouse wheel support
  - left out of jQuery on purpose, add it back in if needed
  - http://plugins.jquery.com/project/mousewheel
- Inifinite / Endless Scroll
  - https://github.com/fredwu/jquery-endless-scroll/tree/2.0-rewrite
  - Waypoints (show on bottom, detect when seen, dial controls) http://imakewebthings.github.com/jquery-waypoints/
  - http://www.infinite-scroll.com/infinite-scroll-jquery-plugin/

Resizing

- Detect user's resizing with **resize**( ) event
  - for document views
- Demo code
  - $(window).on('resize', function( ) {
    alert('You resized the window!');
    });
- Dangerous
  - like scrolling, resizing fires events for every little change
  - used for monitoring

Resizing

- Fluid or fixed width?
- Responsive design – adaptive layouts
  - http://www.lifeonlars.com/design/web-design/responsive-web-design-adaptive-layouts-with-media-queries
- Check current width
  - if ($('body').**width**( ) > 900) {
    $('<link rel='stylesheet' href='wide.css' type='text/css' />') .appendTo('head');
    } else {
    $('link[href=wide.css]').remove( );
    }

Resizing – current state

- Browsers are confused about the visual viewport.
- Browsers agree the resize event should be fired when the dimensions of the visual viewport, the layout viewport, or the HTML element change.
- Slightly more than half of browsers fire a resize event when the HTML element's dimensions change.
  - Only Android up to 2.3 and BlackBerry fire the event in all tested cases.
  - Android 3.2 is worse in firing event than 2.3.
  - Does not work at all in Opera Mobile.

Plugins

- Responsive design
  - Restive - https://github.com/obihill/restive-plugin
- Centering
  - Centr - http://boeddo.com/centr

Exercises

- Shake and slide
- Floating navigation

jQuery UI

Check if loaded

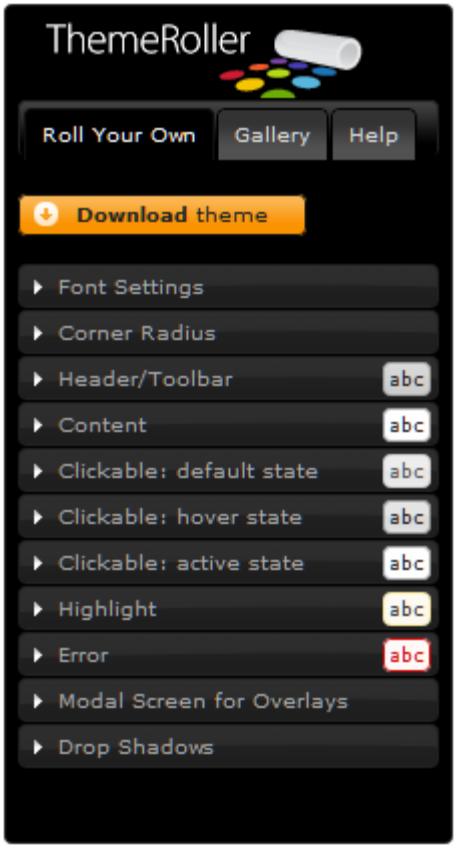
- in the console type
  - `jQuery.ui`
  - `$.ui`
- undefined = no
- Object { … } = yes

ThemeRoller

- jQuery UI rewrites the all UI elements with classes using ThemeRoller CSS
- Choose Themes on the jQuery UI menu
  - Select a theme from the Gallery
  - Use the CSS

Theme rolling

- http://jqueryui.com/themeroller/
- Gallery
  - Default – lightness theme



Using themes

- Wrapper div: class='ui-widget'
  - class ui-helper-reset can be replaced with another reset
- Docs - http://jqueryui.com/docs/Theming/API
- Class categories
  - layout helpers
  - widget containers – header, content
  - interaction states
  - icons
  - corner radius helpers
  - overlay & shadow

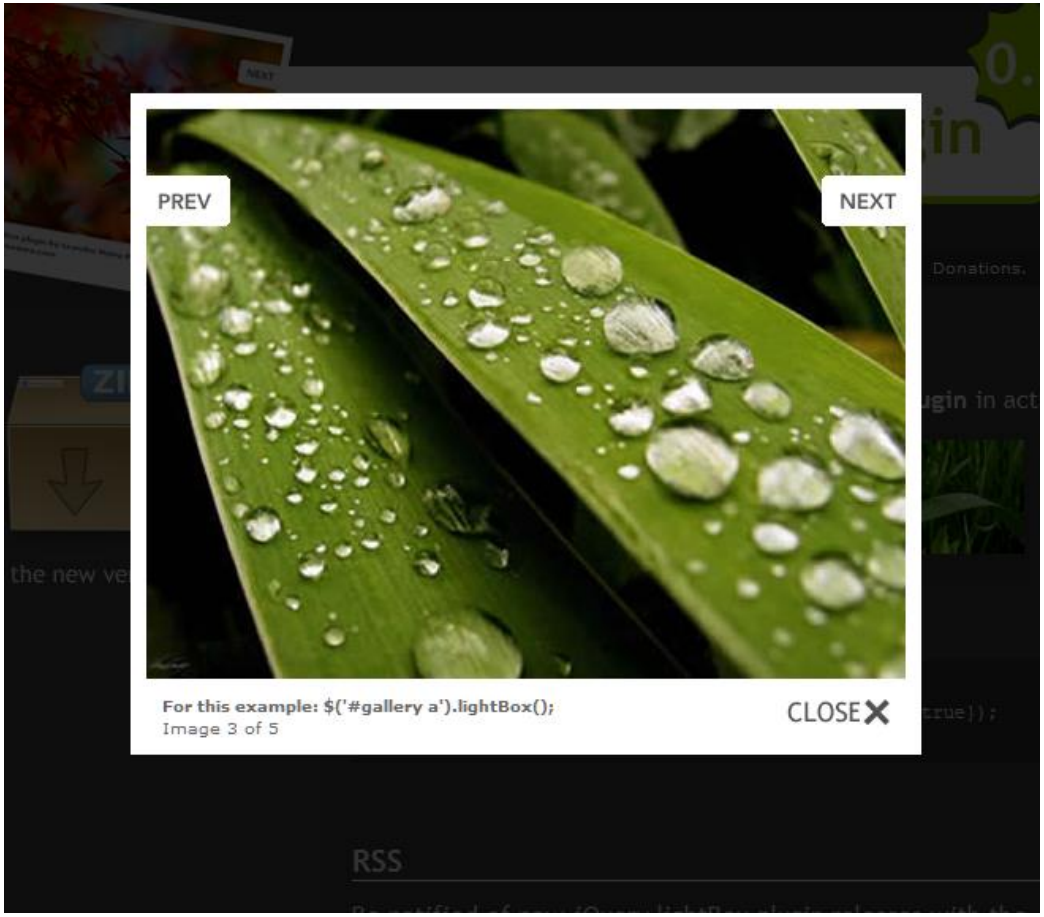
Exercise

- Follow instructions in Exercises handout for
  - Create an html template for ThemeRoller

Image plugins

Lightboxes

- Click thumbnail image, show full-size image in modal dialog
- Linkable text in captions.
- Slideshows are automatic advancing.

