jQuery: Installation, Overview, and Getting Started

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For additional materials, please see http://www.coreservlets.com/. The JavaScript tutorial section contains
complete source code for all examples in the entire tutorial series, plus exercises and exercise solutions for each topic.

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Marty is also available for consulting and development support

Taught by lead author of *Core Servlets & JSP*,
co-author of *Core JSF* (4th Ed), and this tutorial.

Available at public venues, or
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- **Overview**
- **Downloading and using jQuery**
- **Interactive practice**
  - With Firebug or Chrome Developer Tools
- **Manipulating the DOM with jQuery: basics**
  - Lots more detail in later section
- **One small example**
- **Using "jQuery" instead of "$"**

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Overview of jQuery

- **Ajax utilities**
  - General: $.ajax(…), $(…).load(…)
  - Shortcuts: $.get, $.post, $.getJSON
- **DOM search and manipulation utilities**
  - $("p.myStyle").addClass("extraStyle").show();
- **Simple animation**
  - Not as extensive as Scriptaculous, but easy to use
- **Cross-browser event model**
  - Assigns handlers programmatically, hides browser differences
- **General JavaScript utilities**
  - Functions operating on strings and arrays
- **Rich GUIs**
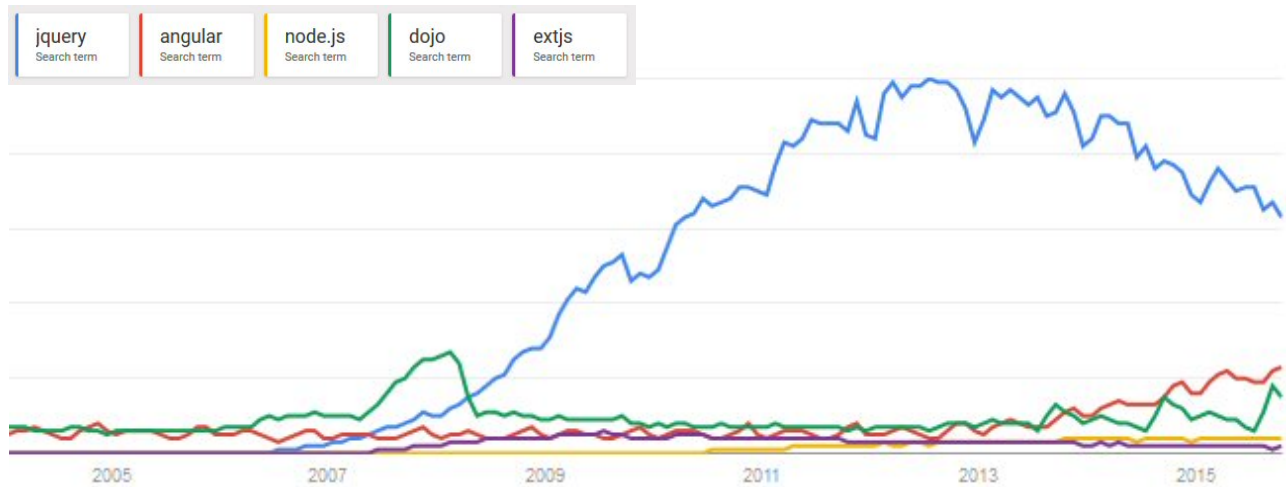 - jQuery UI provides widgets, fancier effects, drag/drop

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Industry Usage (Job Postings)

