jQuery

Succinctly

by Cody Lindley

Syncfusion | Technology Resource Portal

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By

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This publication was edited by the Syncfusion ASP.NET MVC Team, who provide advanced ASP.NET MVC frameworks for business applications to help you deliver innovation with ease. Check out samples online at http://mvc.syncfusion.com/sfmvctoolssamplebrowser.

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The Story behind the *Succinctly* Series of Books

Daniel Jebaraj, Vice President
Syncfusion, Inc.

Staying on the cutting edge

As many of you may know, Syncfusion is a provider of software components for the Microsoft platform. This puts us in the exciting but challenging position of always being on the cutting edge.

Whenever platforms or tools are shipping out of Microsoft, which seems to be about every other week these days, we have to educate ourselves, quickly.

Information is plentiful but harder to digest

In reality, this translates into a lot of book orders, blog searches, and Twitter scans.

While more information is becoming available on the Internet and more and more books are being published, even on topics that are relatively new, one aspect that continues to inhibit us is the inability to find concise technology overview books.

We are usually faced with two options: read several 500+ page books or scour the Web for relevant blog posts and other articles. Just as everyone else who has a job to do and customers to serve, we find this quite frustrating.

The *Succinctly* series

This frustration translated into a deep desire to produce a series of concise technical books that would be targeted at developers working on the Microsoft platform.

We firmly believe, given the background knowledge such developers have, that most topics can be translated into books that are between 50 and 100 pages.

This is exactly what we resolved to accomplish with the *Succinctly* series. Isn't everything wonderful born out of a deep desire to change things for the better?

The best authors, the best content

Each author was carefully chosen from a pool of talented experts who shared our vision. The book you now hold in your hands, and the others available in this series, are a result of the authors' tireless work. You will find original content that is guaranteed to get you up and running in about the time it takes to drink a few cups of coffee.

Free forever

Syncfusion will be working to produce books on several topics. The books will always be free. Any updates we publish will also be free.

Free? What is the catch?
There is no catch here. Syncfusion has a vested interest in this effort.

As a component vendor, our unique claim has always been that we offer deeper and broader frameworks than anyone else on the market. Developer education greatly helps us market and sell against competing vendors who promise to “enable AJAX support with one click,” or “turn the moon to cheese!”

Let us know what you think
If you have any topics of interest, thoughts, or feedback, please feel free to send them to us at succinctly@syncfusion.com.

We sincerely hope you enjoy this book and that it helps you better understand the topic of study. Thank you for reading.

About the Author

Cody Lindley is a Christian, husband, son, father, brother, outdoor enthusiast, and client-side engineer. Since 1997 he has been passionate about HTML, CSS, JavaScript, Flash, interaction design, interface design, and HCI. He is best known in the jQuery community for creating Thickbox, a modal/dialog solution. In 2008 he officially joined the jQuery team as an evangelist. His current focus is on client-side optimization techniques as well as speaking and writing about jQuery. He is currently employed by TandemSeven.

Introduction

jQuery Succinctly was written to express, in short-order, the concepts essential to intermediate and advanced jQuery development. Its purpose is to instill in you, the reader, practices that jQuery developers take as common knowledge. Each chapter contains concepts essential to becoming a seasoned jQuery developer.

This book is intended for three types of readers. The first is someone who has read introductory material on jQuery and is looking for the next logical step. The second type of reader is a JavaScript developer, already versed in another library, now trying to quickly learn jQuery. The third reader is I, the author. I crafted this book to be used as my own personal reference point for jQuery concepts. This is exactly the type of book I wish every JavaScript library had available.

Preface

Before you begin, it is important to understand the various stylistic nuances employed throughout this book. Please do not skip this section because it contains information that will aid you as you read.

jQuery semantics

The term "jQuery function" refers to the jQuery constructor function (`jQuery()` or alias `$()`) that is used to create an instance of the jQuery object.

The term "wrapper set" refers to DOM elements that are wrapped within jQuery methods. Specifically, this term is used to refer to the elements selected using the jQuery function. You may have heard this referred to as a "jQuery collection." In this book I will be using the term "wrapper set" instead of "jQuery collection."

How the book is structured

The book is organized into chapters loosely based on the arrangement of the jQuery API documentation. Each chapter contains isolated jQuery concepts relevant to the chapter's title.

More code, less words

This book is purposely written with the intention that the reader will examine the code examples closely. The text should be viewed as secondary to the code itself. It is my opinion that a code example is actually worth a thousand words. Do not worry if you initially find the explanations in the book to be confusing. Examine the code. Tinker with it. Reread the code comments. Repeat this process until the material becomes clear. This is the level of expertise I hope you achieve, where documented code is all that is necessary for you to understand new development concepts.

Why oh why did I use `alert()` for code examples?

Believe me, I hate the `alert()` method as much as you do. But like it or not, it works reliably in every browser. To borrow a line from Dr. Seuss: It works "Here, there, and everywhere!" It is not necessarily ideal, but I did not want the added complexity of `console` solutions to adversely affect code clarity. It is my goal to cut away any code overhead not directly supporting the concepts being taught.

Color coding

Code will be colored using normal JavaScript syntax highlighting (as in Visual Studio). This will help you understand the code, but you will be just fine reading this material on a monochrome eBook reader such as the Kindle.

Sample: color.html

```
<!DOCTYPE html>
<html lang="en">

    <body>
        <!-- HTML comment -->
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
            // JavaScript comment
            var focusOnThisCode = true;
        </script>
    </body>

</html>
```

Completely grok jQuery `text()` before reading this book

The code examples in this book make heavy use of the jQuery **`text()`** method. You need to be aware that the **`text()`** method, when used on a wrapper set containing more than one element, will actually combine and return a string of text contained in all elements of the wrapper set. This might be confusing if you were expecting it to return only the text in the first element of the wrapper set. Below is an example of how the **`text()`** method concatenates the strings found in the elements of a wrapper set.

Sample: grok-text.html

```
<!DOCTYPE html>
<html lang="en">

    <body>
        <span>I</span>
        <span>love</span>
        <span>jQuery</span>
        <span>!</span>
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
```

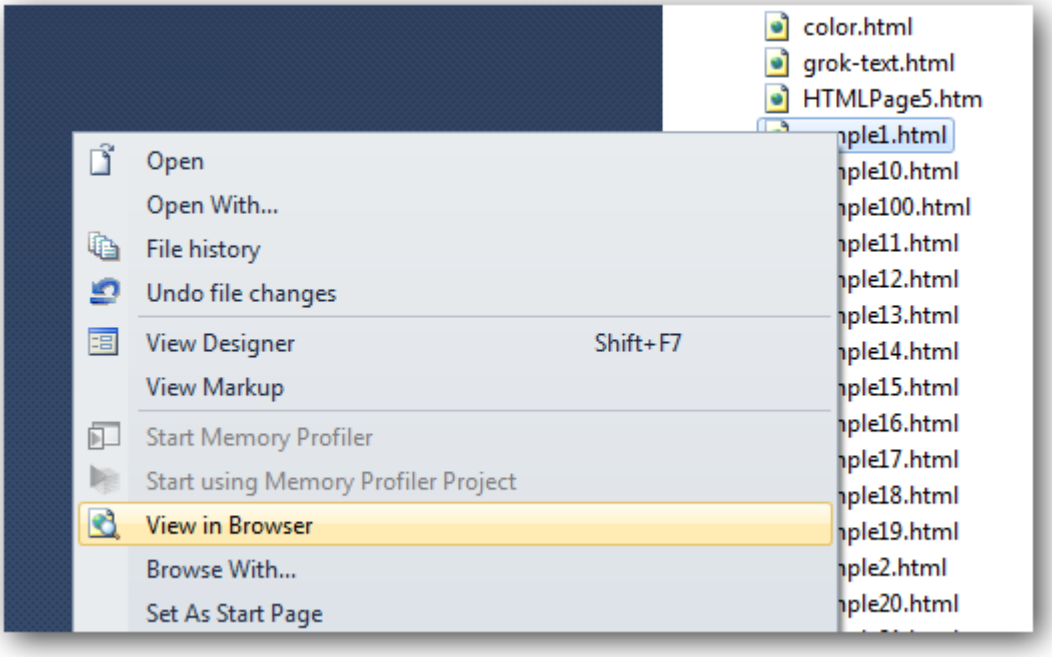
```
            alert(jQuery('span').text()); // Alerts "I love jQuery!"
        </script>
    </body>

</html>
```

Code examples

This book relies heavily on code examples to express jQuery concepts. The code samples are available at https://bitbucket.org/syncfusion/jquery-succinctly.