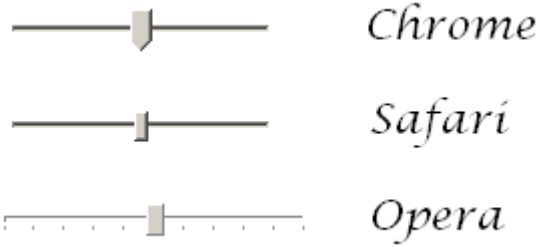


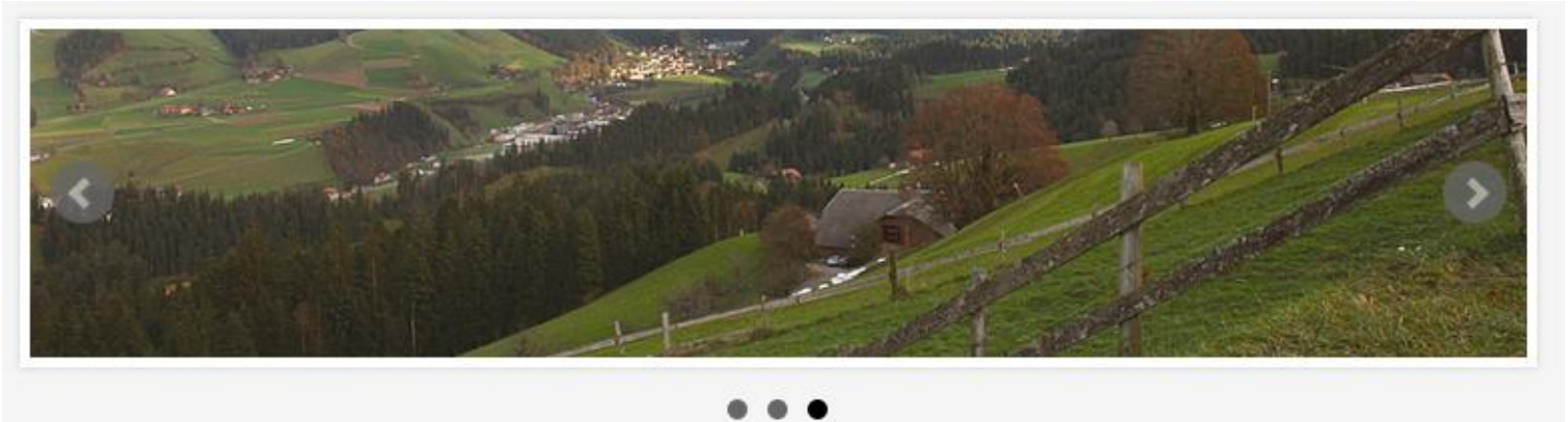
Carousels

- Lightbox with features
- Filmstrip of coming images at bottom

Sliders

- Not the same as a slider control
- Large image, right & left navigation buttons, extra CSS
- Most popular plugin on home pages





Plugins - images

- **Flexslider** – slider / carousel
  - http://flexslider.woothemes.com/
- **Cycle** - slider
  - http://malsup.com/jquery/cycle/
  - effects, speed, timeout, random, pause on hover, easing, delay, syncing, event handling, paging, callbacks

Exercise

- Follow instructions in Exercises handout for
  - Colorbox plugin
  - Rollover images
  - Cycle plugin

Menus, tabs, panels, dialogs & tooltips

Menus

- Expandable / collapsible
  - Use <nav> as a container
  - typically unordered lists with CSS styles
- CSS only
  - Listamatic 1 & 2, Listutorial –
  - http://css.maxdesign.com.au/listamatic/
  - http://css.maxdesign.com.au/listutorial/
- jQueryUI widget is basic
- needs delay for mouseout event

Menus - html

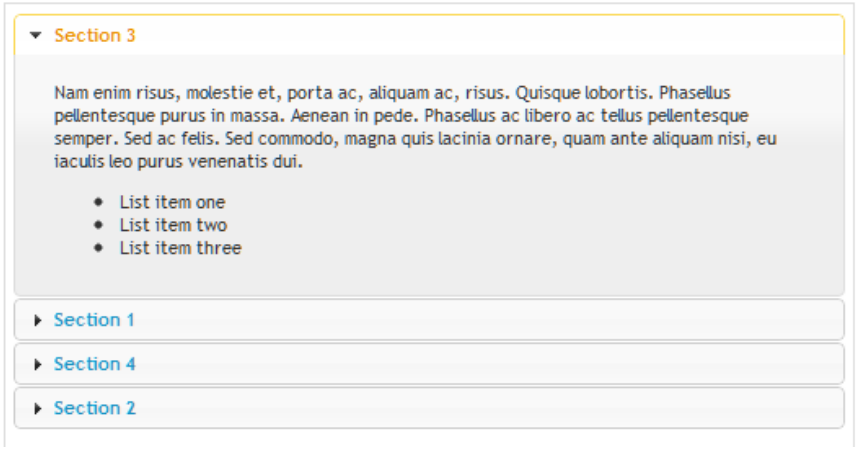
- $('#menu').menu();
- <ul id='menu'>
  - <li class='ui-state-disabled'><a href='#'>Aberdeen</a></li>
  - <li><a href='#'>Delphi</a>
    - <ul>... for nested menu ...
  - </li>

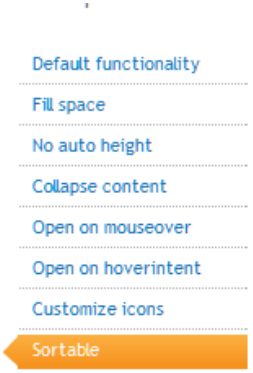
Menus - plugins

- **Superfish** - Suckerfish style
  - http://users.tpg.com.au/j_birch/plugins/superfish
- **Hover Intent** - UI for menus
  - http://cherne.net/brian/resources/jquery.hoverIntent.html
  - notes the speed of the cursor and only fires a hover if the cursor has slowed down enough