Job Trends from Indeed.com

— jquery — angular — node.js — dojo — extjs
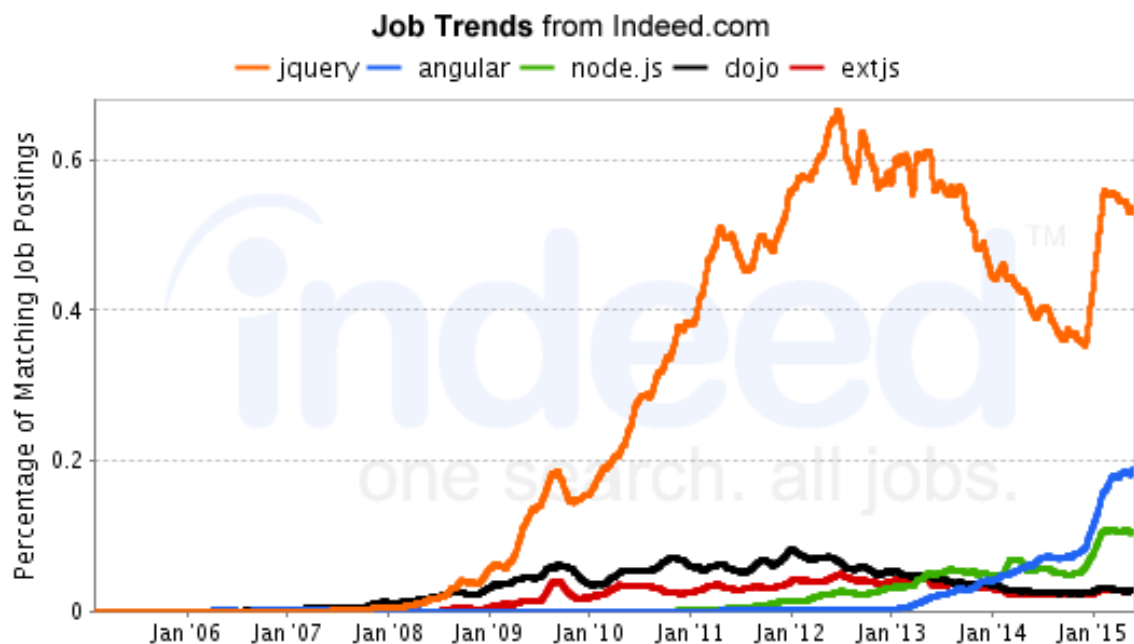
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Industry Usage (Google Searches)

Browser Compatibility

- **Chrome, Firefox, Opera**
  - Current and previous major version
    - Older versions tend to work, but are not tested on new jQuery code
    - Same strategy as Google Docs
- **Internet Explorer**
  - jQuery 1.9: IE 6 and later
  - jQuery 2.*x*: IE 9 and later (same API as jQuery 1.9)
    - As of 10/2015, no mention of Microsoft Edge on official support page, but work is in progress
- **Safari**
  - 5.1 and later
- **Android browser**
  - 4.0 and later
- **iOS browser**
  - 6.1 and later

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JavaScript Testing

- **Problem (from first section on general JavaScript)**
  - Java: very strict compliance tests to be called "Java"
    - You can have very high confidence that code written in Java 8 on Windows version will run identically (except for some differences in how GUIs look) on Java 8 on MacOS, Linux, Solaris, and other Windows versions. True for Java from Oracle, Apple, IBM, or open source version from Brazil.
  - JavaScript: every browser vendor does it themselves, with no outside checks
    - Behavior of same JavaScript program can vary substantially from browser to browser, and even from one release of the same browser to another
- **Consequence**
  - Before final deployment, you must test on all browsers you expect to support
  - One of main benefits of jQuery is that it tries to hides browser differences, and it mostly succeeds
    - But even so, you must test on full range of browsers before final deployment

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Downloading and Using jQuery

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Downloading

- **Main download site**
  - http://jquery.com/download/
- **Development vs. deployment versions**
  - For development, use uncompressed file
    - E.g., jquery-2.1.4.js
  - For deployment, use compressed file
    - E.g., jquery-2.1.4.min.js
- **Rename file to generic name**
  - Rename file to jquery.js (or possibly jquery-2.js)
    - Lets you switch from jquery-2.1.4.js to jquery-2.1.4.min.js without editing many HTML files
    - Similarly, lets you later upgrade to 2.1.5 without editing many HTML files

Typical Approach for Loading jQuery

```
...
<head>
<title>Your Title</title>
<link rel="stylesheet"
      href="css/your-styles.css"/>
<script src="scripts/jquery.js"></script>
<script src="scripts/your-script.js"></script>
</head>
...
```

- You should load jQuery before loading your own scripts that make use of jQuery.
- You should rename jquery-x.y.z.js to jquery.js.