Code samples are provided as individual HTML files. A Visual Studio 2010 project is also provided for easy navigation. You can select any file, right-click, and select the **View in Browser** option to test the code.



The name of the sample file is always included above its code block in the format **Sample: $file-name.html**.

I encourage you to download the code and follow along. I authored this book counting on the fact that you will need to tinker with the code while you are reading and learning.

Chapter 1 Core jQuery

Base concept behind jQuery

While some conceptual variations exist (e.g. functions like **$.ajax**) in the jQuery API, the central concept behind jQuery is "find something, do something." More specifically, select DOM element(s) from an HTML document and then do something with them using jQuery methods. This is the big picture concept.

To drive this concept home, reflect upon the code below.

Sample: sample1.html

```
<!DOCTYPE html>
<html lang="en">

    <body>
        <!-- jQuery will change this -->
        <a href=""></a>
        <!-- to this <a href="http://www.jquery.com">jQuery.</a> -->
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
            jQuery('a').text('jQuery').attr('href', 'http://www.jquery.com');
        </script>
    </body>

</html>
```

Notice that in this HTML document we are using jQuery to select a DOM element (**<a>**). With something selected, we then do something with the selection by invoking the jQuery methods **text()**, **attr()**, and **appendTo()**.

The **text** method called on the wrapped **<a>** element and set the display text of the element to be “jQuery.” The **attr** call sets the **href** attribute to the jQuery Web site.

Grokking the "find something, do something" foundational concept is critical to advancing as a jQuery developer.

The concept, behind the concept, behind jQuery

While selecting something and doing something is the core concept behind jQuery, I would like to extend this concept to include creating something as well. Therefore, the concept behind jQuery could be extended to include first creating something new, selecting it, and then doing something with it. We could call this the concept, behind the concept, behind jQuery.

What I am trying to make obvious is that you are not stuck with only selecting something that is already in the DOM. It is additionally important to grok that jQuery can be used to create new DOM elements and then do something with these elements.

In the code example below, we create a new `<a>` element that is not in the DOM. Once created, it is selected and then manipulated.

Sample: sample2.html

```
<!DOCTYPE html>
<html lang="en">

    <body>
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
            jQuery('<a>jQuery</a>').attr('href', 'http://www.jquery.com').appendTo('b
ody');
        </script>
    </body>

</html>
```

The key concept to pick up here is that we are creating the `<a>` element on the fly and then operating on it as if it was already in the DOM.

jQuery requires HTML to run in standards mode or almost-standards mode

There are known issues with jQuery methods not working correctly when a browser renders an HTML page in quirks mode. Make sure when you are using jQuery that the browser interprets the HTML in standards mode or almost standards mode by using a valid doctype.

To ensure proper functionality, code examples in this book use the HTML 5 doctype.

```
<!DOCTYPE html>
```

Waiting on the DOM to be ready

jQuery fires a custom event named **ready** when the DOM is loaded and available for manipulation. Code that manipulates the DOM can run in a handler for this event. This is a common pattern seen with jQuery usage.

The following sample features three coded examples of this custom event in use.

Sample: sample3.html

```
<!DOCTYPE html>
<html lang="en">

    <head>
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
            // Standard.
            jQuery(document).ready(function () { alert('DOM is ready!'); });

            // Shortcut, but same thing as above.
            jQuery(function () { alert('No really, the DOM is ready!'); });

            // Shortcut with fail-safe usage of $. Keep in mind that a reference
            // to the jQuery function is passed into the anonymous function.
            jQuery(function ($) {
                    alert('Seriously its ready!');
                    // Use $() without fear of conflicts.
            });
        </script>
    </head>

    <body></body>

</html>
```

Keep in mind that you can attach as many **ready()** events to the document as you would like. You are not limited to only one. They are executed in the order they were added.

Executing jQuery code when the browser window is completely loaded

Typically, we do not want to wait for the **window.onload** event. That is the point of using a custom event like **ready()** that will execute code before the window loads, but after the DOM is ready to be traversed and manipulated.

However, sometimes we actually do want to wait. While the custom **ready()** event is great for executing code once the DOM is available, we can also use jQuery to execute code once the entire Web page (including all assets) is completely loaded.

This can be done by attaching a load event handler to the **window** object. jQuery provides the **load()** event method that can be used to invoke a function once the window is completely loaded. Below, I provide an example of the **load()** event method in use.

Sample: sample4.html

```
<!DOCTYPE html>
<html lang="en">

    <head>
        <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
        <script>
            // Pass window to the jQuery function and attach
            // event handler using the load() method shortcut.
            jQuery(window).load(function(){     alert('The page and all its assets
are loaded!'); });
        </script>
    </head>

    <body></body>

</html>
```

Include all CSS files before including jQuery

As of jQuery 1.3, the library no longer guarantees that all CSS files are loaded before it fires the custom **ready()** event. Because of this change in jQuery 1.3, you should always include all CSS files before any jQuery code. This will ensure that the browser has parsed the CSS before it moves on to the JavaScript included later in the HTML document. Of course, images that are referenced via CSS may or may not be downloaded as the browser parses the JavaScript.

Using a hosted version of jQuery

When embedding jQuery into a Web page, most people choose to download the source code and link to it from a personal domain/host. However, there are other options that involve someone else hosting the jQuery code for you.

Google hosts several versions of the jQuery source code with the intent of it being used by anyone. This is actually very handy. In the code example below I am using a `<script>` element to include a minified version of jQuery that is hosted by Google.

```
<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></scrip
t>
```

Google also hosts several previous versions of the jQuery source code, and for each version, minified and non-minified variants are provided. I recommend using the non-minified variant during development, as debugging errors is always easier when you are dealing with non-minified code.

A benefit of using a Google hosted version of jQuery is that it is reliable, fast, and potentially cached.

Executing jQuery code when DOM is parsed without using `ready()`

The custom `ready()` event is not entirely needed. If your JavaScript code does not affect the DOM, you can include it anywhere in the HTML document. This means you can avoid the `ready()` event altogether if your JavaScript code is not dependent on the DOM being intact.

Most JavaScript nowadays, especially jQuery code, will involve manipulating the DOM. This means the DOM has to be fully parsed by the browser in order for you to operate on it. This fact is why developers have been stuck on the `window.onload` roller coaster ride for a couple of years now.

To avoid using the `ready()` event for code that operates on the DOM, you can simply place your code in an HTML document before the closing `</body>` element. Doing so ensures the DOM is completely loaded, simply because the browser will parse the document from top to bottom. If you place your JavaScript code in the document after the DOM elements it manipulates, there is no need to use the `ready()` event.

In the example below, I have forgone the use of `ready()` by simply placing my script before the document body closes. This is the technique I use throughout this book and on the majority of sites I build.

Sample: sample5.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p>
```

```
        Hi, I'm the DOM! Script away!</p>
    <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></s
cript>
    <script>        alert(jQuery('p').text()); </script>
</body>
</html>
```

If I were to place the **<script>** before the **<p>** element, it would execute before the browser had loaded the **<p>** element. This would cause jQuery to assume the document does not contain any **<p>** elements. However, if I were to use the jQuery custom **ready()** event, then jQuery would not execute the code until the DOM was ready. But why do this, when we have control over the location of the **<script>** element in the document? Placing jQuery code at the bottom of the page avoids having to using the **ready()** event. In fact, placing all JavaScript code at the bottom of a page is a proven performance strategy.

Grokking jQuery chaining

Once you have selected something using the jQuery function and created a wrapper set, you can actually chain jQuery methods to the DOM elements contained inside the set. Conceptually, jQuery methods continue the chain by always returning the jQuery wrapper set, which can then be used by the next jQuery method in the chain. Note: Most jQuery methods are chainable, but not all.

You should always attempt to reuse the wrapped set by leveraging chaining. In the code below, the **text()**, **attr()**, and **addClass()** methods are being chained.

Sample: sample6.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a></a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     $('a').text('jQuery') // Sets text to jQuery, and then returns $('a').
      .attr('href', 'http://www.jquery.com/') // Sets the href attribute and then returns
$('a').
      .addClass('jQuery'); // Sets class and then returns $('a').
 })(jQuery) </script>
</body>
</html>
```

Breaking the chain with destructive methods

As mentioned before, not all jQuery methods maintain the chain. Methods like `text()` can be chained when used to set the text node of an element. However, `text()` actually breaks the chain when used to get the text node contained within an element.