Accordion

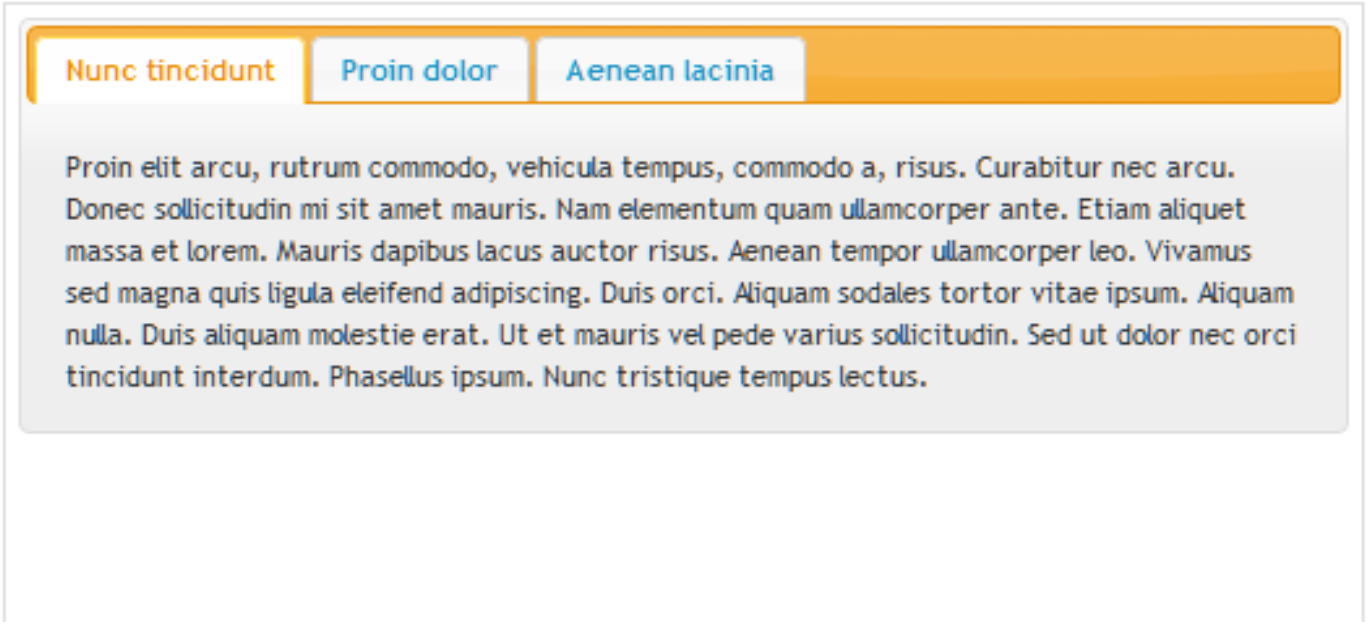
- Can use any containers
  - hide contents of all containers
  - show contents of active container
- Multiple levels
  - selectors use child selectors





Tabs

- Panels with buttons on top
- One panel visible at a time



Tabs - plugins

- EasyTabs.js
  - http://os.alfajango.com/easytabs/

Panels and panes

- Container visually on top of another container
  - log-in form
  - email collection
  - quick survey
  - disclaimer
- Container under panel is usually visually subdued (faded, blurred, darkened)

Panels and panes

- Notifications - Temporary small panels
- Dialogs – panels with buttons
- Modal – does not allow you to work with container under this panel

Dialog - jQuery UI

- HTML button
  - <button id='btn_openDialog'>Hated it!</button>
- HTML dialog
  -
    You've assigned the current celebrity a bad rating.
    Perhaps you'd like to think this over./p>

Dialog - jQuery UI

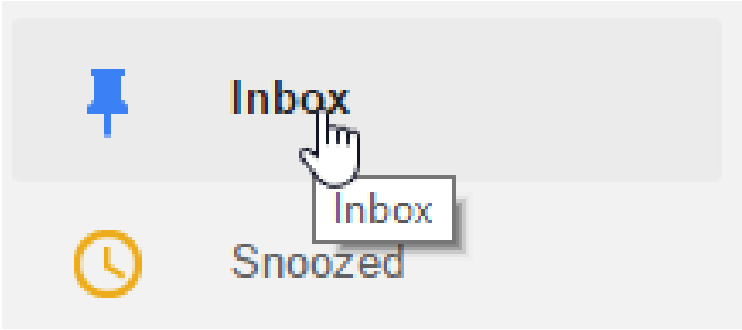
- $('#**div_dialog**').dialog({
  autoOpen: false, **height**: 350,
  modal: true, **resizable**: true,
  buttons: {
  'Continue': function ( ) {
  $(this).dialog('close'); submitRating( ); },
  'Change Rating': function ( ) {
  $(this).dialog('close'); updateRating( ); }
  }
  });

Dialog - jQuery UI

- jQuery code to open dialog
  - $('#btn_openDialog').button( )
    .on('click',function ( ) {
      $('#**div_dialog**').dialog('open');
    });

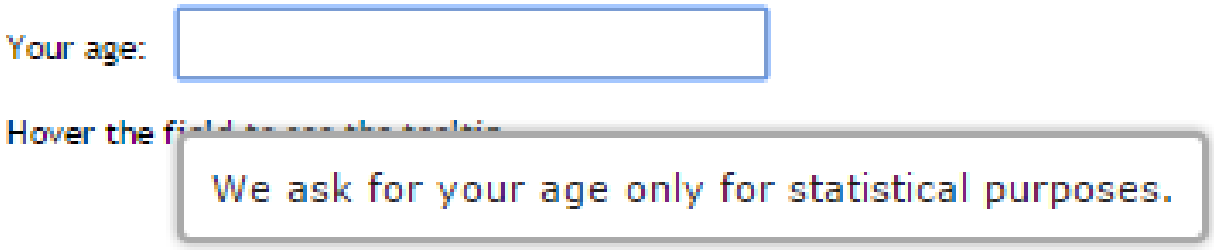
Tooltips

- Small temporary non-modal dialog triggered when hovering over element
  - Default browser behavior on links with **title** attributes



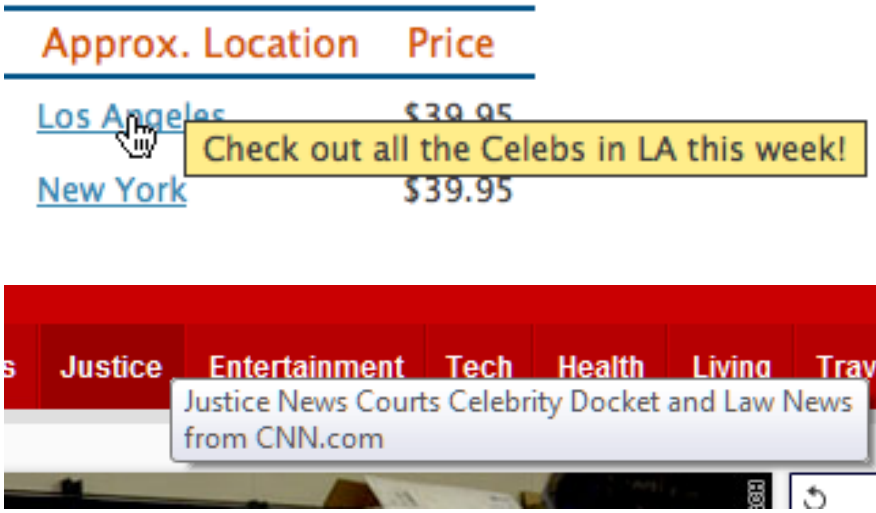
Tooltips - jQueryUI

- $(document).tooltip({
  - show: { effect: 'slideDown', delay: 250 }
- });
- title='We ask for your age only for statistical purposes.'