Interactive Testing and Practice

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Practice with Firebug or Chrome

- **Firefox with Firebug**
  - Load HTML page in Firefox
    - HTML page should contain a few random HTML elements and load the core jQuery library. It can optionally have a CSS file.
  - Bring up Firebug
    - Open Firefox, then click on Firebug logo or hit F12
    - In this case, usually better to have Firebug attached to main window instead of as a separate window
  - Click on Console tab
    - Enter commands at bottom and see results at top
- **Chrome alternative is similar**
  - Bring up Chrome via Chrome menu, then Tools → Developer Tools, or Control-Shift-J

```
<!DOCTYPE html>
<html>
<head>
<title>jQuery Test</title>
<link rel="stylesheet" href="css/styles.css"/>
<script src="scripts/jquery.js"></script>
</head>
```

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```
<body>
<h1 class="title">jQuery Test</h1>
<div id="main-div">
<br/>
<h1 class="yellow">This is an h1 (class="yellow")</h1>
<h1>This is another h1</h1>
<h2 class="red">This is an h2 (class="red")</h2>
<h2>This is another h2</h2>
<h3 class="green">This is an h3 (class="green")</h3>
<h3>This is another h3</h3>
...
</div>
</body>
</html>
```

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Things to Try First

- ## $
  - Enter "blah" and it says it is undefined. Enter "$" and it should have a real value.
    - "$" is the name of the main jQuery function (with alias "jQuery")
- ## $("h1")
  - If you have at least 1 h1 in the page, this should return an array of the matches. If you have no h1's, this should return an empty array. In general, you can supply a CSS selector pattern as the argument to $.
- ## $("some-css-pattern").hide("slow")
  - First, try
    ```
    $("some-css-pattern");
    ```
    If it returns a non-empty array, try
    ```
    $("some-css-pattern").hide("slow");
    ```
    and watch the matching elements disappear. Use
    ```
    $("some-css-pattern").show("slow");
    ```
    to make them come back.

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Experimenting with Firebug

Manipulating the DOM with jQuery: Basics

Note: brief intro only. More details in later tutorial section.

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Idea

- **Manipulating the DOM**
  - One of the main uses of jQuery is to find elements in the DOM (Document Object Model – the tree structure that represents the HTML page) and modify them in various ways
- **Quick intro now**
  - You can't do much with jQuery without simple DOM manipulation, so very simple intro now
  - This will be enough to do Ajax – make network requests to the server and get data back
- **Lots more detail later**
  - In section entirely devoted to DOM manipulation

Manipulating DOM: Overview

- **Find HTML elements that match a pattern**
  - $("css selector pattern")
    - Returns array of HTML elements that match
- **Perform operations on the elements**
  - $("css selector pattern").op1(…);
    - Single operation
  - $("css selector pattern").op1(…).op2(…).op3(…);
    - Consecutive operations via "chaining"
- **Example**
  - $("div h3").addClass("yellow").hide("slow");
    - Finds all h3's that are inside a div, adds the CSS class named "yellow", then slowly makes them disappear

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Selecting DOM Elements: Simple Examples

- **$("#some-id")**
  - Return 1-element set (or empty set) of element that has that id
  - Simplest use, and very common for Ajax (note the "#")
- **$("p")**
  - Return all p elements
- **$(".blah")**
  - Return all elements that have class="blah"
- **$("li b span.blah")**
  - Return all <span class="blah"> elements that are inside b elements, that in turn are inside li elements

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Manipulating DOM Elements: Commonly Used Functions

- **$("#some-id").val()**
  - Returns value of input element. Used on 1-element sets.
- **$("selector").each(function)**
  - Calls function on each element. "this" set to element.
- **$("selector").addClass("name")**
  - Adds CSS class name to each. Also removeClass, toggleClass
- **$("selector").hide()**
  - Makes invisible (display: none). Also show, fadeOut, fadeIn, etc.
- **$("selector").click(function)**
  - Adds onclick handler. Also change, focus, mouseover, etc.
- **$("selector").html("<tag>some html</tag>")**
  - Sets the innerHTML of each element. Also append, prepend

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jQuery Selectors: Quick Example

Idea

- **Press button 1**
  - Change colors of certain elements
  - Make them disappear
- **Press button 2**
  - Make previously hidden elements reappear
- **Purpose**
  - Give quick intro to use of jQuery for manipulating the DOM
  - Little explanation now
  - Lots more explanation in later sections

Example: Randomizing Background Colors (JavaScript)