In the example below, `text()` is used to set and then get the text contained within the `<p>` element.

Sample: sample7.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p></p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
    var theText = $('p').text('jQuery').text(); // Returns the string "jQuery".
     alert(theText);
     // Cannot chain after text(). The chain is broken.
     // A string is returned, not the jQuery object.
 })(jQuery) </script>
</body>
</html>
```

Getting the text contained within an element using `text()` is a prime example of a broken chain because the method will return a string containing the text node, but not the jQuery wrapper set.

It should be no surprise that if a jQuery method does not return the jQuery wrapper set, the chain is thereby broken. This method is considered to be destructive.

Using destructive jQuery methods and exiting destruction using `end()`

jQuery methods that alter the original jQuery wrapper set selected are considered to be destructive. The reason is that they do not maintain the original state of the wrapper set. Not to worry; nothing is really destroyed or removed. Rather, the former wrapper set is attached to a new set.

However, fun with chaining does not have to stop once the original wrapped set is altered. Using the `end()` method, you can back out of any destructive changes made to the original wrapper set. Examine the usage of the `end()` method in the following example to understand how to operate in and out of DOM elements.

Sample: sample8.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <style>
        .last
        {
            background: #900;
        }
    </style>
    <ul id="list">
        <li></li>
        <li>
            <ul>
                <li></li>
                <li></li>
                <li></li>
            </ul>
        </li>
        <li></li>
        <li></li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('#list') // Original wrapper set.
        .find('> li') // Destructive method.
            .filter(':last') // Destructive method.
                .addClass('last')
            .end() // End .filter(':last').
            .find('ul') // Destructive method.
                 .css('background', '#ccc')
                .find('li:last') // Destructive method.
                    .addClass('last')
                .end() // End .find('li:last')
            .end() // End .find('ul')
        .end() // End .find('> li')
        .find('li') // Back to the orginal $('#list')
            .append('I am an &lt;li&gt;');
  })(jQuery); </script>
</body>
</html>
```

Aspects of the jQuery function

The jQuery function is multifaceted. We can pass it differing values and string formations that it can then use to perform unique functions. Here are several uses of the jQuery function:

- Select elements from the DOM using CSS expressions and custom jQuery expressions, as well as selecting elements using DOM references: `jQuery('p > a')` or `jQuery(':first')` and `jQuery(document.body)`
- Create HTML on the fly by passing HTML string structures or DOM methods that create DOM elements: `jQuery('<div id="nav"></div>')` or `jQuery(document.createElement('div')`
- A shortcut for the `ready()` event by passing a function to the jQuery function: `jQuery(function($){ /* Shortcut for ready() */ })`

Each of these usages is detailed in the code example below.

Sample: sample9.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  jQuery(function($){ // Pass jQuery a function.
      // Pass jQuery a string of HTML.
      $('<p></p>').appendTo('body');
      // Pass jQuery an element reference.
      $(document.createElement('a')).text('jQuery').appendTo('p');
      // Pass jQuery a CSS expression.
      $('a:first').attr('href', 'http://www.jquery.com');
      // Pass jQuery a DOM reference.
      $(document.anchors[0]).attr('jQuery');
  }); </script>
</body>
</html>
```

Grokking when the keyword `this` refers to DOM elements

When attaching events to DOM elements contained in a wrapper set, the keyword `this` can be used to refer to the current DOM element invoking the event. The following example contains jQuery code that will attach a custom `mouseenter` event to each `<a>` element in the page. The native JavaScript `mouseover` event fires when the cursor enters or exits a child element, whereas jQuery's `mouseenter` does not.

Sample: sample10.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a id="link1">jQuery.com</a>
    <a id="link2">jQuery.com</a>
    <a id="link3">jQuery.com</a>
```

```
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($)
    {
      $('a').mouseenter(
          function () { alert(this.id); });
    })(jQuery);
    </script>
</body>
</html>
```

Inside the anonymous function that is passed to the **mouseenter()** method, we use the keyword **this** to refer to the current **<a>** element. Each time the mouse touches the "jQuery.com" text, the browser will alert which element has been moused-over by identifying its **id** attribute value.

In the previous example, it is also possible to take the **this** reference and pass it to the jQuery function so that the DOM element is wrapped with jQuery functionality.

So instead of this:

```
// Access the ID attribute of the DOM element.
alert(this.id);
```

We could have done this:

```
// Wrap the DOM element with a jQuery object,
// and then use attr() to access ID value.
alert($(this).attr('id'));
```

This is possible because the jQuery function not only takes selector expressions, it will also take references to DOM elements. In the code, **this** is a reference to a DOM element.

The reason you might want to wrap jQuery functionality around a DOM element should be obvious. Doing so gives you the ability to use jQuery chaining, should you have need for it.

Iterating over a set of elements contained in the jQuery wrapper set is somewhat similar to the concept we just discussed. By using the jQuery **each()** method, we can iterate over each DOM element contained in a wrapper set. This allows access to each DOM element individually, via the usage of the **this** keyword.

Building upon the markup in the previous example, we can select all **<a>** elements in the page and use the **each()** method to iterate over each **<a>** element in the wrapper set, accessing its **id** attribute. Here is an example.

Sample: sample11.html

```
<!DOCTYPE html>
<html lang="en">
<body><a id="link1">jQuery.com</a> <a id="link2">jQuery.com</a> <a
id="link3">jQuery.com</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('a').each(function(){
          // Loop that alerts the id value for every <a> in the page.
          alert($(this).attr('id')); // "this" refers to the current element in the loop.
      });
  })(jQuery); </script>
</body>
</html>
```

If you were to load the HTML in a browser, the browser would alert for the **id** value of each **<a>** element in the page. Since there are three **<a>** elements in the page, you get three iterations via the **each()** method and three alert windows.

Extracting elements from a wrapper set, using them directly without jQuery

Just because you wrap jQuery functionality around an HTML element does not mean you lose access to the actual DOM element itself. You can always extract an element from the wrapper set and operate on the element via native JavaScript. For example, in the code below I am setting the title attribute of the **<a>** element in the HTML page by manipulating the native title property of the **<a>** DOM element.

Sample: sample12.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a>jQuery.com</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
       // Using DOM node properties to set the title attribute.
       $('a').get(0).title = 'jQuery.com';
       // Manipulation of DOM element using jQuery methods.
       $('a').attr('href', 'http://www.jquery.com');
   })(jQuery);
    </script>
```

```
</body>
</html>
```

As demonstrated, jQuery provides the handy `get()` method for accessing DOM elements at a specific index in the wrapper set.

But there is another option here. You can avoid using the `get()` method by simply using the square bracket array notation on the jQuery object itself. In the context of our prior code example:

This code:

```
$('a').get(0).title = 'jQuery.com';
```

Could become this:

```
$('a')[0].title = 'jQuery.com';
```

Both allow access to the actual DOM element. Personally, I prefer square bracket notation. It is faster because it uses native JavaScript to retrieve the element from an array, instead of passing it to a method.

However, the `get()` method provides a slick solution for placing all of the DOM elements into a native array. By simply calling the `get()` method without passing it an index parameter, the method will return all of the DOM elements in the wrapper set in a native JavaScript array.

To demonstrate, let's take `get()` for a test drive. In the code below, I am placing all the `<a>` elements into an array. I then use the array to access the title property of the third `<a>` DOM object on the page.

Sample: sample13.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a href="http://www.jquery.com" title="anchor1">jQuery.com</a>
    <a href="http://www.jquery.com" title="anchor2">jQuery.com</a>
    <a href="http://www.jquery.com" title="anchor3">jQuery.com</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      var arrayOfAnchors = $('a').get(); // Create native array from wrapper set.
      alert(arrayOfAnchors[2].title); // Alerts the third link.
        })
```

```
      (jQuery);
    </script>
</body>
</html>
```

Notes:
Using `get()` will end jQuery's chaining. It will take the wrapper set and change it into a simple array of DOM elements that are no longer wrapped with jQuery functionality. Therefore, using the `.end()` method cannot restore chaining after `.get()`.

Checking to see if the wrapper set is empty

Before you begin to operate on a wrapper set, it is logical to check that you have, in fact, selected something. The simplest solution is to use an `if` statement to check if the wrapper set contains any DOM elements.

