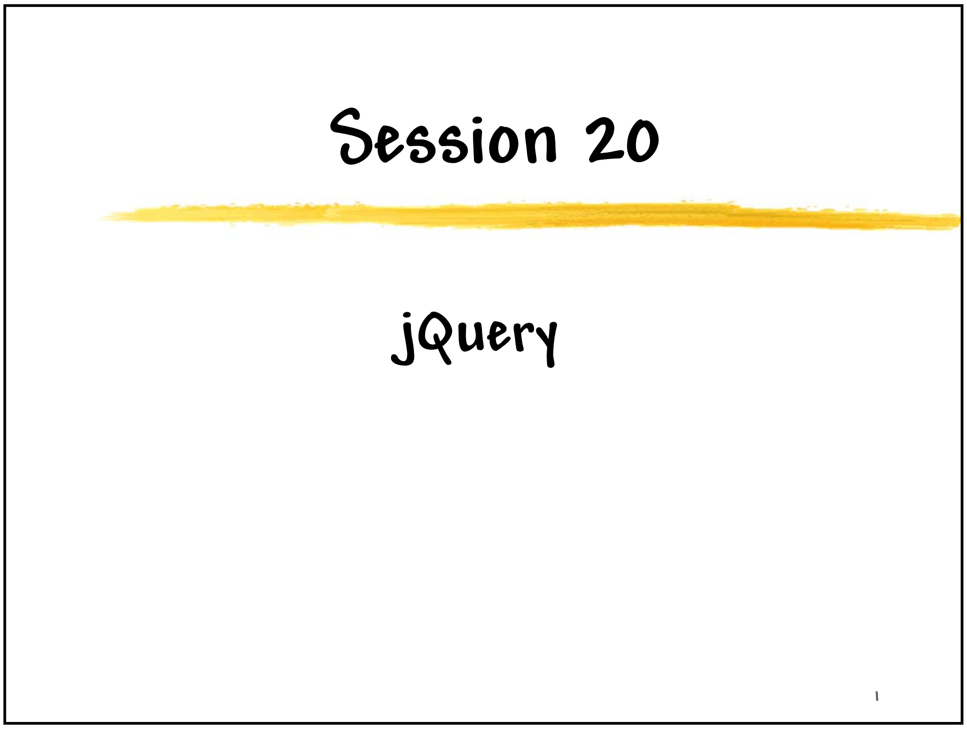
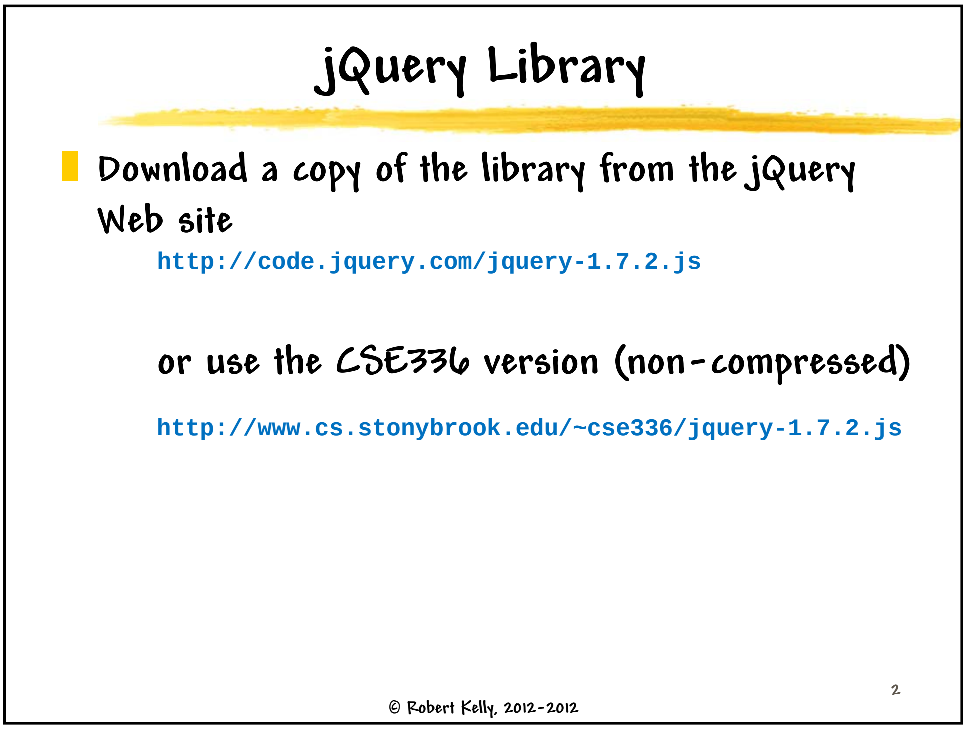


Session 20

jQuery



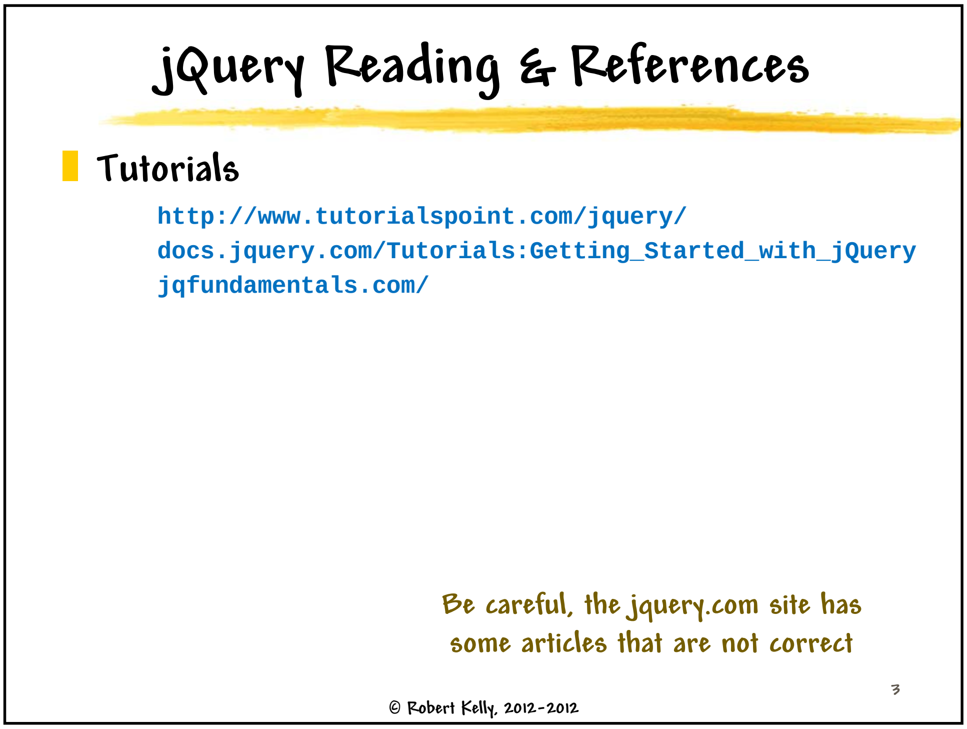
jQuery Library

- Download a copy of the library from the jQuery Web site

  `http://code.jquery.com/jquery-1.7.2.js`

  or use the CSE336 version (non-compressed)

  `http://www.cs.stonybrook.edu/~cse336/jquery-1.7.2.js`



jQuery Reading & References

- Tutorials

  http://www.tutorialspoint.com/jquery/
  docs.jquery.com/Tutorials:Getting_Started_with_jQuery
  jqfundamentals.com/

Be careful, the jquery.com site has some articles that are not correct

3

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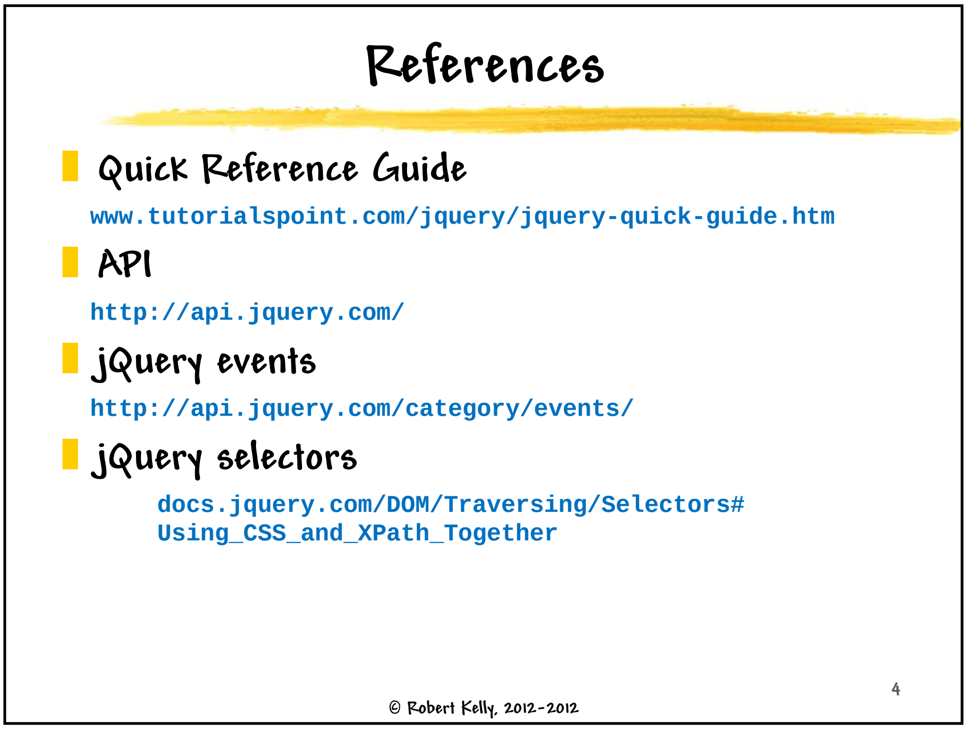