Tooltips - plugins

- http://www.1stwebdesigner.com/css/stylish-jquery-tooltip-plugins-webdesign/
- Grumble - http://jamescryer.github.com/grum
- http://craigsworks.com/projects/qtip2/



Panels - plugins

- Growl-style notifications
  - Gritter
    - http://boedesign.com/demos/gritter/
  - Toastr
    - http://codeseven.github.io/toastr/demo.htm
  - Toastr with FontAwesome icons
    - http://plnkr.co/edit/6W9URNyyp2ItO4aUWzBB?p=preview

/menus/linkStyleOnOwnPage.html

Exercises

- Follow instructions in Exercises handout for
  - Change a link style when on its own page

Forms

Forms

- Simple form validation
  - Don't trust your users
  - Don't only use jQuery to validate the data
- jQuery with forms should be used for
  - assisting input
  - validation of simple data input mistakes and revalidated in server code when submitted

Form selectors

- :input
  - $('#myForm:input').css('background-color', 'lemonchiffon')
- :text, :password, :radio, :checkbox, :submit, :button,
  :image, :file
- :enabled, :disabled
- :checked, :selected

.val( )

- val( ), val(**string**)
  - Gets the value or
  - Sets the value of an input, select or textarea field
- $('select.foo option:selected').val( )
  - $('select.foo').val( ); // easier
- $('input:checkbox:checked').val( );
- $('input:radio[name=bar]:checked').val( )

.val( )

- val(**function(index, value)**)
- Use to calculate the value to set
- value = old value
- index = position of element in the array
- Always shows current value
  - html( ) will show original value even after user enters in new value

Simple validation scripts

- Highlight required text fields
  - $(':submit').on('click',function (e) {
  - $(':text').each(function () {
  - if (! $(this).val().trim()) { // not inputField's value withoutSpaces
  - $(this).css('border', '2px solid red');
  - e.preventDefault();
  - } else {
  - $(this).css('border', ' ');
  - }
  - });
  - });

Simple validation scripts

- Tell user when leaving empty required field
  - $(':input').**blur**(function() {
  - if (! $(this).**val**().trim()) {
  - $(this).addClass('error')
  - .after('This field must … ');
  - }
  - });
  - $(':input').focus(function() {
  - $(this).removeClass('error')
  - .next('span')
  - .remove();
  - });

Designing form validation

- Keep it simple.
  - Unless you plan it out well before
- Offer sample input and guidance
  - (mm-dd-yyyy)
  - a strong password uses a-z, A-Z and special characters

The submit event

- Better than the click event, don't forget the Enter key

```
$('form').on('submit', function( ) {
  var error = false;
  $(this).find(':text').each(function( ) {
    if (! $(this).val().trim()) {
      alert('Textboxes must have a value!');
      $(this).focus( );
      error = true;
      return false; // Exit this function
    }
  });
  if (error) { return false;  }
});
```

Form validation with a plugin

- Best - http://jqueryvalidation.org/
- Workflow
  - Download and/or declare script element
  - Build the form with ids & names for each input
    - name binds to success message
    - id binds to selectors if used
  - Write the $(**selector**).validate(…) function body
  - Write CSS for .error and .success

Form validation with a plugin

- <h2>Sign up</h2>
- <**form** action="">
- <label for='name'>Name:</label>
  <input name='**name**' id='name' type='text'/>
- <label for='email'>Email:</label>
  <input name='**email**' id='email' type='text'/>
- …
- <input type='submit' value='Submit!' />
- </form>

Form validation with a plugin

```
$('#signup form').validate({
  rules: {
    name: {required: true,},
    email: {required: true, email: true }, …
  success: function(label) {
    label.text('OK!').addClass('valid');
  }
});
```

Form validation with a plugin

- input.error
  - for highlighting the field to correct
- label.error
  - for the error message and/or graphic
- input.valid
  - for validated data in the field
- label.**goodjob**
  - for a 'good job!' message when adding the text & class in a success field of the validate( ) arguments

Validation predefined rules

- required, email, url, minlength, equalTo
- remote – for server side validation
- maxlength, rangelength, min, max, range
- date, dateISO, DateDE
- number, numberDE, digits
- creditcard, accept (file extension)
- minWords, maxWords, rangeWords
- phoneUS

Maximum length indicator

- Problem: show remaining characters in textarea
- keypress event handler
  - e.which - which key was pressed for event
  - backspace = 8
- Plugin
  - http://tpgblog.com/noblecount/

Checkbox state

- .attr('checked') is not correct
- .prop('checked')
  - or .is(':checked')
  - or :checked on element

Check all checkboxes

- When any checkbox.check-all is checked, change all check boxes.
- $('.check-all:checkbox').change(function( ) {
  var group = ':checkbox[name='
  + $(this).attr('name')
  + ']';
  $(group). prop('checked', $(this).
prop('checked'));
});

Inline editing

- Two workflows
  - Fake the style of the field
    - make fields look like label/p/div
    - when user clicks on one, style it back as a field
  - Replacing text with input element
    - when user click on label/p/div
    - replace field with input fields
- Expectations of spreadsheet style entry
- http://www.appelsiini.net/projects/jeditable/default.html

Star ratings - plugins

- Rate Yo!
  - http://prrashi.github.io/rateYo/
  - SVG, no images

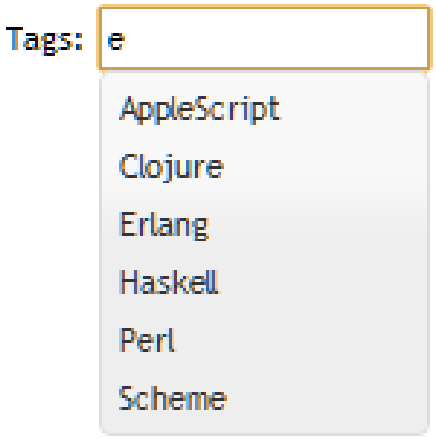
- Star Rating plugin
  - http://www.fyneworks.com/jquery/star-rating/
- Raty
  - http://www.wbotelhos.com/raty/

Slider - jQuery UI

- Based on **select** + **option**s elements
- var max = $('#max').val( ); var min = $('#min').val( );
- var rangeSlider = $(' ')
- .slider({ **min**: 0, **max**: 100, **step**: 10, **values**: [min, max], **range**: true,
  animate: true,
- slide: function(e,ui) {
- $('#min').val(ui.values[0]);
- $('#max').val(ui.values[1]);
- showCelebs();
- } })
- .before('<h3>Drag the slider to filter by price:</h3>');
- $('#price-range').after(rangeSlider).hide( );

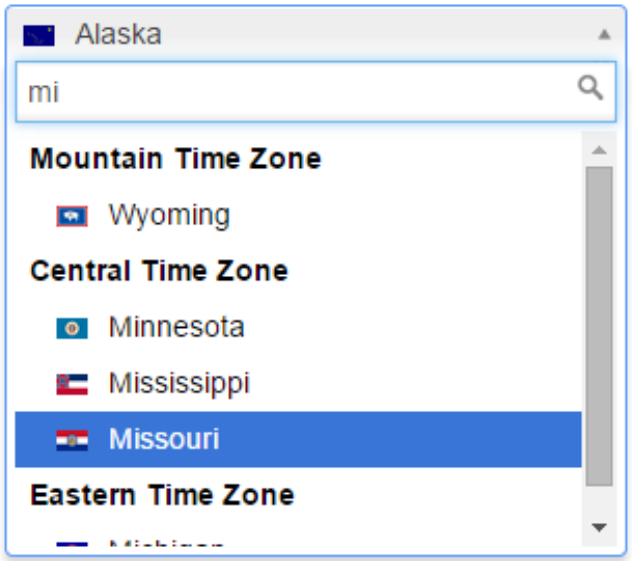
Select box - jQuery UI

- Autocomplete
- <input id='tags'>
- var availableTags = ['ActionScript', 'AppleScript', 'Asp', 'BASIC', 'C', 'C++', 'Clojure', 'COBOL', 'ColdFusion', 'Erlang', 'Fortran', 'Groovy', 'Haskell', 'Java', 'JavaScript', 'Lisp', 'Perl', 'PHP', 'Python', 'Ruby', 'Scala', 'Scheme'];
- $('#tags').autocomplete({ source: availableTags });