Sample: sample14.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a>jQuery</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>
        if (jQuery('a').get(0)) { // Is there an element in the set?
            jQuery('a').attr('href', 'http://www.jquery.com');
        }
        if (jQuery('a').length) { // Check the length of the set. Can also use .size()
            jQuery('a').attr('title', 'jQuery');
        }  </script>
</body>
</html>
```

The truth of the matter is the above `if` statements are not totally necessary, because jQuery will fail silently if no elements are found. However, each method chained to any empty wrapper set still gets invoked. So while we could actually forgo the use of the `if` statements, it is likely a good rule of thumb to use them. Invoking methods on an empty wrapper set could potentially cause unnecessary processing, as well as undesirable results if methods return values other than the wrapper set, and those values are acted upon.

Creating an alias by renaming the jQuery object itself

jQuery provides the `noConflict()` method, which has several uses—namely, the ability to replace `$` with another alias. This can be helpful in three ways: It can relinquish the use of the `$` sign to another library, help avoid potential conflicts, and provide the ability to customize the namespace/alias for the jQuery object.

For example, let's say that you are building a Web application for company XYZ. It might be nice to customize jQuery so that instead of having to use `jQuery('div').show()` or `$('div').show()` you could use `XYZ('div').show()` instead.

Sample: sample15.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>Syncfusion., Inc.</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>
        var Syncfusion = jQuery.noConflict();
        // Do something with jQuery methods.
        alert(Syncfusion("div").text());
    </script>
</body>
</html>
```

Notes:
By passing the `noConflict()` function a Boolean value of true, you can completely undo what jQuery has introduced into the Web page. This should only be used in extreme cases because it will, more than likely, cause issues with jQuery plugins.

Using `.each()` when implicit iteration is not enough

Hopefully, it is obvious that if you have an HTML page (example below) with three empty `<div>` elements, the following jQuery statement will select all three elements on the page, iterate over the three elements (implicit iteration), and will insert the text "I am a div" in all three `<div>` elements.

Sample: sample16.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div></div>
```

```
    <div></div>
    <div></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('div').text('I am a div');
  })(jQuery);
    </script>
</body>
</html>
```

This is considered implicit iteration because jQuery code assumes you would like to manipulate all three elements, which requires iterating over the elements selected and setting the text node value of each ** ** with the text "I am a div." When this is done by default, it is referred to as implicit iteration.

This is pretty handy. For the most part, the majority of the jQuery methods will apply implicit iteration. However, other methods will only apply to the first element in the wrapper set. For example, the jQuery method **attr()** will only access the first element in the wrapper set when used to get an attribute value.

Notes:
When using the **attr()** method to set an attribute, jQuery will actually apply implicit iteration to set the attribute and its value to all the elements in the wrapper set.

In the code below, the wrapper set contains all ** ** elements in the page, but the **attr()** method only returns the **id** value of the first element contained in the wrapper set.

Sample: sample17.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="div1">I am a div</div>
    <div id="div2">I am a div</div>
    <div id="div3">I am a div</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Alerts attribute value for first element in wrapper set.
      alert($('div').attr('id')); // Alerts "div1".
  })(jQuery); </script>
</body>
</html>
```

For the sake of demonstration, assume your goal is actually to get the **id** attribute value for each element on the page. You could write three separate jQuery statements accessing each ** ** element's **id** attribute value. If we were to do that, it might look something like this:

```
$('#div1').attr('id');
$('#div2').attr('id');
$('#div3').attr('id');
// or
var $divs = $('div'); // Cached query.
$divs.eq(0).attr('id'); // Start with 0 instead of 1.
$divs.eq(1).attr('id');
$divs.eq(2).attr('id');
```

That seems a bit verbose, no? Wouldn't it be nice if we could loop over the wrapper set and simply extract the **id** attribute value from each of the ** ** elements? By using the **$().each()** method, we invoke another round of iteration when our wrapper set requires explicit iteration to handle multiple elements.

In the code example below, I use the **$().each()** method to loop over the wrapper set, access each element in the set, and then extract its **id** attribute value.

Sample: sample18.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="div1">div1</div>
    <div id="div2">div2</div>
    <div id="div3">div3</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // 3 alerts, one for each div.
      $('div').each(function(){
          // "this" is each element in the wrapper set.
          alert($(this).attr('id'));
          // Could also be written: alert(this.id);
        });
      })(jQuery);

    </script>
</body>
</html>
```

Imagine the possibilities ahead of you with the ability to enforce iteration anytime you please.

Notes:
jQuery also provides a `$.each` function, not to be confused with the `$().each` method, which is used specifically to iterate over a jQuery wrapper set. The `$.each` method can actually be used to iterate over any old JavaScript array or object. It is essentailly a substitue for native JavaScript loops.

Elements in jQuery wrapper set returned in document order

The selector engine will return results in document order as opposed to the order in which the selectors were passed in. The wrapper set will be populated with the selected elements based on the order each element appears in the document, from top to bottom.

Sample: sample19.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <h1>h1</h1>
    <h2>h2</h2>
    <h3>h3</h3>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // We pass in h3 first, but h1 appears earlier in
      // the document, so it is first in the wrapper set.
      alert($('h3, h2, h1').get(0).nodeName);
      // Alerts "H1".
  })(jQuery);
    </script>
</body>
</html>
```

Determining context used by the jQuery function

The default context used by the jQuery function when selecting DOM elements is the document element (e.g. `$('a', document)`). This means that if you do not provide the jQuery function (e.g. `jQuery()`) with a second parameter to be used as the context for the DOM query, the default context used is the document element, more commonly known as `<body>`.

It is possible to determine the context in which the jQuery function is performing a DOM query by using the **context** property. Below I show two coded examples of retrieving the value of the context property.

Sample: sample20.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>
        <div>
            <div id="context"><a href="#">jQuery</a>         </div>
        </div>
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "object HTMLDocument" in Firefox.
      // Same as $('a', document).context;
      alert($('a').context);
      // Alerts "object HTMLDivElement" in Firefox.
      alert($('a', $('#context')[0]).context);
  })(jQuery); </script>
</body>
</html>
```

Creating entire DOM structure, including DOM events, in a single chain

By leveraging chaining and jQuery methods, you can create not only a single DOM element, but entire DOM structures. Below I create an unordered list of jQuery links that I then add to the DOM.

Sample: sample21.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      jQuery('<ul></ul>')
          .append('<li><a>jQuery.com</a></li><li><a>jQuery Documentation</a></li>')
          .find('a:first')
          .attr('href', 'http://www.jquery.com')
          .end()
          .find('a:eq(1)')
```

```
            .attr('href', 'http://docs.jquery.com')
            .end()
            .find('a')
            .click(function () { return confirm('Leave this page?'); })
            .end()
            .appendTo('body');
  })(jQuery); </script>
</body>
</html>
```

The concept you need to take away from the previous example is that jQuery can be used to craft and operate complex DOM structures. Using jQuery methods alone, you can whip up most any DOM structure you might need.

Custom jQuery filters can select elements when used alone

It is not necessary to provide an actual element in conjunction with a filter, such as `$('div:hidden')`. It is possible to simply pass the filter alone, anywhere a selector expression is expected.

Some examples:

```
// Selects all hidden elements
$(':hidden');
// Selects all div elements, then selects only even elements
$('div').filter(':even');
```

Grokking the `:hidden` and `:visible` filter

The custom jQuery selector filters `:hidden` and `:visible` do not take into account the CSS visibility property as one might expect. The way jQuery determines if an element is hidden or visible is if the element consumes any space in the document. To be exact, an element is visible if its browser-reported `offsetWidth` or `offsetHeight` is greater than 0. That way, an element that might have a CSS `display` value of `block` contained in an element with a `display` value of `none` would accurately report that it is not visible.

Examine the code carefully and make sure you understand why the value returned is `true` even though the `<div>` being selected has an inline style of `display:block`.

Sample: sample22.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="parentDiv" style="display: none;">
        <div id="childDiv" style="display: block;"></div>
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
            // Returns true because the parent div is hidden, so the
            // encapsulated div reports zero offsetWidth and offsetHeight.
      alert($('#childDiv').is(':hidden'));
  })(jQuery); </script>
</body>
</html>
```

Using the `is()` method to return a Boolean value

It is often necessary to determine if the selected set of elements does, in fact, contain a specific element. Using the `is()` method, we can check the current set against an expression/filter. The check will return `true` if the set contains at least one element that is selected by the given expression/filter. If it does not contain the element, a `false` value is returned. Examine the following code:

Sample: sample23.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="i0">jQuery</div>
    <div id="i1">jQuery</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Returns true.
      alert($('div').is('#i1'));
      // Returns false. Wrapper set contains no <div> with id="i2".
      alert($('div').is('#i2'));
      // Returns false. Wrapper set contains no hidden <div>
      alert($('div').is(':hidden'));
  })(jQuery); </script>
</body>
</html>
```

It should be apparent that the second `alert()` will return a value of false because our wrapper set did not contain a `<div>` that had an `id` attribute value of `i2`. The `is()` method is quite handy for determining if the wrapper set contains a specific element.