References

- Quick Reference Guide

  www.tutorialspoint.com/jquery/jquery-quick-guide.htm
- API

  http://api.jquery.com/
- jQuery events

  http://api.jquery.com/category/events/
- jQuery selectors

  docs.jquery.com/DOM/Traversing/Selectors#Using_CSS_and_XPath_Together

4

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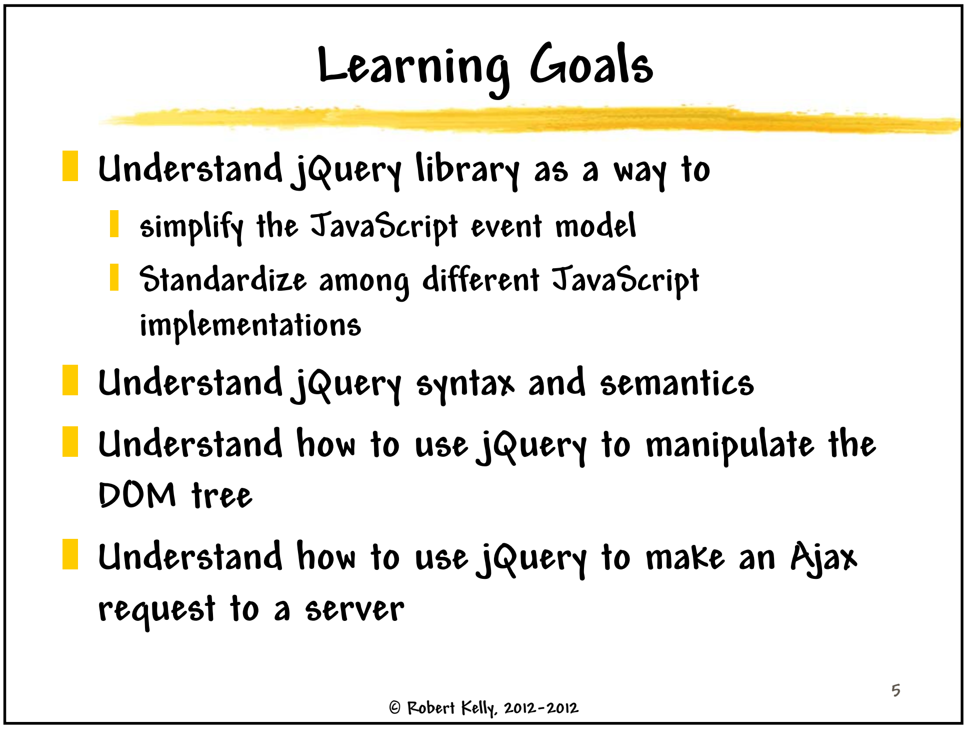
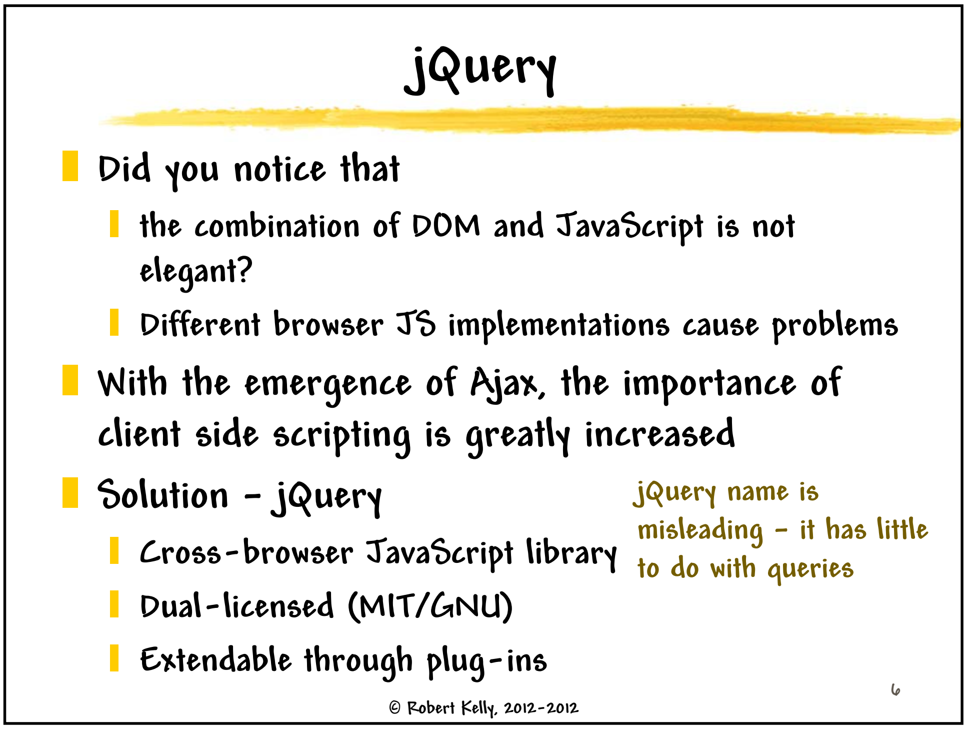


Learning Goals

- Understand jQuery library as a way to
  - simplify the JavaScript event model
  - Standardize among different JavaScript implementations
- Understand jQuery syntax and semantics
- Understand how to use jQuery to manipulate the DOM tree
- Understand how to use jQuery to make an Ajax request to a server

5



jQuery

- Did you notice that
  - the combination of DOM and JavaScript is not elegant?
  - Different browser JS implementations cause problems
- With the emergence of Ajax, the importance of client side scripting is greatly increased
- Solution - jQuery
  - Cross-browser JavaScript library
  - Dual-licensed (MIT/GNU)
  - Extendable through plug-ins

jQuery name is misleading - it has little to do with queries

6

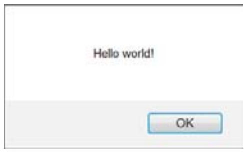
Hello jQuery World

```
<head>
<script type="text/javascript" src="jquery-1.7.2.js"></script>
<script type="text/javascript">
$(document).ready(function() {
  $("a").click(function() {
    alert("Hello world!");
  });
});
</script>
</head>
<body>
<a href="">Link</a>
</body>
</html>
```

The jQuery ready function provides a handler to execute when the page has loaded

Ready function parameter is typically an anonymous function

Link


Hello world!

$ (a valid JavaScript identifier) represents the jQuery function ($() constructs a new jQuery object)

7

A Closer Look

```
<head>
<script type="text/javascript" src="jquery-1.7.2.js"></script>
<script type="text/javascript">
$(document).ready(
  function() {
  $("a").click(function() {
    alert("Hello world!");
  });
});
</script>
</head>
<body>
<a href="">Link</a>
</body>
</html>
```

$("a"), a jQuery selector, constructs a new jQuery object, consisting of all anchor elements in the page

The click() function is a method of the jQuery object. It binds a click event to all selected elements

The click function replaces the use of the JavaScript onclick event handler
(and we do not need onclick for every anchor tag)

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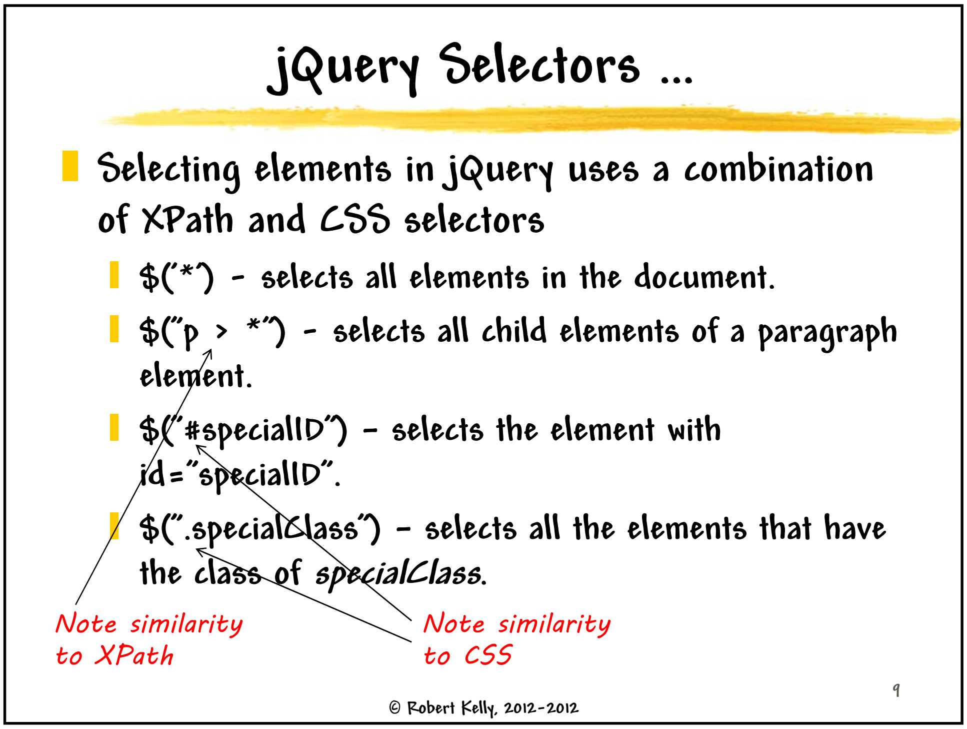

jQuery Selectors …

- Selecting elements in jQuery uses a combination of XPath and CSS selectors
  - $("*") - selects all elements in the document.
  - $("p > *") - selects all child elements of a paragraph element.
  - $("#specialID") – selects the element with id="specialID".
  - $(".specialClass") – selects all the elements that have the class of *specialClass*.