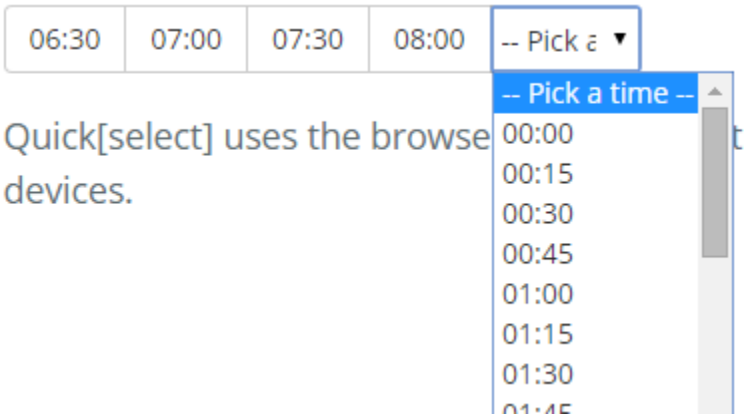
Select box - plugin

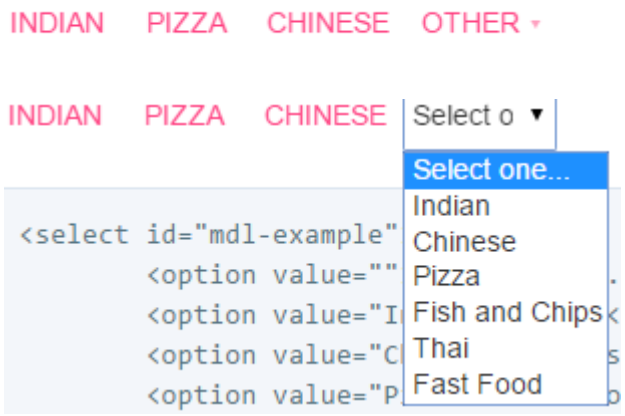
- ***Select2** v4
  - https://select2.github.io/
  - Searchable options
  - Multiple options
  - Autocomplete
  - Infinite scrolling
  - Tagging
- Chosen
  - http://harvesthq.github.io/chosen/



Select box with common options

- Quick[select]
  - http://eggboxio.github.io/quick-select/





Tagging - plugin

- Tags Input , Selectize
- *Bootstrap tags input
  - http://timschlechter.github.io/bootstrap-tagsinput/examples/
  - Type and delimit, requires some autocomplete
- Tag-it

  - Type and delimit, with autocomplete (requires jQuery UI)
  - http://aehlke.github.io/tag-it/
- TagBox

  - http://www.geektantra.com/2011/05/jquery-tagbox-plugin/
  - Type and confirm, no autocomplete

Autocomplete

- Typeahead.js
  - http://twitter.github.io/typeahead.js/
  - Better than the bootstrap typeahead (deprecated)
- Ajax AutoComplete
  - https://www.devbridge.com/sourcery/components/jquery-autocomplete/

Button - jQuery UI

- $('input:submit, a, button, input[type=button]', '.demo').button();
-
  - <button>A button element</button>
  - <input type='submit' value='A submit button'>
  - <a href='#'>An anchor</a>
-

Plugins - forms

- Chosen (better drop down menus)
  - http://harvesthq.github.com/chosen/
- Drop downs (select boxes) - searching, remote data sets, and infinite scrolling
  - http://ivaynberg.github.com/select2/
- Ideal Forms
  - http://jqidealforms.com/

Plugins - forms

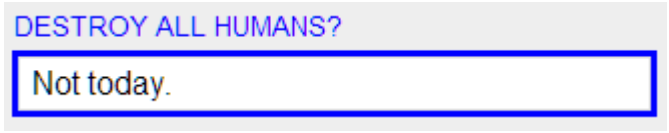
- http://fuelyourcoding.com/scripts/infield/
- http://digitalbush.com/projects/masked-input-plugin/
- http://www.jquery4u.com/plugins/8-jquery-form-label-html5-placeholder-plugins/
- http://jquery.kuzemchak.net/toggleval.php

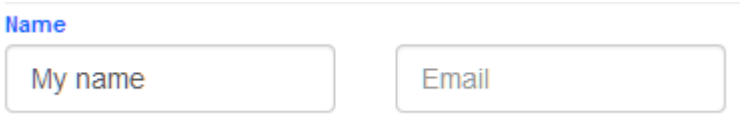
Plugins - forms

- Textarea
  - Autosize - http://www.jacklmoore.com/autosize
    - adjusts size as you type
- Clone
  - Cloneya - http://yapapaya.github.io/jquery-cloneya

Plugins - forms

- float label pattern
  - Flylabel.js (above)
    - http://athaeryn.github.io/flyLabel.js
  - Floatlabels.js (inside)
    - http://clubdesign.github.io/floatlabels.js/
  - JvFloat.js
    - http://bootsnipp.com/iframe/Ov





Exercise

- Form event testing
- Look at **props-vs-attr.html** for a visual display of why you don’t use attributes for checkbox state testing
- Look at **checkboxes.html** for a generated set of checkboxes from data.

The common term for XHR

AJAX

AJAX crash course

- old school request for some new data
  - dump the current page and ask the HTTP server for a new page
  - get rid of any user entered data on the current page unless you program it to stay
- AJAX request for some new data
  - sneak off while user is interacting with the page to ask any server via JSON/JSONP to get a little piece of data for you
  - update the part of the page you want to change

AJAX

- Talk via browser to update current page data
- Talk via browser to update server data
- Talk via browser to load scripts or other resources
- Talk via server side language to add to composed page

JSON

- a text data format
- JavaScript object declaration
- Converts into objects without mapping
  - { key: value, key2: value2, etc… }
  - values are data **or** functions

JSON conversions

- convert an object to text (for screen)
  - var JSONtext = JSON.stringify(anObject);
  - var partOfObject = anObject.bigpart.smallpart.data
- convert JSON text back to an object
  - var o = JSON.parse(JSONtext)

Load remote HTML

- Replace the contents of a container with a page body
  - $('div:first').load('test.html');
  - $('#temp').load('weather_report.html#temperature');
- From origin server only

Load with GET/POST

- GET request
  - uses a query string
  - $('#target').load(' **remotePage selector** ', '**query string**');
  - $('#temp').load('us_weather.html', 'zipcode=02134');
- POST request
  - $('#target').load(' **remotePage selector** ', **object**);
  - $('#temp').load('us_weather.html',
    - { zipcode:02134, units:'F' });

Load – filter by selector

- load page and filter with selector
  - $('#target').load(' **remotePage selector** ');
  - $('#biography').load('computadors.html div:first');
  - Use for pseudo-database access
- load and show message
  - $('#target').html('loading…').load(' **remotePage selector** ');

Fetching data

- When 3rd parties provide JSON methods (services), use
  - $.getJSON(**serviceURL** , **callback function**)
  - or
  - $.getJSON(**serviceURL** , **map for GET**, **callback function**)

JSONP

- COR – Cross Origin Request being used more.