Notes:
As of jQuery 1.3, the `is()` method supports all expressions. Previously, complex expressions such as those containing hierarchy selectors (such as `+`, `~`, and `>`) always returned `true`. Filter is used by other internal jQuery functions. Therefore, all rules that apply there, apply here, as well.
Some developers use `is('.class')` to determine if an element has a specific class. Don't forget that jQuery already has a method for doing this called `hasClass('class')`, which can be used on elements that contain more than one class value. But truth be told, `hasClass()` is just a convenient wrapper for the `is()` method.

You can pass jQuery more than one selector expression

You can provide the jQuery function's first parameter several expressions separated by a comma: **`$('expression, expression, expression')`**. In other words, you are not limited to selecting elements using only a single expression. For example, in the example below, I am passing the jQuery function three expressions separated by a comma.

Sample: sample24.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>jQuery </div>
    <p>is the </p>
    <ul>
        <li>best!</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts jQuery is the best!
      alert($('div, p, ul li').text());
      // Inefficient way. Alerts jQuery is the best!
      alert($('div').text() + $('p').text() + $('ul li').text());
  })(jQuery); </script>
</body>
</html>
```

Each of these expressions selects DOM elements that are all added to the wrapper set. We can then operate on these elements using jQuery methods. Keep in mind that all the selected elements will be placed in the same wrapper set. An inefficient way to do this would be to call the jQuery function three times, once for each expression.

Checking wrapper set `.length` to determine selection

It is possible to determine if your expression has selected anything by checking if the wrapper set has a length. You can do so by using the array property **`length`**. If the **`length`** property does not return 0, then you know at least one element matches the expression you passed to the jQuery function. For example, in the code below we check the page for an element with an **`id`** of "notHere." Guess what? It is not there!

Sample: sample25.html

```
<!DOCTYPE html>
<html lang="en">
```

```
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Alerts "0".
      alert($('#notHere').length);
  })(jQuery); </script>
</body>
</html>
```

Notes:
If it is not obvious, the length property can also report the number of elements in the wrapper set—stated another way, how many elements were selected by the expression passed to the jQuery function.

Creating custom filters for selecting elements

The capabilities of the jQuery selector engine can be extended by creating your own custom filters. In theory, all you are doing here is building upon the custom selectors that are already part of jQuery. For example, say we would like to select all elements on a Web page that are absolutely positioned. Since jQuery does not already have a custom **`:positionAbsolute`** filter, we can create our own.

Sample: sample26.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="position: absolute">absolute</div>
    <span style="position: absolute">absolute</span>
    <div>static</div>
    <div style="position: absolute">absolute</div>
    <div>static</div>
    <span style="position: absolute">absolute</span>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Define custom filter by extending $.expr[':']
     $.expr[':'].positionAbsolute = function (element)
     { return $(element).css('position') === 'absolute'; };
     // How many elements in the page are absolutely positioned?
     alert($(':positionAbsolute').length); // Alerts "4"
     // How many div elements are absolutely positioned?
     alert($('div:positionAbsolute').length); // Alerts "2".
```

```
 })(jQuery); </script>
</body>
</html>
```

The most important thing to grasp here is that you are not limited to the default selectors provided by jQuery. You can create your own. However, before you spend the time creating your own version of a selector, you might just simply try the `filter()` method with a specified filtering function. For example, I could have avoided writing the `:positionAbsolute` selector by simply filtering the `<div>` elements in my prior example with a function I pass to the `filter()` method.

```
// Remove <div> elements from the wrapper
// set that are not absolutely positioned
$('div').filter(function () { return $(this).css('position') === 'absolute'; });
// or
// Remove all elements from the wrapper
// set that are not absolutely positioned
$('*').filter(function () { return $(this).css('position') === 'absolute'; });
```

Notes:
For additional information about creating your own selectors I suggest the following read:
http://www.bennadel.com/blog/1457-How-To-Build-A-Custom-jQuery-Selector.htm

Differences between filtering by numeric order vs. DOM relationships

jQuery provides filters for filtering a wrapper set by an element's numerical context within the set.

These filters are:

- :first
- :last
- :even
- :odd
- :eq(index)
- :gt(index)
- :lt(index)

Notes:
Filters that filter the wrapper set itself do so by filtering elements in the set at a starting point of 0, or index of 0. For example `:eq(0)` and `:first` access the first element in the set—`$('div:eq(0)')`—which is at a 0 index. This is in contrast to the `:nth-child` filter that is

one-indexed. Meaning, for example, `:nth-child(1)` will return the first child element, but trying to use `:nth-child(0)` will not work. Using `:nth-child(0)` will always select nothing.

Using `:first` will select the first element in the set while `:last` will select the last element in the set. Remember that they filter the set based on the relationship (numerical hierarchy starting at 0) within the set, but not the elements' relationships in the context of the DOM. Given this knowledge, it should be obvious why the filters `:first`, `:last`, and `:eq(index)` will always return a single element.

If it is not obvious, allow me to explain further. The reason that `:first` can only return a single element is because there can only be one element in a set that is considered first when there is only one set. This should be fairly logical. Examine the code below to see this concept in action.

Sample: sample27.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul>
        <li>1</li>
        <li>2</li>
        <li>3</li>
        <li>4</li>
        <li>5</li>
    </ul>
    <ul>
        <li>6</li>
        <li>7</li>
        <li>8</li>
        <li>9</li>
        <li>10</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Remember that text() combines the contents of all
     // elements in the wrapper set into a single string.
     alert('there are ' + $('li').length + ' elements in the set');
     // Get me the first element in the set.
     alert($('li:first').text()); // Alerts "1".
     // Get me the last element in the set.
     alert($('li:last').text()); // Alerts "10"
     // Get me the 6th element in the set, 0 based index.
     alert($('li:eq(5)').text()); // Alerts "6".
 })(jQuery); </script>
</body>
</html>
```

With a clear understanding of manipulating the set itself, we can augment our understanding of selecting elements by using filters that select elements that have unique relationships with other elements within the actual DOM. jQuery provides several selectors to do this. Some of these selectors are custom, while some are well known CSS expressions for selecting DOM elements.

- ancestor descendant
- parent > child
- prev + next
- prev ~ siblings
- :nth-child(selector)
- :first-child
- :last-child
- :only-child
- :empty
- :has(selector)
- :parent

Usage of these selector filters will select elements based on their relationship within the DOM as pertaining to other elements in the DOM. To demonstrate this concept, let's look at some code.

Sample: sample28.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul>
        <li>1</li>
        <li>2</li>
        <li>3</li>
        <li>4</li>
        <li>5</li>
    </ul>
    <ul>
        <li>1</li>
        <li>2</li>
        <li>3</li>
        <li>4</li>
        <li>5</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Remember that text() combines the contents of all
     // elements in the wrapper set into a single string.
     alert($('li:nth-child(2)').text()); // Alerts "22".
```

```
    alert($('li:nth-child(odd)').text()); // Alerts "135135".
    alert($('li:nth-child(even)').text()); // Alerts "2424".
    alert($('li:nth-child(2n)').text()); // Alerts "2424".
 })(jQuery); </script>
</body>
</html>
```

If you are surprised by the fact that **`$('li:nth-child(odd)').text()`** returns the value 135135, you are not yet grokking relationship filters. The statement, **`$('li:nth-child(odd)')`** said verbally would be "find all **`<li>`** elements in the Web page that are children, and then filter them by odd children." Well, it just so happens that there are two structures in the page that have a grouping of siblings made up of **`<li>`**s. My point is this: The wrapper set is made up of elements based on a filter that takes into account an element's relationship to other elements in the DOM. These relationships can be found in multiple locations.

The concept to take away is that not all filters are created equally. Make sure you understand which ones filter based on DOM relationships—e.g. **`:only-child`**—and which ones filter by the elements' position—e.g. **`:eq()`**—in the wrapped set.

Selecting elements by `id` when the value contains meta-characters

jQuery selectors use a set of meta-characters (e.g. **`# ~ [] = >`**) that when used as a literal part of a name (e.g. **`id="#foo[bar]"`**) should be escaped. It is possible to escape characters by placing two backslashes before the character. Examine the code below to see how using two backslashes in the selection expression allows us to select an element with an id attribute value of **`#foo[bar]`**.