Note similarity to XPath

Note similarity to CSS

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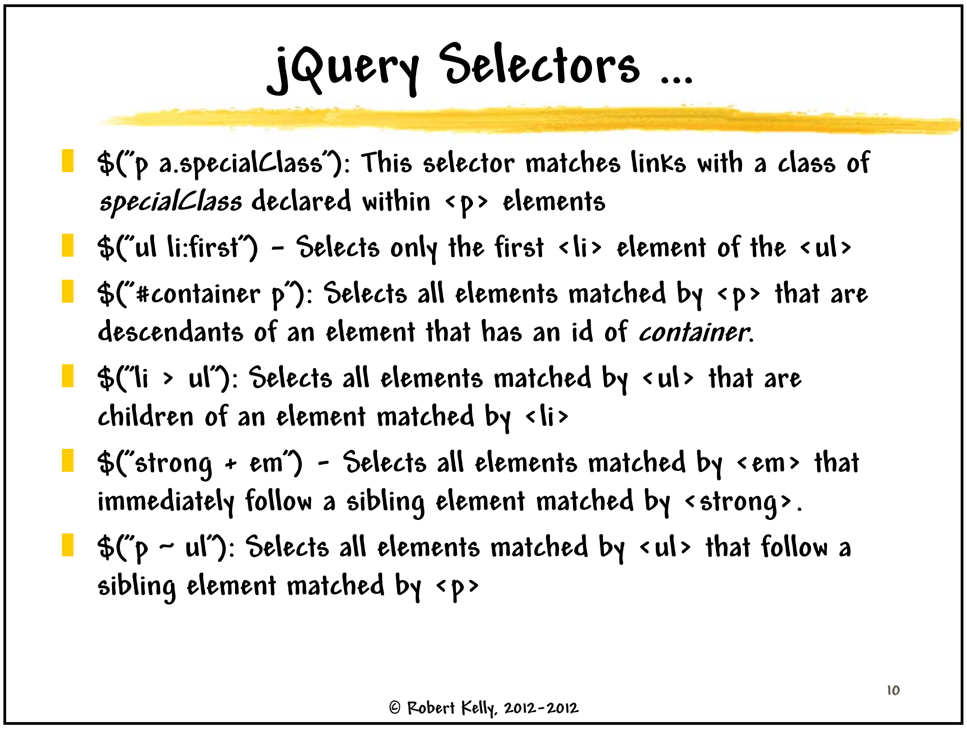

jQuery Selectors …

- $("p a.specialClass"): This selector matches links with a class of *specialClass* declared within <p> elements
- $("ul li:first") – Selects only the first <li> element of the <ul>
- $("#container p"): Selects all elements matched by <p> that are descendants of an element that has an id of *container*.
- $("li > ul"): Selects all elements matched by <ul> that are children of an element matched by <li>
- $("strong + em") - Selects all elements matched by <em> that immediately follow a sibling element matched by <strong>.
- $("p ~ ul"): Selects all elements matched by <ul> that follow a sibling element matched by <p>

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jQuery Selectors

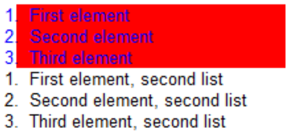
- $("code, em, strong") - Selects all elements matched by <code> or <em> or <strong>.
- $("p strong, .myclass") - Selects all elements matched by <strong> that are descendants of an element matched by <p> as well as all elements that have a class of *myclass*.
- $(":empty") - Selects all elements that have no children.
- $("p:empty") - Selects all elements matched by <p> that have no children.

Many more selectors in the jQuery Quick Guide

jQuery Selector Example

- Example:

```
$(document).ready(function() {
  $("#orderedlist").addClass("red");
  $("#orderedlist > li").addClass("blue");
});
…
<ol id="orderedlist">
    <li>First element</li>
    <li>Second element</li>
    <li>Third element</li>
  </ol>
  <ol id="orderedlist2">
    <li>First element, second list</li>
    <li>Second element, second list</li>
    <li>Third element, second list</li>
    <li>Li with child ul
      <ul>
        <li>Child One</li>
        <li>child two</li>
      </ul>    </li>  </ol>
```

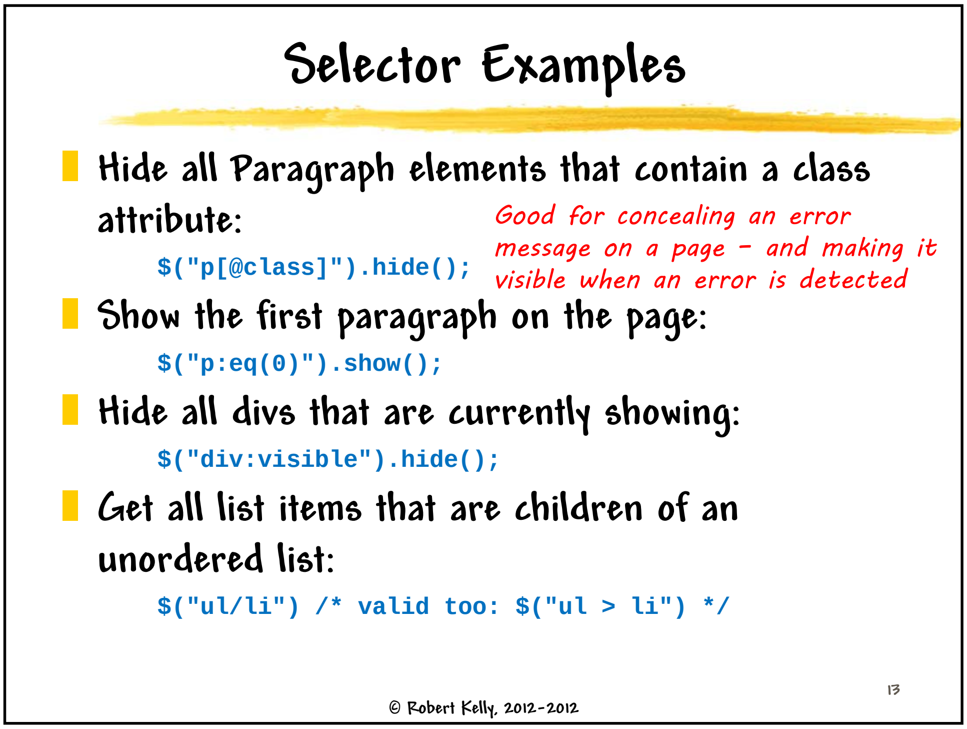


```
1. First element
2. Second element
3. Third element
1. First element, second list
2. Second element, second list
3. Third element, second list
```

Above JS adds class="red" to the ol element and adds class="blue" to each of the li elements

Screen.css

```
.red { background-color: red;}
.blue { color: blue; }
.green { color: green; }
```



Selector Examples

- Hide all Paragraph elements that contain a class attribute:

  `$("p[@class]").hide();`

  Good for concealing an error message on a page – and making it visible when an error is detected

- Show the first paragraph on the page:

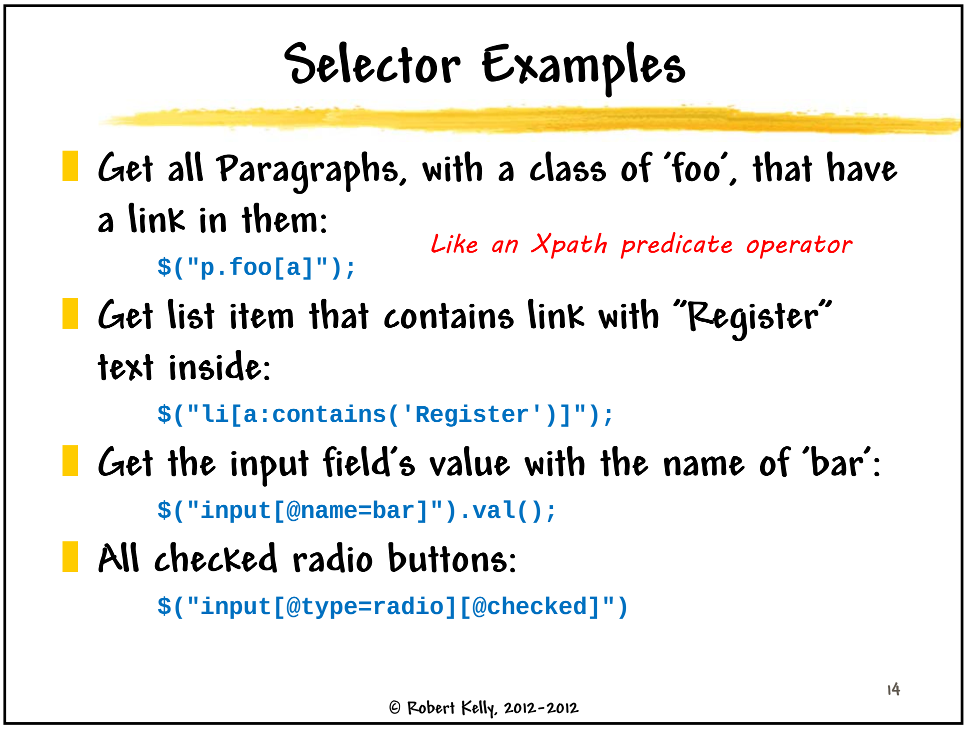
  `$("p:eq(0)").show();`

- Hide all divs that are currently showing:

  `$("div:visible").hide();`

- Get all list items that are children of an unordered list:

  `$("ul/li") /* valid too: $("ul > li") */`



Selector Examples

- Get all Paragraphs, with a class of 'foo', that have a link in them:

  `$("p.foo[a]");`

  Like an Xpath predicate operator

- Get list item that contains link with "Register" text inside:

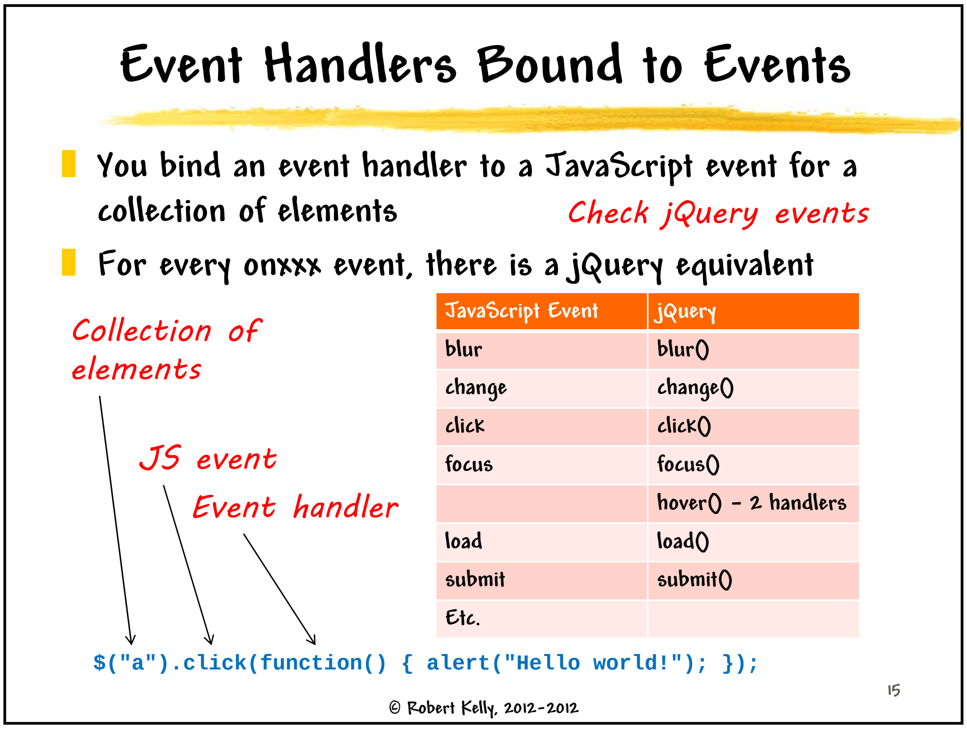
  `$("li[a:contains('Register')]");`

- Get the input field's value with the name of 'bar':

  `$("input[@name=bar]").val();`

- All checked radio buttons:

  `$("input[@type=radio][@checked]")`



Event Handlers Bound to Events

- You bind an event handler to a JavaScript event for a collection of elements

Check jQuery events

- For every onxxx event, there is a jQuery equivalent

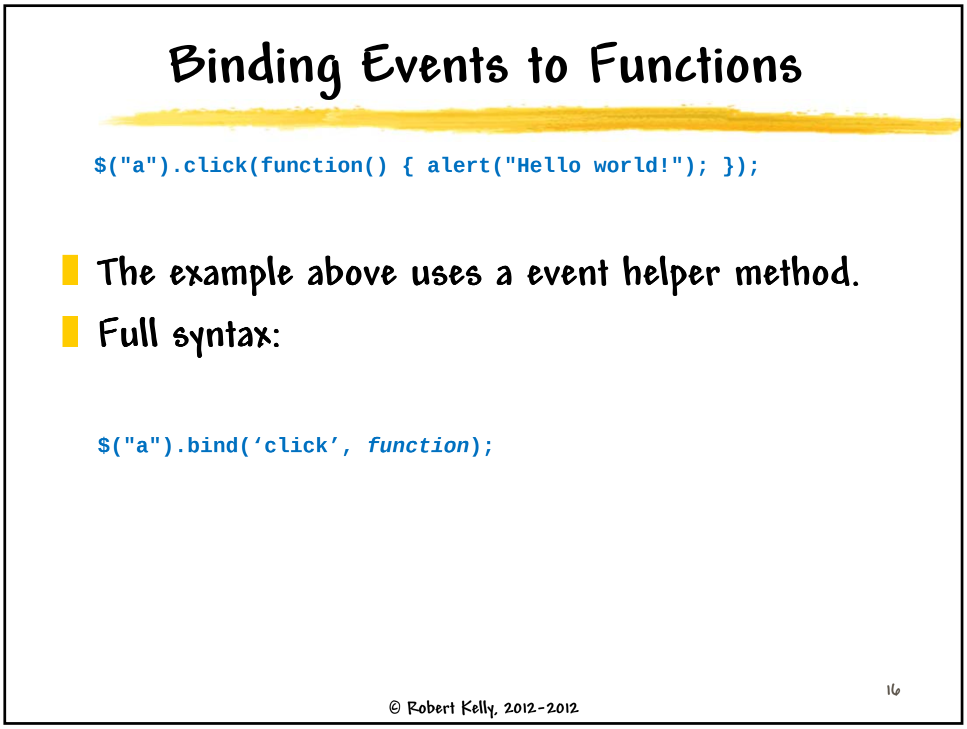
JavaScript Event	jQuery
blur	blur()
change	change()
click	click()
focus	focus()
	hover() - 2 handlers
load	load()
submit	submit()
Etc.	

Collection of elements

JS event

Event handler

```
$("a").click(function() { alert("Hello world!"); });
```

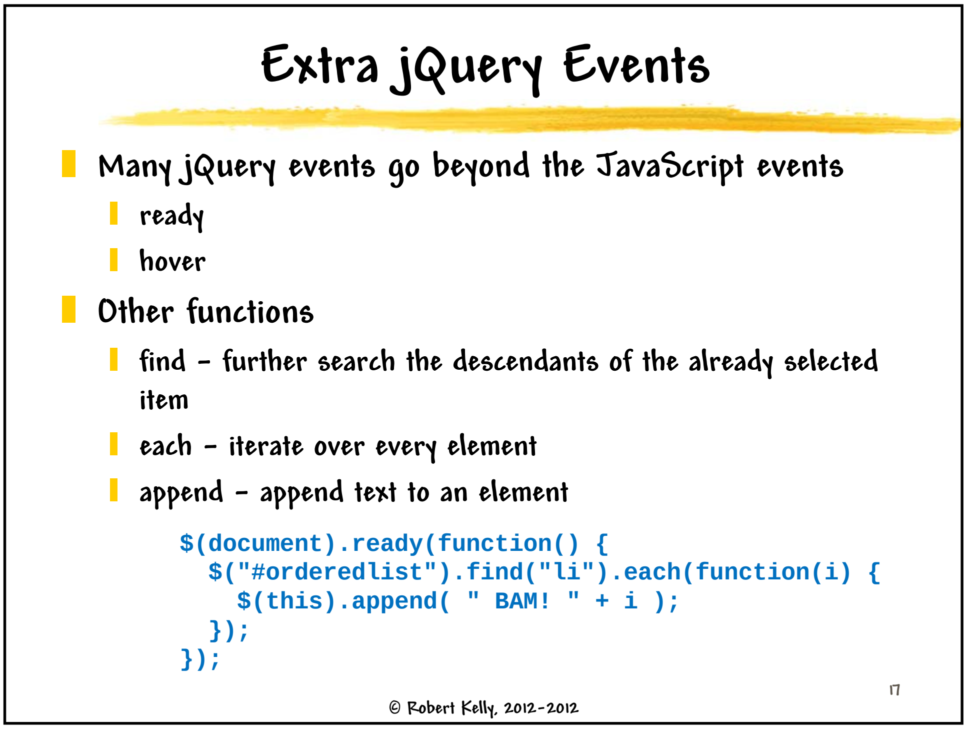


Binding Events to Functions

```
$("a").click(function() { alert("Hello world!"); });
```

- The example above uses a event helper method.
- Full syntax:

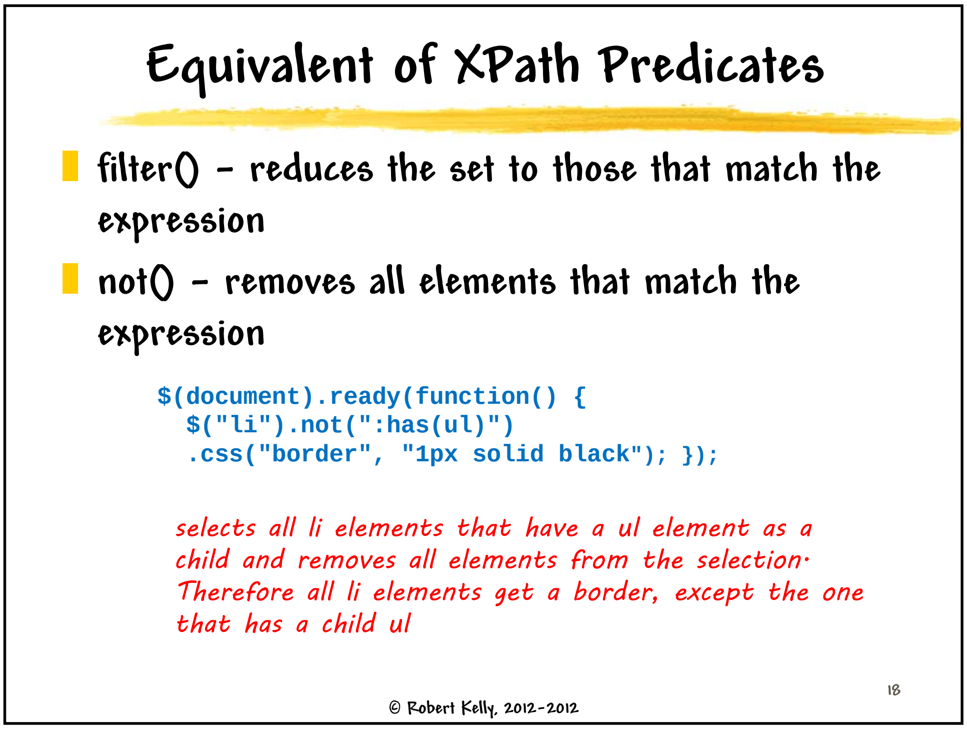
```
$("a").bind('click', function);
```



Extra jQuery Events

- Many jQuery events go beyond the JavaScript events
  - ready
  - hover
- Other functions
  - find – further search the descendants of the already selected item
  - each – iterate over every element
  - append – append text to an element

```
$(document).ready(function() {
  $("#orderedlist").find("li").each(function(i) {
    $(this).append( " BAM! " + i );
  });
});
```



Equivalent of XPath Predicates

- filter() – reduces the set to those that match the expression
- not() – removes all elements that match the expression

```
$(document).ready(function() {
  $("li").not(":has(ul)")
  .css("border", "1px solid black"); });
```

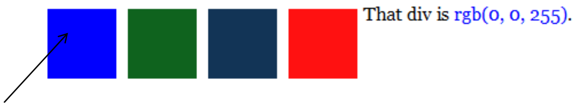
selects all li elements that have a ul element as a child and removes all elements from the selection. Therefore all li elements get a border, except the one that has a child ul

CSS Getter and Setter Methods

- Supports nearly all of CSS selectors
- css()
  - Getter - css(propertyName)
  - Setter - css(propertyName, propertyValue)
- Gets or sets a css property value from the first matched element
- Accounts for JavaScript function name differences among browsers

css() Example

www.cs.stonybrook.edu/~cse336/CSS-Example.html



That div is rgb(0, 0, 255).

click

Notice the color of the text

… css() Example

```
<style>
div { width:60px; height:60px; margin:5px; float:left; }
</style>
  <script src="http://www.cs.stonybrook.edu/~cse336/jquery-
1.7.2.js"></script>
</head>
<body>
<span id="result">&nbsp;</span>
<div style="background-color:blue;"></div>
<div style="background-color:rgb(15,99,30);"></div>
<div style="background-color:#123456;"></div>
<div style="background-color:#f11;"></div>
<script>
$("div").click(function () {
  var color = $(this).css("background-color");
  $("#result").html("That div is <span style='color:" +
                   color + ";'>" + color + "</span>.");
});

</script>
```

div element that was clicked

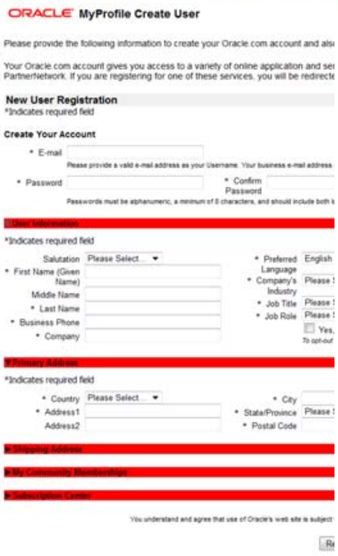
Element with an id of "result"

Acts like innerhtml

Are We on Track?

- For your Oracle project, select all h3 tags that have a class attribute.
- Set the background color of the h3 to red
- Hints:
  - Be sure to reference the jQuery library (you can access jquery-1.7.2.js from the class Web site)

OracleForm-Strict.htm is available on CSE336 site



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New User Registration
*Indicates required field

Create Your Account

* E-mail

Please provide a valid e-mail address as your Username. Your business e-mail address

* Password

* Confirm Password

Passwords must be alphanumeric, a minimum of 8 characters, and should include both l

User Information

*Indicates required field

Salutation: Please Select...

* First Name (Given Name)

Middle Name

* Last Name

* Business Phone

* Company

* Preferred Language: English

* Company's Industry: Please S

* Job Title: Please S

* Job Role: Please S

☐ Yes,

To opt-out

▼Primary Address

*Indicates required field

* Country: Please Select...

* Address1

Address2

* City

* State/Province: Please S

* Postal Code

▶Shipping Address

▶My Community Memberships

▶Subscription Center

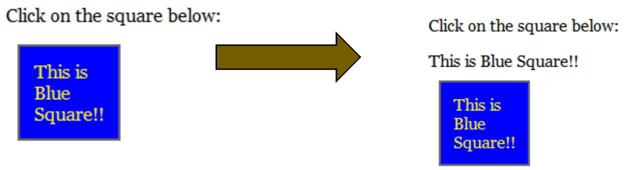
You understand and agree that use of Oracle's web site is subject

Were We on Track?

```
<script type="text/javascript"
src="http://www.cs.stonybrook.edu/~cse336/jquery-1.7.2.js">
</script>
<script type="text/javascript">
 $(document).ready(function() {
   $("h3[class]").css("background", "#ff0000" );
 });
</script>
```

html()

- The html( ) method gets the html contents (innerHTML) of the first matched element
- Example



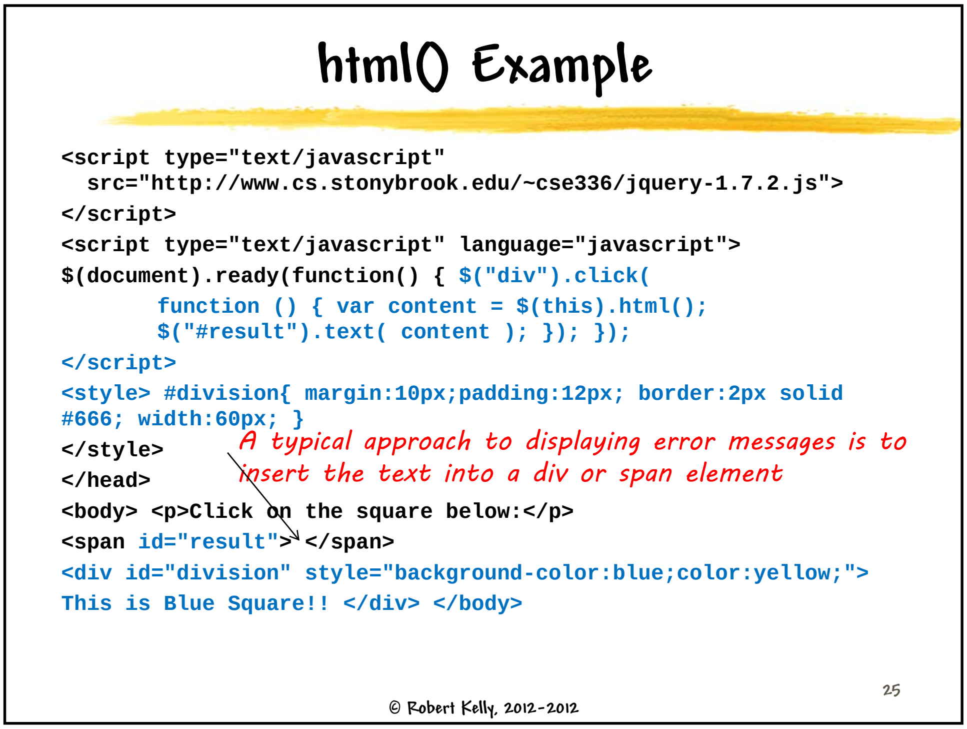
Click on the square below:

This is Blue Square!!

Click on the square below:

This is Blue Square!!