- JSONP (with padding) format allows cross-domain requests a
  - callback=? appended to URL… but not always that key
- JSON sites without P
  - Set up server –side proxy

Delicious

- Base URL call
  - http://feeds.delicious.com/v2/json
  - retrieves bookmarks from hotlist
- Other calls
  - **base**/recent
  - **base**/tag
  - **base**/tag/**tag+tag+…**
  - **base**/popular
  - **base**/popular/**tag**
  - **base**/**username**

Delicious

```
$.getJSON('http://feeds.delicious.com/v2/json/tag/centriq?callback=?',
        function (data) {
            console.log(data);  // so you can drill down and see the data with F12
            $('body').append('<h2>Fetched ' + data.length + ' items!</h2>');
            $(data).each(function (index) {
                $('<a>',{
                    href: this.u,
                    text: this.d
                }) .hide( )
                .appendTo('body').fadeIn( ) ;
                $('body').append('<br/>');
            });
        });
```

Flickr

- Base URL call
  - http://api.flickr.com/services/feeds/photos_public.gne?jsoncallback=?
- Object map for GET
  - { tags: 'cat, grumpy', format: 'json' }

Flickr

```
var commaSeparatedSearchTags = 'cat, grumpy';
var flickrBase =
'http://api.flickr.com/services/feeds/photos_public.gne?jsoncallback=?';
$.getJSON(flickrBase, { tags: commaSeparatedSearchTags, format: 'json' },
function (data) {
        console.log(data);
        $('<h1>').text(data.title)
        .appendTo('body');
        $(data.items).each(function ( ) {
                $('<a>', {href: this.link}).append(
                 $('<img>', { src: this.media.m, style: 'height: 200px; padding:2px'
}))
                 .appendTo('body');
        });
});
```

The jQuery Ajax workhorse

- $.ajax({ });
- very customizable, all other Ajax functions wrap around this one

Common Ajax settings

- Reusable settings for multiple $.ajax( ) calls
- $.ajaxSetup ({ });

.ajax( ) for JSON

- $.ajax({ url: *url*, dataType: 'json', data: *data*, success: *callback* });
  - $.getJSON( ) is a shortcut
- Datatypes
  include xml, html, json, jsonp, script, or text.
- If the URL includes 'callback=?' requests are treated as JSONP

.ajax( ) error handling

- $.ajax({
  url: *url*,
  dataType: 'jsonp',
  data: *data*,
  timeout: 15000,
  success: *callback*,
  error: function( ) {
  $response.html(failed); }
  });

Loading external scripts

- $.getScript(**script URL**)
- delay loading code until necessary
- loads scripts from server as needed

GET and POST methods

- Shorthand methods of $.ajax( )
- $.get(**url, data, callback, dataType**);
- $.post(**url, data, callback, dataType**);

Links - Web services

- Get a Google API key
  - https://console.developers.google.com

Links - APIs

- http://www.programmableweb.com/apis/directory
- TwitStream plugin
  - http://iamnoahcooper.com/TwitStream/

Debugging AJAX

- http://fixingthesejquery.com/#slide33 and do rest of deck

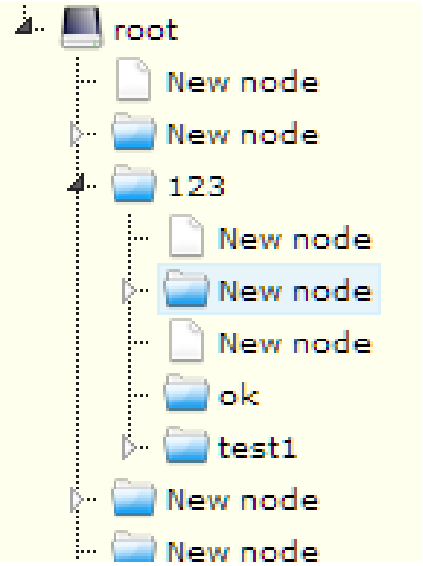
Exercise

- Copy and play with
  - flickr-grumpy-cats.html
  - google-translate.html

Lists, Trees, and Tables/Grids

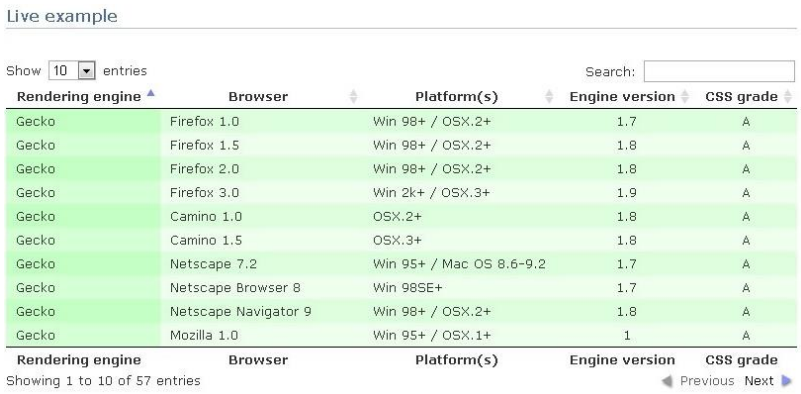
Plugins - trees

- jsTree - http://www.jstree.com/
  - theme support, search, AJAX, drag & drop…
- https://github.com/pioz/jquery-tree



Plugins - tables

- Front-end managed data display components
  - requires data feed from back end, usually a REST service
  - not needed if you are doing back-end extraction and sorting
- Targeted towards the desktop
  - detail and small components pack in functionality such as search boxes, pagination, sort icons, etc.
  - not appropriate for touch interface



Plugins - tables

- DynaTable
  - More JSON compatibility
  - http://www.dynatable.com/
- Handsontable (non jQuery)
  - minimal Excel inline style editing
  - http://handsontable.com

Plugins – tables

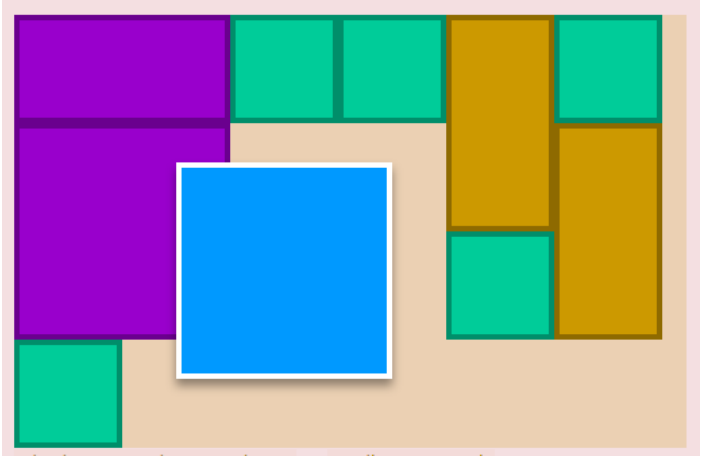
- *DataTables
- http://www.datatables.net/
  - Check cdnjs.com for associated modules