```
function randomizeHeadings() {
  $("h3").each(setRandomStyle);
  $("h3.green").hide("slow");
}


function setRandomStyle() {
  $(this).addClass(randomStyle());
}
```

Call setRandomStyle function on each h3 element

Slowly hide every h3 that has CSS style "green"

Add "red", "yellow" or "green" CSS names to each matching element

Example: Randomizing Background Colors (Continued)

```
function randomStyle() {
  var styles = ["red", "yellow", "green"];
  return(randomElement(styles));
}


function randomElement(array) {
  var index = Math.floor(Math.random()*array.length);
  return(array[index]);
}
```

Example: Randomizing Colors (Continued)

```
function revertHeadings() {
  $("h3.green").show("slow");
  $("h3").removeClass("red")
         .removeClass("yellow")
         .removeClass("green");
}


$(function() {
    $("#button1").click(randomizeHeadings);
    $("#button2").click(revertHeadings);
});
```

Runs when DOM is loaded. Explained in later section.

Sets onclick handlers

Example: Randomizing Colors (Style Sheet)

```
.red { background-color: red }
.yellow { background-color: yellow }
.green { background-color: green }

…
```

Names usecd by setRandomStyles function

Example: Randomizing Colors (HTML)

During development, renamed jquery-2.1.4.js to jquery.js and used it here.
For deployment, replaced it with renamed jquery-2.1.4.min.js

```
...
<head><title>jQuery Basics</title>
<link rel="stylesheet"
      href="css/styles.css"/>
<script src="scripts/jquery.js"></script>
<script src="scripts/jquery-basics.js"></script>
</head>
...
```

My file, containing code shown on previous slides. Should be loaded after the main jquery file.

Example: Randomizing Colors (HTML Continued)