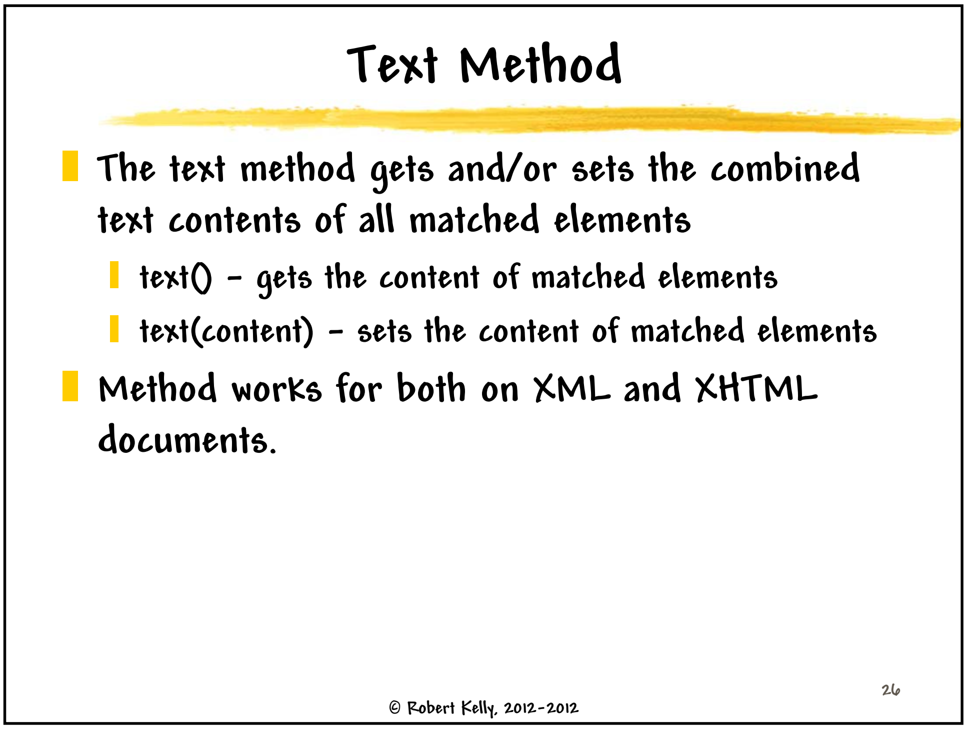
This is Blue Square!!



html() Example

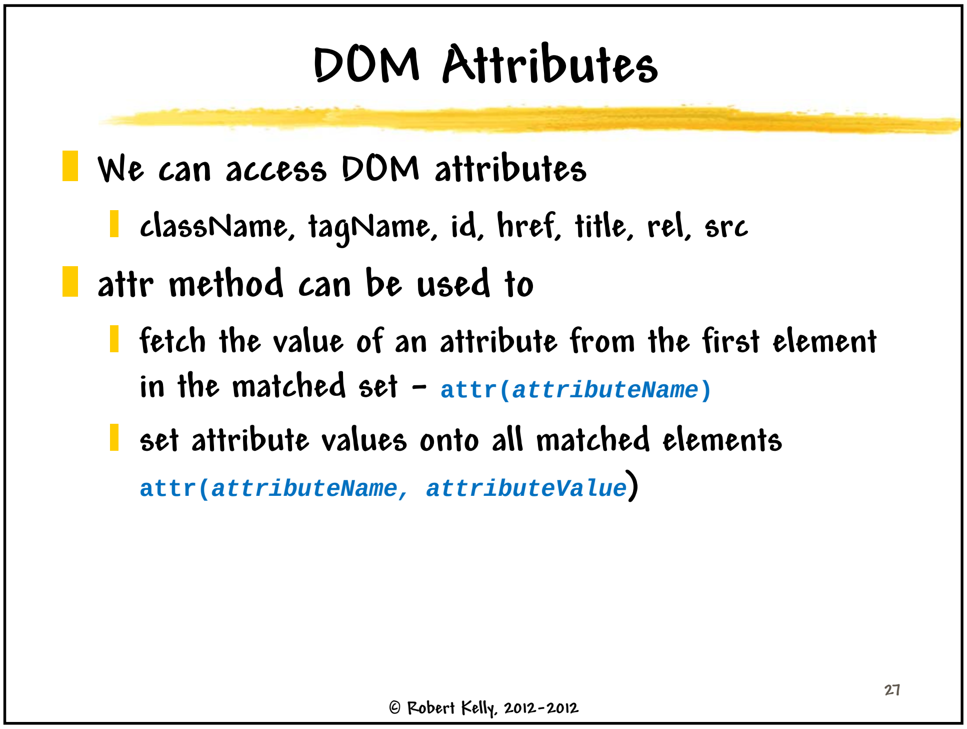
```
<script type="text/javascript"
  src="http://www.cs.stonybrook.edu/~cse336/jquery-1.7.2.js">
</script>
<script type="text/javascript" language="javascript">
$(document).ready(function() { $("div").click(
       function () { var content = $(this).html();
       $("#result").text( content ); }); });
</script>
<style> #division{ margin:10px;padding:12px; border:2px solid
#666; width:60px; }
</style>
</head>
<body> <p>Click on the square below:</p>
<span id="result"> </span>
<div id="division" style="background-color:blue;color:yellow;">
This is Blue Square!! </div> </body>
```

A typical approach to displaying error messages is to insert the text into a div or span element



Text Method

- The text method gets and/or sets the combined text contents of all matched elements
  - text() - gets the content of matched elements
  - text(content) - sets the content of matched elements
- Method works for both on XML and XHTML documents.



DOM Attributes

- We can access DOM attributes
  - className, tagName, id, href, title, rel, src
- attr method can be used to
  - fetch the value of an attribute from the first element in the matched set - `attr(attributeName)`
  - set attribute values onto all matched elements `attr(attributeName, attributeValue)`

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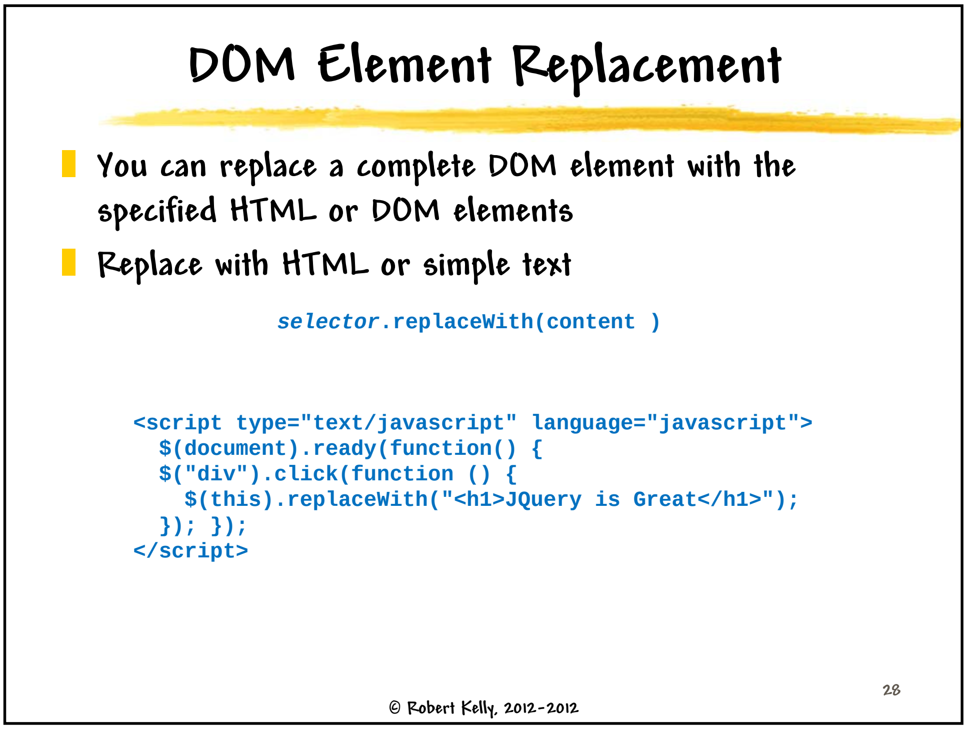

DOM Element Replacement

- You can replace a complete DOM element with the specified HTML or DOM elements
- Replace with HTML or simple text

```
selector.replaceWith(content )
```

```
<script type="text/javascript" language="javascript">
  $(document).ready(function() {
  $("div").click(function () {
    $(this).replaceWith("<h1>JQuery is Great</h1>");
  }); });
</script>
```

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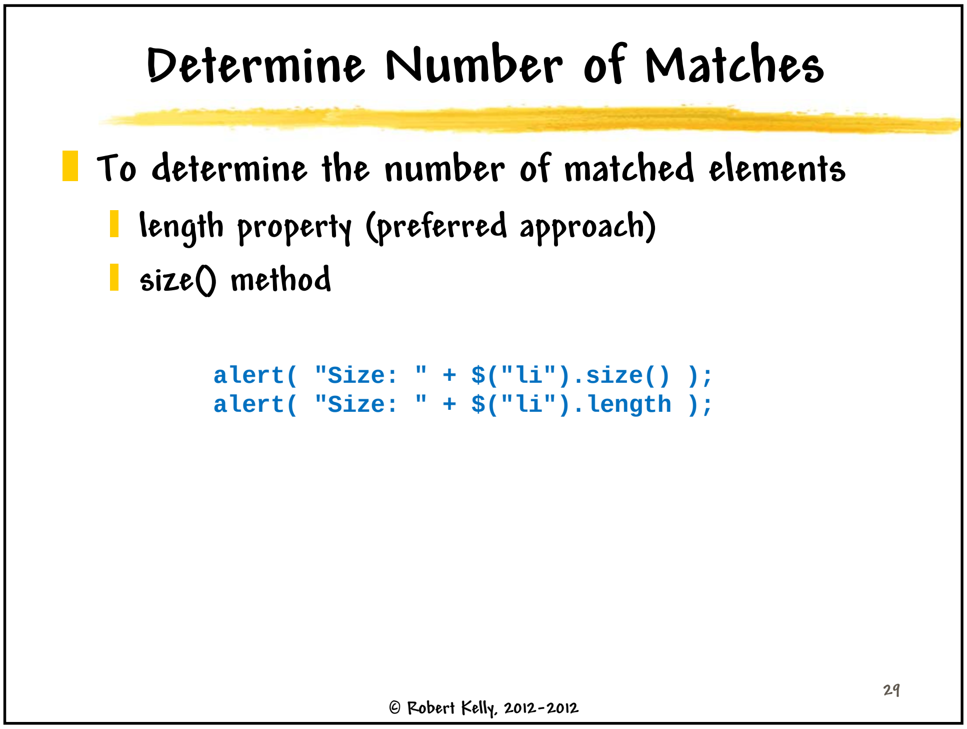