Plugins – pagination with MVC

- PagedList (.NET)
  - https://www.nuget.org/packages/PagedList.Mvc

Plugins – layout

- Pinterest style
- *Packery – no gaps
  - http://packery.metafizzy.co/
- Minigrid – simple
  - http://alves.im/minigrid/
  -



Plugins – layout

- Magnet
  - http://codecanyon.net/item/magnet-jquery-plugin-for-filterable-layouts
- Windows8 look
  - http://sarasoueidan.com/blog/windows8-animations/demo/index.html

Exercises

- DataTables

jQuery UI Interactions

Drag and drop - JQueryUI

- in CSS set **cursor: move** on draggable elements
- workflow:
  - set up html image elements
  - set up jQuery draggable & droppable behaviors on those images
  - set up jQuery special animations - optional
  - set up CSS visual hints for cursor, activeClass, hoverClass

Drag and drop - JQueryUI

- draggable
  - events - start, stop, drag
- droppable
  - activeClass:, hoverClass:
  - accept: - a list of valid draggables
  - events – over, out, drop

Drag and drop - JQueryUI

- CSS
  - #paper { cursor:move; }
- jQuery
  - $('#paper, #paper2').draggable({
    revert: 'invalid', cursor: 'move' , containment: 'parent' });
    $('#trash').droppable({
    drop: function (event, ui) {
    $(ui.draggable).hide('slow');
    console.log($(event));
    console.log($(ui));
    }
    });

Drag and drop - JQueryUI

- Use Google images to find trash and crumpled paper images
- HTML
  -
    <img id='trash' src='?' style='height:200px; float:right' />
    <img id='paper' src='?' style='height:100px;'/>
    <img id='paper2' src='?' style='height:100px;'/>

Drag and drop - JQueryUI

- Other options
  - axis – to drag on X or Y axis only
  - containment – to drag within a restricted area
  - handle – to define an area to drag for a larger element
  - opacity / helper – show a shadowed version when dragging

Drag and drop - plugins

- Draggabilly
  - http://draggabilly.desandro.com/
  - https://github.com/chienhungchen/droppabilly
- Pep
  - http://pep.briangonzalez.org/

Resizing - JQueryUI

- http://jqueryui.com/demos/resizable/
- Resizable <textarea> with options
  - $('textarea').resizable(
    { grid : [20, 20],
    minWidth : 153,
    minHeight : 30,
    maxHeight : 220,
    containment: 'parent'
    });

Sorting - JQueryUI

- A special kind of droppable
  - all children are draggable and will reorder
  - no permanent sorting involved
- HTML
  - <ul id='fruit-list'>
    <li id='appleID'>Apple</li>
    <li id='bananaID'>Banana</li>
    <li id='cherryID'>Cherry</li> </ul>
- CSS
  - li { padding:.5em; margin-bottom: 1em; border: solid; width: 100px; }

Sorting - JQueryUI

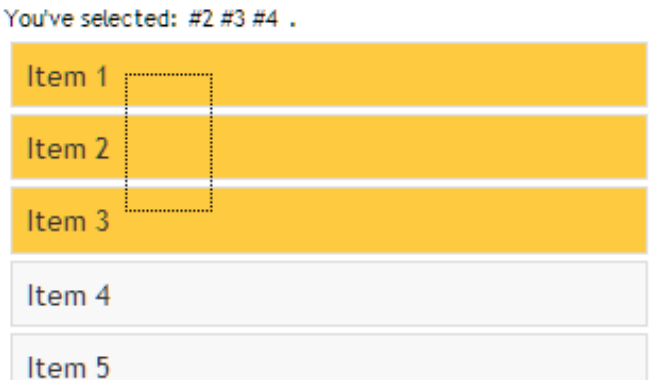
- jQuery
  - $('#fruit-list').sortable({
  - update: function (event, ui) {
  - var fruitOrder = $(this).sortable('toArray').toString();
  - $('#fruit-list').parent().append($('<p>').text(fruitOrder));
  - }
  - });

Sorting - plugins

- jQuery Sortable
  - http://johnny.github.io/jquery-sortable/

Selectable

- Select by dragging a box (lasso) over elements
- selectable( ) function
  - apply to the <ul> container
  - applies classes ui-selecting and ui-selected
  - event sequences
    - start, selecting, … , selected, stop
    - start, unselecting, … , unselected, stop



Libraries/Plugins - Touch

- *jQuery.event.swipe
  - from jQuery Mobile custom download
- TouchPunch
- Touchy.js
  - https://github.com/jairajs89/Touchy.js

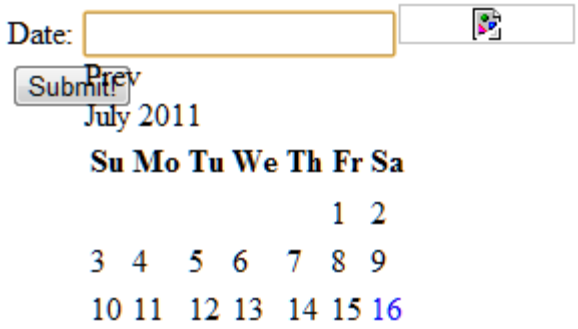
Exercise

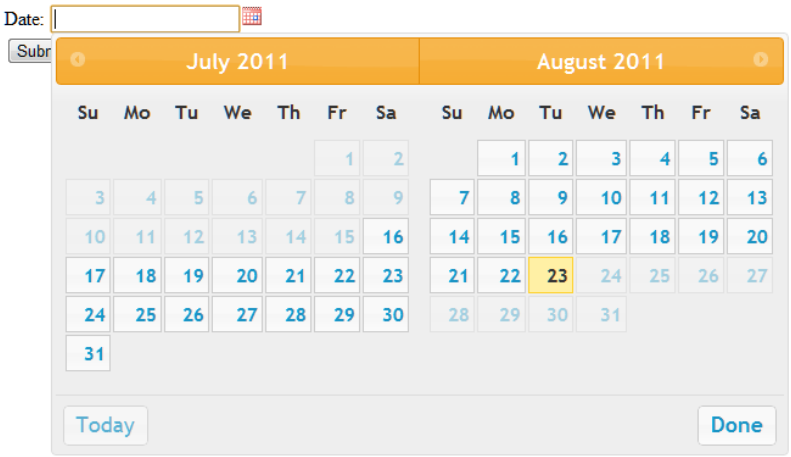
- Follow instructions in Exercises handout for
  - 33. Drag & drop

jQuery UI Controls

Datepicker

- $('#date').datepicker({
  showOn: 'button',
  buttonText: 'Choose a date',
  buttonImage: 'calendar.png',
  buttonImageOnly: true,
  numberOfMonths: 2,
  maxDate: '0d',
  minDate: '-1m -1w',
  showButtonPanel: true
  });
- Needs a theme!
- setDefaults( ), parseDate( ), formatDate( )