```
…
<h3>Foo, bar, baz</h3>
<h3>Blah, blah, blah</h3>
<h3>Yadda, yadda, yadda</h3>
<h3>Foo, bar, baz</h3>
<h3>Blah, blah, blah</h3>
<h3>Yadda, yadda, yadda</h3>
<h3>Foo, bar, baz</h3>
<h3>Blah, blah, blah</h3>
<h3>Yadda, yadda, yadda</h3>
<input type="button" id="button1"
       value="Randomize Headings"/>
<input type="button" id="button2"
       value="Revert Headings"/>
```
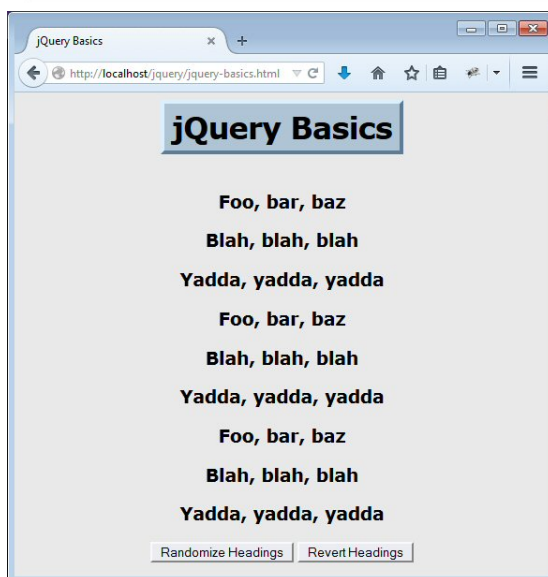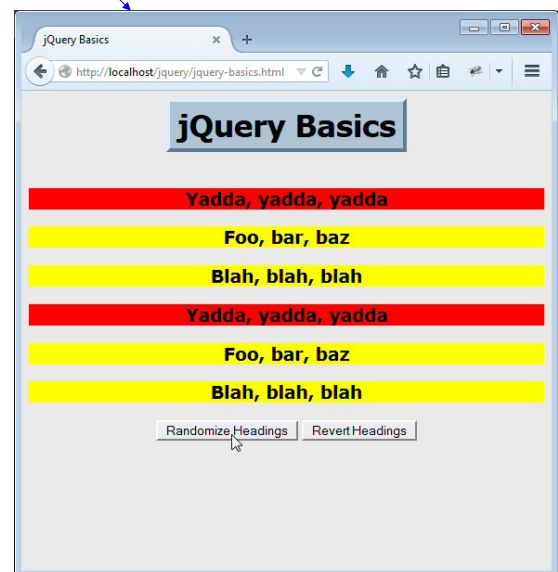
The ids to which click handlers are attached.

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Example: Randomizing Colors (Results)

After "Randomize Headings". Some headings turned green, then gradually disappeared.

When page originally loaded, or after "Revert Headings"

Understanding Operations on Sets of Elements

- **Instead of this**
  ```
  function randomizeHeadings() {
    $("h3").each(setRandomStyle);
    $("h3.green").hide("slow");
  }
  function setRandomStyle() {
    $(this).addClass(randomStyle());
  }
  ```
- **Why can't I simply do this?**
  ```
  function randomizeHeadings() {
    $("h3").addClass(randomStyle())
    $("h3.green").hide("slow");
  }
  ```

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Using "jQuery" instead of "$"

Equivalent Names

- **$**
  - Traditional name of main jQuery object, and the one we use throughout this tutorial
    - **$("h3").hide("slow");**
    - **$.ajax({ url: "relative-address", success: handlerFunc });**
- **jQuery**
  - Alternative and completely equivalent name. Introduced because some other JavaScript libraries (e.g., Prototype) also use the $ variable
    - **jQuery("h3").hide("slow");**
    - **jQuery.ajax({ url: "relative-address", success: handlerFunc });**
- **If you use another library that uses $**
  - Load jQuery second
  - Call jQuery.noConflict();
  - Use jQuery.blah instead of $.blah

Wrap-Up

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Summary

- **Rename jquery file and load it**
  - Rename jquery-2.1.x.js or jquery-2.1.x-min.js to jquery.js
- **Load HTML file**
  - Either in Firefox (with Firebug installed) or Chrome
  - HTML file should have some HTML elements and should load jquery.js
- **Bring up Firebug**
  - Or Chrome developer tools
- **Practice interactively**
  - Search for CSS selector patterns
    ```
    $("h1")
    $("#main-div ul ul li")
    ```
  - Hide or show matching elements
    ```
    $("#main-div ul ul li").hide("slow")
    ```

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Books and References

- ***jQuery in Action***
  - by Bear Bibeault, Yehuda Katz, and John Resig
- ***Pro jQuery 2.0***
  - by Adam Freeman
- **http://api.jquery.com/**
  - Very complete, but geared to specific methods
  - Moderate number of explicit examples
- **http://learn.jquery.com/**
  - Higher-level tutorials than the API site above
  - Growing rapidly in 2015

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Questions?

More info:
http://www.coreservlets.com/javascript-jquery-tutorial/ -- Tutorial on JavaScript, jQuery, and jQuery UI
http://courses.coreservlets.com/Course-Materials/java.html – General Java programming tutorial
http://www.coreservlets.com/java-8-tutorial/ – Java 8 tutorial
http://courses.coreservlets.com/java-training.html – Customized Java training courses, at public venues or onsite at *your* organization
http://coreservlets.com/ – JSF 2, PrimeFaces, Java 8, JavaScript, jQuery, Ext JS, Hadoop, RESTful Web Services, Android, HTML5, Spring, Hibernate, Servlets, JSP, GWT, and other Java EE training
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