Determine Number of Matches

- To determine the number of matched elements
  - length property (preferred approach)
  - size() method

```
alert( "Size: " + $("li").size() );
alert( "Size: " + $("li").length );
```

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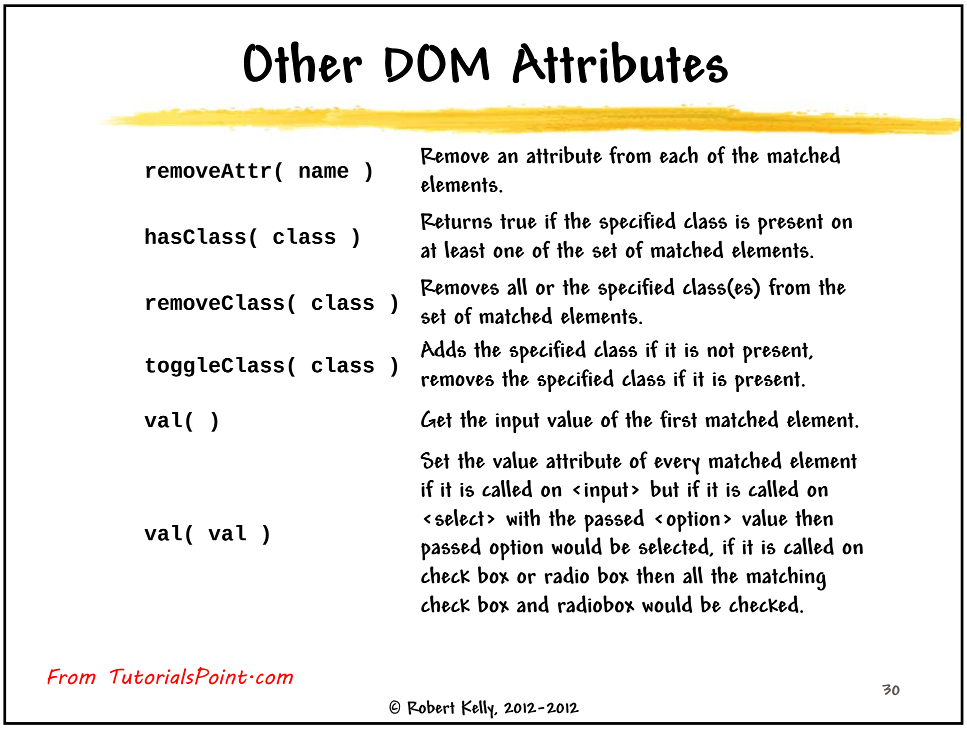

Other DOM Attributes

`removeAttr( name )`	Remove an attribute from each of the matched elements.
`hasClass( class )`	Returns true if the specified class is present on at least one of the set of matched elements.
`removeClass( class )`	Removes all or the specified class(es) from the set of matched elements.
`toggleClass( class )`	Adds the specified class if it is not present, removes the specified class if it is present.
`val( )`	Get the input value of the first matched element.
`val( val )`	Set the value attribute of every matched element if it is called on <input> but if it is called on <select> with the passed <option> value then passed option would be selected, if it is called on check box or radio box then all the matching check box and radiobox would be checked.

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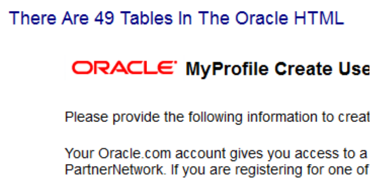
Are We on Track?

- Using a h3 element in you project html, count the number of table elements.



There Are 49 Tables In The Oracle HTML

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Were We on Track?

```
…
 $(document).ready(function() {
   var tc = $("table").length;
   $("#tableCount").html(tc);
 });
</script>
</head>
<body id="d1“>
<h3>There are <span id="tableCount"> </span> tables in the Oracle
HTML</h3>
```

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jQuery - AJAX

- jQuery allows easy, browser-consistent use of Ajax
- jQuery load method

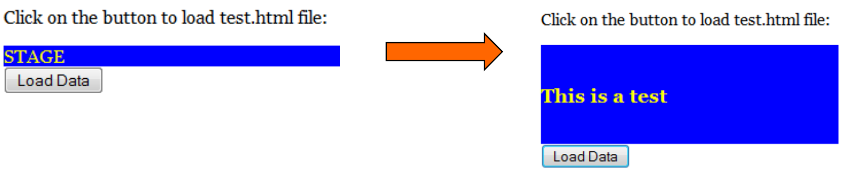
```
$('#result').load('ajax/test.html');
```

  - Fetches data from a server
  - Sets the html contents of the matched element to the return data

Example

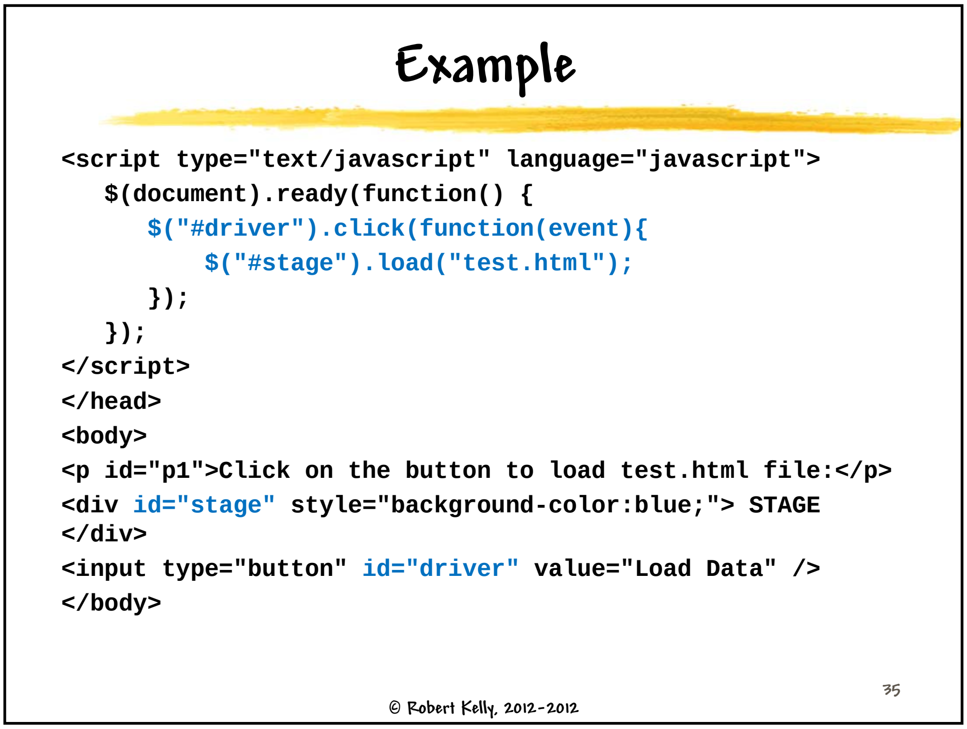
- Insert test.html into page

```
<br /><h3>This is a test</h3><br />
```



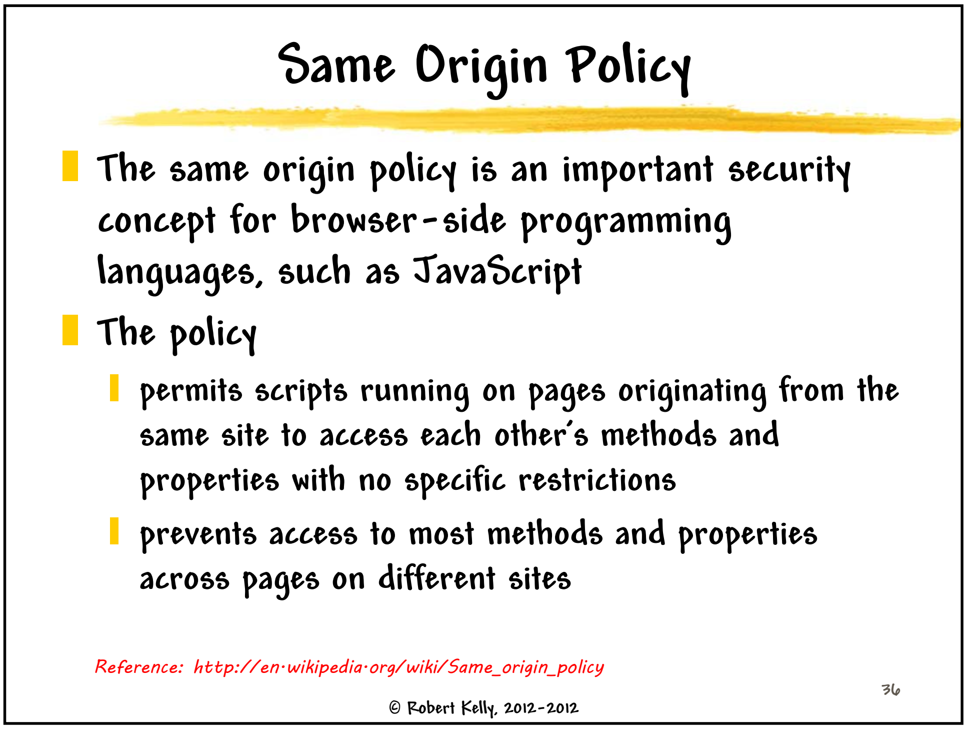
Click on the button to load test.html file:

Click on the button to load test.html file:



Example

```
<script type="text/javascript" language="javascript">
   $(document).ready(function() {
      $("#driver").click(function(event){
          $("#stage").load("test.html");
      });
   });
</script>
</head>
<body>
<p id="p1">Click on the button to load test.html file:</p>
<div id="stage" style="background-color:blue;"> STAGE
</div>
<input type="button" id="driver" value="Load Data" />
</body>
```



Same Origin Policy

- The same origin policy is an important security concept for browser-side programming languages, such as JavaScript
- The policy
  - permits scripts running on pages originating from the same site to access each other's methods and properties with no specific restrictions
  - prevents access to most methods and properties across pages on different sites

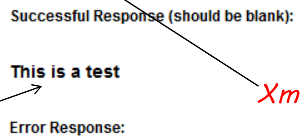
Reference: http://en.wikipedia.org/wiki/Same_origin_policy

Same Origin Example

URL to load is in the same directory as this html

```
<body>
<b>Successful Response (should be blank):</b>
<div id="success"></div>
<b>Error Response:</b>
<div id="error"></div>
<script>
$("#success").load("test.html", function(response,
  status, xhr) {
    if (status == "error") {
      var msg = "Sorry but there was an error: ";
      $("#error").html(msg + "Status:" + xhr.status +
      " " + "StatusText:"+ xhr.statusText);
  }
});
</script>
</body>
```

Callback function invoked after response is inserted



Successful Response (should be blank):

This is a test

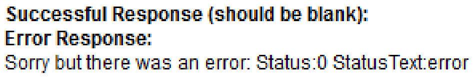
Error Response:

XmlHttpRequest object

Inserted html

Same Origin Example

```
<body>
<b>Successful Response (should be blank):</b>
<div id="success"></div>
<b>Error Response:</b>
<div id="error"></div>
<script>
$("#success").load(
  "http://www.cs.stonybrook.edu/~cse336/test.html",
  function(response, status, xhr) {
    if (status == "error") {
      var msg = "Sorry but there was an error: ";
      $("#error").html(msg + "Status:" + xhr.status +
      " " + "StatusText:"+ xhr.statusText);
  }
});
</script>
</body>
```



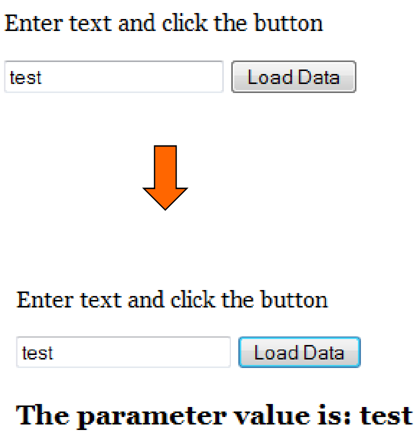
Successful Response (should be blank):
Error Response:
Sorry but there was an error: Status:0 StatusText:error

Insert not allowed because inserted html on different site

Sending an Ajax Request

- To request data from the server
  - Compose a query string
  - Append the query string to the URL
  - Send the Ajax request

Example



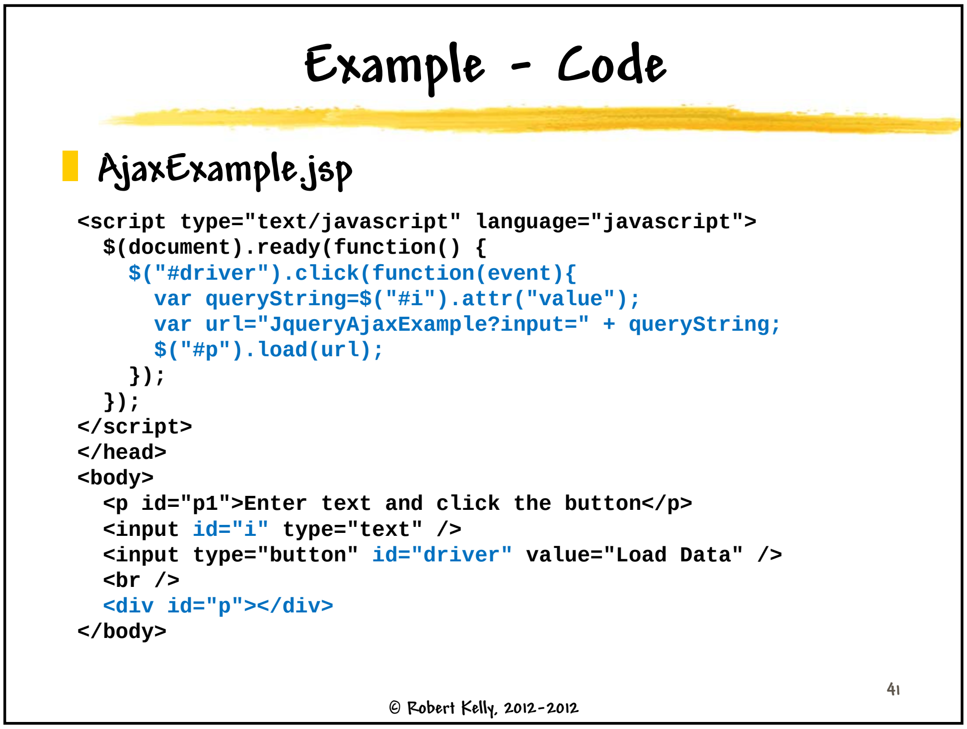
Enter text and click the button

test

Enter text and click the button

test

The parameter value is: test



Example - Code

- AjaxExample.jsp

```
<script type="text/javascript" language="javascript">
  $(document).ready(function() {
    $("#driver").click(function(event){
      var queryString=$("#i").attr("value");
      var url="JqueryAjaxExample?input=" + queryString;
      $("#p").load(url);
    });
  });
</script>
</head>
<body>
  <p id="p1">Enter text and click the button</p>
  <input id="i" type="text" />
  <input type="button" id="driver" value="Load Data" />
  <br />
  <div id="p"></div>
</body>
```

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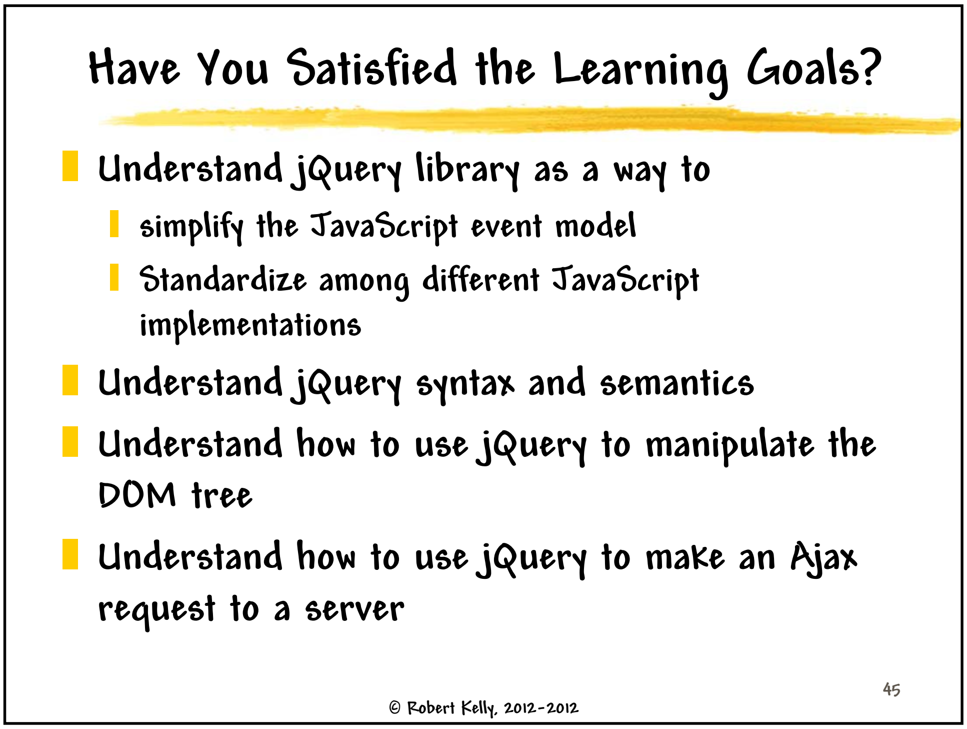

Have You Satisfied the Learning Goals?

- Understand jQuery library as a way to
  - simplify the JavaScript event model
  - Standardize among different JavaScript implementations
- Understand jQuery syntax and semantics
- Understand how to use jQuery to manipulate the DOM tree
- Understand how to use jQuery to make an Ajax request to a server

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