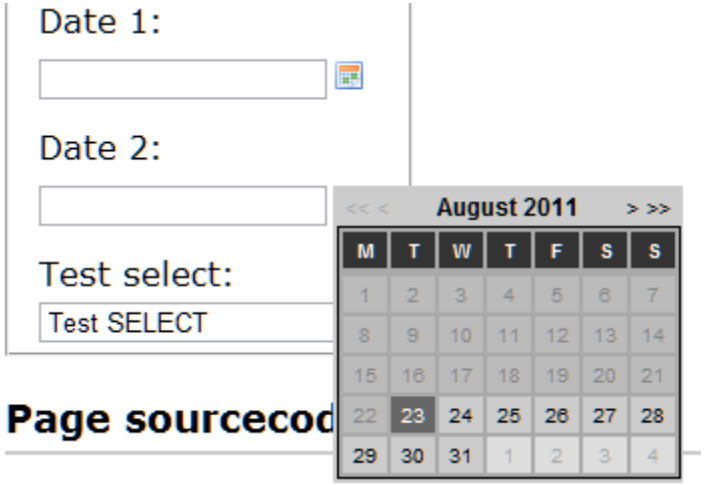


Datepicker

- Calendar button online
  - http://jqueryui.com/demos/datepicker/images/calendar.gif

Plugins - controls

- Datepicker
  - http://www.kelvinluck.com/assets/jquery/datePicker/v2/demo/



Progress bar

- One block element to show
  -
- jQuery
  - $('#bar').progressbar({ value: 10 });
- jQuery updating the bar
  - ```
    var i = 0;
    var intervalID = setInterval(moveBar, 100);
    function moveBar() {
        $('#bar').progressbar('value', i +=5 );
        if (i == 100) { clearInterval(intervalID); }
    }
    ```

    ```

# 1.9 Controls

- 1.9
  - Spinner - http://wiki.jqueryui.com/w/page/12138077/Spinner
  - Tooltip - http://wiki.jqueryui.com/w/page/12138112/Tooltip
  - Menu - http://view.jqueryui.com/master/tests/visual/menu/menu.html

# Exercise

- Follow instructions in Exercises handout for
  - 35. Dialogs and a datepicker

# End matter

# Plugin aggregators

- The jQuery Plugin Registry
  - http://plugins.jquery.com/
- jQuer.in
  - http://jquer.in/

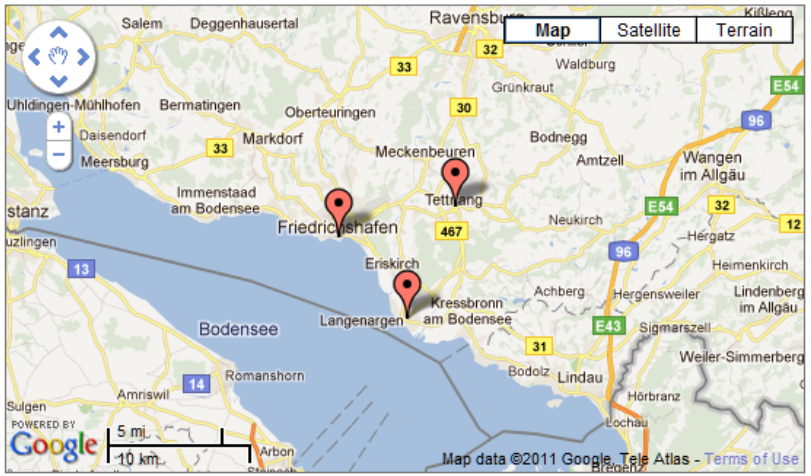
# Plugins – Files

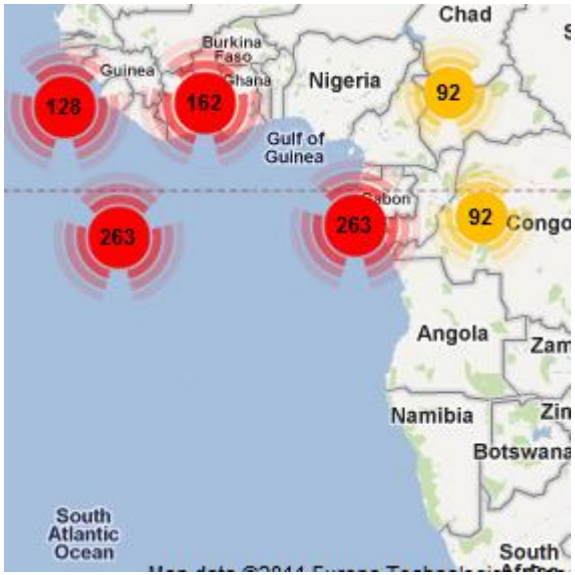
- HTML5 Uploader (file upload)
  - http://www.igloolab.com/jquery-html5-uploader/
- Uploads
  - http://tutorialzine.com/2011/09/html5-file-upload-jquery-php/
- Filesystem API (Webkit and future browsers)
  - filer - https://github.com/ebidel/filer.js

# Plugins - Maps

- http://gmap.nurtext.de/
- http://code.google.com/p/jquery-ui-map/
- http://www.mosne.it/playground/mosne_map/

```
$("#map4").gMap({ markers: [{ latitude: 47.651968,
                              longitude: 9.478485,
                              html: "_latlng" },
                            { address: "Tettnang, Germany",
                              html: "The place I live" },
                            { address: "Langenargen, Germany",
                              html: "_address" }],
                  address: "Braitenrain, Germany",
                  zoom: 10 });
```





Plugins - Maps

- Mapit - http://vdw.github.io/MapIt/

Frameworks

- jQuery UI
  - no touch event support
    - Use simple plugin - http://touchpunch.furf.com/
    - Use better Hammer.js - http://hammerjs.github.io/
- Wijmo – full UI library to extend jQuery
  - http://wijmo.com/
  - no touch events
  - $495/795/895/1195

Sorting - packages

- List.js (3k)
  - http://listjs.com/
  - lists/tables searchable, sortable and filterable

Directories

- Uibox - http://www.uibox.in/
- The Badass List of Essential jQuery plugins - http://hasinhayder.github.io/essential-jquery-plugins/

Libraries - routing & history

- BBQ - Back Button and Query http://benalman.com/projects/jquery-bbq-plugin/
- Crossroads http://millermedeiros.github.com/crossroads.js/ and Hasher (history)

Libraries - dependency script loading

- require.js
  - http://requirejs.org/
- manages sequence of script modules
- combines scripts for deployment
- loads code as needed
- Alternatives:
  - Shepherd.js

Libraries - misc

- PDF generation
  - http://parall.ax/products/jspdf
- Table to JSON
  - http://lightswitch05.github.io/table-to-json
- Text editor
  - http://hallojs.org/ - simple in-place
- jQueryUI replacement libraries
  - http://jquery-jkit.com/

Plugin collections

- http://www.thepetedesign.com/
- http://www.unheap.com/

Learning

- Tutorials
  - http://jqfundamentals.com/
- Conferences
  - http://events.jquery.org/
  - http://lanyrd.com/topics/jquery/

Last tasks

- Certificate
- Evaluations
  - MTM link on desktop
  - http://www.MetricsThatMatter.com/centriqfoss1
- Take your code