Sample: sample29.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="#foo[bar]">jQuery</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "jQuery"
      alert($('#\\#foo\\[bar\\]').text());
  })(jQuery);
    </script>
</body>
</html>
```

Here is the complete list of characters that need to be escaped when used as a literal part of a name.

- #
- ;
- &
- ,
- .
- +
- *
- ~
- '
- :
- "
- !
- ^
- $
- [
-]
- (
-)
- =
- >
- |
- /

Stacking selector filters

It is possible to stack selector filters—e.g. `a[title="jQuery"][href^="http://"]`. The obvious example of this is selecting an element that has specific attributes with specific attribute values. For example, the jQuery code below will only select `<a>` elements in the HTML page that:

- Contain an `href` attribute with a starting value of "http://"
- Have a `title` attribute with a value of "jQuery"

Only one `<a>` is being selected.

Sample: sample30.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a title="jQuery">jQuery.com</a>
```

```
    <a href="http://www.jquery.com" title="jQuery" class="foo">jQuery.com 1</a>

    <a href="">jQuery.com</a>

    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>
        (function ($) {
            // Alerts "1"
            alert($('a[title="jQuery"][href^="http://"]').length);
        })(jQuery);
    </script>
</body>
</html>
```

Notice in the code how we have stacked two filters to accomplish this selection.

Other selector filters can be stacked besides just attribute filters. For example:

```
// Select the last <div> contained in the
// wrapper set that contains the text "jQuery".
$('div:last:contains("jQuery")')
// Get all check boxes that are both visible and selected.
$(':checkbox:visible:checked')
```

The concept to take away is that selector filters can be stacked and used in combination.

Notes:
You can also nest and stack filters—e.g. `$('p').filter(':not(:first):not(:last)')`.

Nesting selector filters

Selector filters can be nested. This enables you to wield filters in a very concise and powerful manner. Below, I give an example of how you can nest filters to perform complex filtering.

Sample: sample31.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>javascript</div>
    <div><span class="jQuery">jQuery</span></div>
    <div>javascript</div>
    <div><span class="jQuery">jQuery</span></div>
```

```
    <div>javascript</div>
    <div><span class="jQuery">jQuery</span></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Select all div's, remove all div's that have a child element with class="jQuery".
     alert($('div:not(:has(.jQuery))').text()); // Alerts combined text of all div's.
     // Select all div's, remove all div's that are odd in the set (count starts at 0).
     alert($('div:not(:odd)').text()); // Alerts combined text of all div's.
 })(jQuery); </script>
</body>
</html>
```

The concept to take away is that selector filters can be nested.

Notes:
You can also nest and stack filters—e.g. `$('p').filter(':not(:first):not(:last)')`

Grokking the `:nth-child()` filter

The `:nth-child()` filter has many uses. For example, say you only want to select every third `<li>` element contained within a `<ul>` element. It is possible with the `:nth-child()` filter. Examine the following code to get a better understanding of how to use the `:nth-child()` filter.

Sample: sample32.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul>
        <li>1</li>
        <li>2</li>
        <li>3</li>
        <li>4</li>
        <li>5</li>
        <li>6</li>
        <li>7</li>
        <li>8</li>
        <li>9</li>
        <li>10</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Remember that text() combines the contents of all
     // elements in the wrapper set into a single string.
```

```
    // By index.
    alert($('li:nth-child(1)').text()); // Alerts "1".
    // By even.
    alert($('li:nth-child(even)').text()); // Alerts "246810".
    // By odd.
    alert($('li:nth-child(odd)').text()); // Alerts "13579".
    // By equation.
    alert($('li:nth-child(3n)').text()); // Alerts "369".
    // Remember this filter uses a 1 index.
    alert($('li:nth-child(0)').text()); // Alerts nothing. There is no 0 index.
 })(jQuery); </script>
</body>
</html>
```

Selecting elements by searching attribute values using regular expressions

When the jQuery attribute filters used to select elements are not robust enough, try using regular expressions. James Padolsey has written a nice extension to the filter selectors that will allow us to create custom regular expressions for filtering. I have provided a code example here, but make sure you also check out the article on http://james.padolsey.com for all the details.

Sample: sample33.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="123"></div>
    <div id="oneTwoThree"></div>
    <div id="0"></div>
    <div id="zero"><div>

<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
<script>  (function ($) {
      //James Padolsey filter extension.
      jQuery.expr[':'].regex = function (elem, index, match) {
          var matchParams = match[3].split(','), validLabels = /^(data|css):/, attr = {
method: matchParams[0].match(validLabels) ? matchParams[0].split(':')[0] : 'attr',
property: matchParams.shift().replace(validLabels, '') }, regexFlags = 'ig', regex = new
RegExp(matchParams.join('').replace(/^\s+|\s+$/g, ''), regexFlags);
          return regex.test(jQuery(elem)[attr.method](attr.property));
      }
      // Select div's where the id attribute contains numbers.
      alert($('div:regex(id,[0-9])').length); // Alerts "2".
      // Select div's where the id attribute contains the string "Two".
      alert($('div:regex(id, Two)').length); // Alerts "1".
```

```
  })(jQuery); </script>
</body>
</html>
```

Difference between selecting direct children vs. all descendants

Direct children elements only can be selected by using the combiner `>` or by way of the `children()` traversing method. All descendants can be selected by using the `*` CSS expression. Make sure you clearly understand the difference between the two. The example below demonstrates the differences.

Sample: sample34.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>
        <p><strong><span>text</span></strong></p>
        <p><strong><span>text</span></strong></p>
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Each statement alerts "2" because there are
      // two direct child <p> elements inside of <div>.
      alert($('div').children().length);
      // or
      alert($('>*', 'div').length);
      alert($('div').find('>*').length);

      // Each statement alerts 6 because the <div> contains
      // 6 descendants, not including the text node.
      alert($('div').find('*').length);
      // or
      alert($('*', 'div').length);
  })(jQuery); </script>
</body>
</html>
```

Selecting direct child elements when a context is already set

It is possible to use the combiner `>` without a context to select direct child elements when a context has already been provided. Examine the code below.

Sample: sample35.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul id="firstUL">
        <li>text</li>
        <li>
            <ul id="secondUL">
                <li>text</li>
                <li>text</li>
            </ul>
        </li>
        <li>text</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Select only the direct <li> children. Alerts "3".
      alert($('ul:first').find('> li').length);  // or
      alert($('> li', 'ul:first').length);
  }
      )(jQuery); </script>
</body>
</html>
```

Basically, **`'> element'`** can be used as an expression when a context has already been determined.

Difference between `find()` and `filter()` methods

The `filter()` method is used to filter the current set of elements contained within the wrapper set. Its usage should be left to tasks that require filtering a set of elements that are already selected. For example, the code below will filter the three `<p>` elements contained in the wrapper set.

Sample: sample36.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p><strong>first</strong></p>
    <p>middle</p>
    <p><strong>last</strong></p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {  // Alerts middle, by filtering out the first
      // and last <p> elements in the wrapper set.
      alert($('p').filter(':not(:first):not(:last)').text());
  })(jQuery); </script>
</body>
</html>
```

Notes:
When using `filter()`, always ask yourself if it is absolutely necessary. For example, `$('p').filter(':not(:first):not(:last)')` could be written without `filter()` by passing the jQuery function the expressions as custom selectors `$('p:not(:first):not(:last)')`.

The `find()` method, on the other hand, can be used to further find descendants of the currently selected elements. Think of `find()` more like updating or changing the current wrapped set with new elements that are encapsulated within the elements that are already selected. For example, the code below will change the wrapped set from `<p>` elements to two `<strong>` elements by using `find()`.

Sample: sample37.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p><strong>first</strong></p>
```

```
    <p>middle</p>
    <p><strong>last</strong></p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "strong".
      alert($('p').find('strong').get(0).nodeName);
  })(jQuery); </script>
</body>
</html>
```

Notes:
You can actually combine the elements in the wrapper previous to using the `find()` method with the current elements by using `andSelf()`—e.g. `$('p').find('strong').andSelf()`.

The concept to take away is that `filter()` will only reduce (or filter) the currently selected elements in the wrapper set while `find()` can actually create an entirely new set of wrapped elements.

Notes:
Both `find()` and `filter()`are destructive methods that can be undone by using `end()`, which will revert the wrapped set back to its previous state before `find()` or `filter()` were used.

Passing `filter()` a function instead of an expression

Before you run off and create a custom filter for selecting elements, it might make more sense to simply pass the traversing `filter()` method a function that will allow you to examine each element in the wrapper set for a particular scenario.

For example, let's say you would like to wrap all `<img>` elements in an HTML page with a `<p>` element that is currently not wrapped with this element.

You could create a custom filter to accomplish this task, or you could use the `filter()` method by passing it a function that will determine if the element's parent is a `<p>` element, and if not, then remove the element from the set before you wrap the `<img>` elements remaining in the set with a `<p>` element.

In the following example, I select every `<img>` element in the HTML page, and then I pass the `filter()` method a function that is used to iterate over each element (using `this`) in the wrapper set, checking to see if the `<img>` elements' parent element is a `<p>` element.

Sample: sample38.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <img />
    <img />
    <p>
        <img />
    </p>
    <img />
    <p>
        <img />
    </p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('img').attr('src',
'http://static.jquery.com/files/rocker/images/logo_jquery_215x53.gif').filter(function ()
{ return !$(this).parent('p').length == 1 }).wrap('<p></p>');
  })(jQuery); </script>
</body>
</html>
```

Notice that I am using the `!` operator to change a Boolean value of true to false. This is because I want to remove `<img>` elements from the set that have `<p>` elements as their parent element. The function passed to the `filter()` method will only remove elements from the set if the function returns false.

The main point is that if you are dealing with an isolated situation, creating a custom filter—e.g. `:findImgWithNoP`—for a single situation can be avoided by simply passing the filter method a function that can do custom filtering. This concept is quite powerful. Consider what is possible when we use a regular expressions test in conjunction with the `filter()` method.

Sample: sample39.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul>
        <li>jQuery is great.</li>
        <li>It's lightweight.</li>
        <li>Its free!</li>
        <li>jQuery makes everything simple.</li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
```

```
    <script>  (function($){
      // Wrap a <strong> element around any text within
      // a <li> that contains the pattern "jQuery".
      var pattern = /jQuery/i;
      $('ul li').filter(function () { return pattern.test($(this).text());
}).wrap('<strong></strong>');
  })(jQuery); </script>
</body>
</html>
```

Traversing up the DOM

You can easily traverse up the DOM to ancestor elements using the **`parent()`**, **`parents()`**, and **`closest()`** methods. Understanding the differences between these methods is critical. Examine the code below and make sure you understand the differences between these jQuery traversing methods.

Sample: sample40.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="parent2">
        <div id="parent1">
            <div id="parent0">
                <div id="start"></div>
            </div>
        </div>
    </div>

    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "parent0" x4
      alert($('#start').parent().attr('id'));
      alert($('#start').parents('#parent0').attr('id'));
      alert($('#start').parents()[0].id);
      // Gets actual DOM element
      alert($('#start').closest('#parent0').attr('id'));
      // Alerts "parent1" x4
      alert($('#start').parent().parent().attr('id'));
      alert($('#start').parents('#parent1').attr('id'));
      alert($('#start').parents()[1].id);
      // Gets actual DOM element.
      alert($('#start').closest('#parent1').attr('id'));
      // Alerts "parent2" x4
      alert($('#start').parent().parent().parent().attr('id'));
      alert($('#start').parents('#parent2').attr('id'));
```

```
      alert($('#start').parents()[2].id);
      // Gets actual DOM element.
      alert($('#start').closest('#parent2').attr('id'));
  })(jQuery); </script>
</body>
</html>
```

Notes:
`closest()` and `parents()` might appear to have the same functionality, but `closest()` will actually include the currently selected element in its filtering.
`closest()` stops traversing once it finds a match, whereas `parents()` gets all parents and then filters on your optional selector. Therefore, `closest()` can only return a maximum of one element.

Traversing methods accept CSS expressions as optional arguments

CSS expressions are not only passed to the jQuery function for selecting elements, but they can also be passed to several of the traversing methods. It might be easy to forget this because many of the traversing methods function without having to use any expression at all—e.g. `next()`. The expression is optional for the following traversal methods, but remember that you have the option of providing an expression for filtering.

- children('expression')
- next('expression')
- nextAll('expression')
- parent('expression')
- parents('expression')
- prev('expression')
- prevAll('expression')
- siblings('expression')
- closest('expression')

Chapter 4 Manipulation

Creating, operating, and adding HTML on the fly

You can create HTML markup on the fly by passing the jQuery function a string of raw HTML.

Sample: sample41.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      alert($('<div><a></a></div>').get(0).nodeName); // Alerts "DIV".
      alert($('<div><a></a></div>').length); // Alerts "1" <div> is in the wrapper set.
      alert($('<div><a></a></div><div><a></a></div>').length); // Alerts "2" <div> are in
the set.
  })(jQuery); </script>
</body>
</html>
```

It is important to note that when creating DOM structures using the jQuery function, only root elements in the structure are added to the wrapper set. In the previous code example, the ** ** elements will be the only elements in the wrapper set.

We can use the **find()** method to operate on any element in the HTML structure once it is created.

Sample: sample42.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>
        (function ($) {
            $('<div><a></a></div>')
                 .find('a')
                .text('jQuery')
                .attr('href', 'http://www.jquery.com');
```

```
        })(jQuery); </script>
</body>
</html>
```

After operating on the newly created HTML, it is also possible to add it into the DOM using one of jQuery's manipulation methods. Below we use the **`appendTo()`** method to add the markup to the page.

Sample: sample43.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){  $('<div><a></a></div>')
      .find('a')
      .text('jQuery')
      .attr('href', 'http://www.jquery.com')
      .end().appendTo('body'); // end() is used to exit the find() method
  })(jQuery); </script>
</body>
</html>
```

Notes:
Simple elements that do not contain attributes—e.g. **`$('<div></div>')`**—are created via the document.createElement DOM method, while all other cases rely on the innerHTML property. In fact, you can directly pass the jQuery function an element created with document.createElement—e.g. **`$(document.createElement('div'))`**.
The HTML string passed to jQuery cannot contain elements that might be considered invalid inside of a element.
The HTML string passed to the jQuery function must be well formed.
You should open and close all HTML elements when passing jQuery HTML. Not doing so could result in bugs, mostly in Internet Explorer. Just to be safe, always close your HTML elements and avoid writing shortcut HTML—e.g. **`$(<div />)`**.

Grokking the `index()` method

You can determine the index of an element in the wrapper set by passing that element to the **`index()`** method. As an example, suppose you have a wrapper set containing all the **`<div>`** elements in a Web page, and you would like to know the index of the last **`<div>`** element.

Sample: sample44.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>0</div>
    <div>1</div>
    <div>2</div>
    <div>3</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "3"
      alert($('div').index($('div:last')));
  })(jQuery); </script>
</body>
</html>
```

The use of **index()** does not really hit home until we consider how it can be used with events. As an example, by clicking the ** ** elements in the code below, we can pass the clicked ** ** element (using the keyword **this**) to the **index()** method to determine the clicked ** **'s index.

Sample: sample45.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="nav">
        <div>nav text</div>
        <div>nav text</div>
        <div>nav text</div>
        <div>nav text</div>
        </div>
            <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
            <script>  (function ($) {
      // Alert index of the clicked div amongst all div's in the wrapper set.
      $('#nav div').click(function () {
          alert($('#nav div').index(this));
          // or, a nice trick...
          alert($(this).prevAll().length);
      });
  })(jQuery); </script>
</body>
</html>
```

Grokking the `text()` method

One might incorrectly assume that the `text()` method only returns the text node of the first element in a wrapper set. However, it will actually join the text nodes of all elements contained in a wrapper set and then return the concatenated value as a single string. Make sure you are aware of this functionality, or you might get some unexpected results.

Sample: sample46.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>1,</div>
    <div>2,</div>
    <div>3,</div>
    <div>4</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     alert($('div').text()); // Alerts "1,2,3,4"
 })(jQuery); </script>
</body>
</html>
```

Update or remove characters using a regular expression

Using the JavaScript `replace()` method combined with some jQuery functionality, we can very easily update or remove any pattern of characters from the text contained within an element.

Sample: sample47.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p>
        I really hate using JavaScript.     I mean really hate it!     It is the best
twister
        ever!
    </p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
var $p = $('p');
      // Replace 'hate' with 'love'.
      $p.text($p.text().replace(/hate/ig, 'love'));
      // Remove 'twister' and replace it with nothing.
      $p.text($p.text().replace(/twister/ig, ''));   // Keep in mind that text() returns
a string, not the jQuery object.
```

```
      // That is how the replace() string method is chained after using text()
  })(jQuery); </script>
</body>
</html>
```

You could also update any characters that are contained in a string returned from **`html()`**. This means you can not only update text, but also update and replace DOM elements via a regular expression.

Grokking the `.contents()` method

The **`.contents()`** method can be used to find all the child element nodes, including text nodes contained inside of an element. However, there is a catch. If the retrieved contents contain only text nodes, the selection will be placed inside the wrapper set as a single text node. However, if the contents you are retrieving have one or more element nodes amongst the text nodes, then the **`.contents()`** method will contain text nodes and element nodes. Examine the code below to grasp this concept.

Sample: sample48.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p>I love using jQuery!</p>
    <p>I love <strong>really</strong> using jQuery!</p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "I love using jQuery!" because no HTML elements exist.
      alert($('p:first').contents().get(0).nodeValue);
      // Alerts "I love".
      alert($('p:last').contents().get(0).nodeValue);
      // Alerts "really" but is an HTML element, not a text node.
      alert($('p:last').contents().eq(1).text());
      // Alerts "using jQuery!"
      alert($('p:last').contents().get(2).nodeValue);
  })(jQuery); </script>
</body>
</html>
```

Notice that when an item in the wrapper set is a text node, we have to extract the value by using **`.get(0).nodeValue`**. The **`contents()`** method is handy for extracting text node values. It is possible to extract only the text nodes from a DOM structure using **`contents()`**.

Sample: sample49.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <p>jQuery gives me <strong>more <span>power</span></strong> than any other web tool!
    </p>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){  $('p')     .find('*') // Select all nodes.
      .andSelf() // Include <p>.
      .contents() // Grab all child nodes, including text.
      .filter(function() {return this.nodeType == Node.TEXT_NODE;}) // Remove non-text
nodes.
      .each(function (i, text) { alert(text.nodeValue) }); // Alert text contained in
wrapper set.
  })(jQuery); </script>
</body>
</html>
```

Using `remove()` does not remove elements from wrapper set

When you use **`remove()`**, a DOM snippet from the DOM the elements contained in the removed DOM structure are still contained within the wrapper set. You could remove an element, operate on that element, and then actually place that element back into the DOM, all within a single jQuery chain.

Sample: sample50.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>remove me</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('div')
            .remove().html('<a href="http://www.jQuery.com">jQuery</a>')
          .appendTo('body');
  })(jQuery); </script>
</body>
</html>
```

The point here is that just because you **`remove()`** elements does not mean they are removed from the jQuery wrapper set.

Disable/enable form elements

Using jQuery, you can easily disable form elements by setting the disabled attribute value of a form element to disabled. To do this, we simply select an input, and then using the **attr()** method, we set the disabled attribute of the input to a value of disabled.

Sample: sample51.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input name="button" type="button" id="button" value="Click me"/>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('#button')
            .attr('disabled', 'disabled');
  })(jQuery); </script>
</body>
</html>
```

To enable a disabled form element, we simply remove the disabled attribute using **removeAttr()** or set the disabled attribute value to be empty using **attr()**.

Sample: sample52.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input name="button" type="button" id="button" value='Click me' disabled="disabled"
/>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){  $('#button').removeAttr('disabled');
            // or
      // $('#button').attr('disabled', '');
  })(jQuery); </script>
</body>
</html>
```

How to determine if a form element is disabled or enabled

Using the jQuery form filter expressions **`:disabled`** or **`:enabled`**, it is rather easy to select and determine (Boolean value) if a form element is disabled or enabled. Examine the code below for clarification.

Sample: sample53.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input name="button" type="button" id="button1" />
    <input name="button" type="button" id="button2" disabled="disabled" />
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Is it enabled?
      alert($('#button1').is(':enabled')); // Alerts true.
      // Or, using a filter.
      alert($('#button1:enabled').length); // Alerts "1".
      // Is it disabled?
      alert($('#button2').is(':disabled')); // Alerts "true".
      // Or, using a filter.
      alert($('#button2:disabled').length); // Alerts "1".
  })(jQuery); </script>
</body>
</html>
```

Selecting/clearing a single check box or radio button

You can select a radio button input or check box by setting its **`checked`** attribute to **`true`** using the **`attr()`**.

Sample: sample54.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input name="" value="" type="checkbox" />
    <input name="" value="" type="radio" />
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Set all check boxes or radio buttons to selected.
      $('input:checkbox,input:radio').attr('checked', 'checked');
  })(jQuery); </script>
</body>
</html>
```

To clear a radio button input or check box, simply remove the checked attribute using the **removeAttr()** method or set the **checked** attribute value to an empty string.

Sample: sample55.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input name="" type="checkbox" value="Test1" checked="checked">
    <input name="" type="radio" value="Test2" checked="checked">
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){  $('input').removeAttr('checked');
  })(jQuery); </script>
</body>
</html>
```

Selecting/clearing multiple check boxes or radio button inputs

You can use jQuery's **val()** on multiple check-box inputs or radio-button inputs to set the inputs to checked. This is done by passing the **val()** method an array containing a string that coincides with the check box input or radio button input value attribute.

Sample: sample56.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input type="radio" value="radio1">
    <input type="radio" value="radio2">
    <input type="checkbox" value="checkbox1">
    <input type="checkbox" value="checkbox2">
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Check all radio and check-box inputs on the page.
      $('input:radio,input:checkbox').val(['radio1', 'radio2', 'checkbox1',
'checkbox2']);
      // Use explicit iteration to clear.
      // $('input:radio,input:checkbox').removeAttr('checked');
      // or
      // $('input:radio,input:checkbox').attr('checked', '');
```

```
  })(jQuery); </script>
</body>
</html>
```

Notes:
If the check box or radio button is already selected, using `val()` will not clear the input element.

Determining if a check box or radio button is selected or cleared

We can determine if a check box input or radio button input is selected or cleared by using the `:checked` form filter. Examine the code below for several usages of the `:checked` filter.

Sample: sample57.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input checked="checked" type="checkbox" />
    <input checked="checked" type="radio" />
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Alerts "true".
      alert($('input:checkbox').is(':checked'));
      // Or, added to wrapper set if checked. Alerts "1".
      alert($('input:checkbox:checked').length);
      // Alerts "true".
      alert($('input:radio').is(':checked'));
      // Or, added to wrapper set if checked. Alerts "1".
      alert($('input:radio:checked').length);
  })(jQuery); </script>
</body>
</html>
```

How to determine if a form element is hidden

You can determine if a form element is hidden using the `:hidden` form filter. Examine the code below for several usages of the `:checked` filter.

Sample: sample58.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input type="hidden" />
```

```
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Alerts "true".
      alert($('input').is(':hidden'));
      // Or, added to wrapper set if hidden. Alerts "1".
      alert($('input:hidden').length);
  })(jQuery); </script>
</body>
</html>
```

Setting/getting the value of an input element

The **val()** method can be used to set and get the attribute value of an input element (button, checkbox, hidden, image, password, radio, reset, submit, text). Below, I set the value for each input in **val()** and then alert the value using the **val()** method.

Sample: sample 59.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input type="button" />
    <input type="checkbox" />
    <input type="hidden" />
    <input type="image" />
    <input type="password" />
    <input type="radio" />
    <input type="reset" />
    <input type="submit" />
    <input type="text" />
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('input:button').val('I am a button');
      $('input:checkbox').val('I am a check box');
      $('input:hidden').val('I am a hidden input');
      $('input:image').val('I am an image');
      $('input:password').val('I am a password');
      $('input:radio').val('I am a radio');
      $('input:reset').val('I am a reset');
      $('input:submit').val('I am a submit');
      $('input:text').val('I am a text');
      // Alerts input's value attribute.
      alert($('input:button').val());
      alert($('input:checkbox').val());
      alert($('input:hidden').val());
      alert($('input:image').val());
```

```
      alert($('input:password').val());
      alert($('input:radio').val());
      alert($('input:reset').val());
      alert($('input:submit').val());
      alert($('input:text').val());
  })(jQuery); </script>
</body>
</html>
```

Setting/getting the selected option of a select element

Using the **`val()`** method, you can set the selected value of a **`<select>`** element by passing the **`val()`** method a string representing the value assigned to the **`<option>`** element.

To get the value of the **`<select>`** element, use the **`val()`** method again to determine which option is selected. The **`val()`** method in this scenario will return the selected option's attribute value.

Sample: sample60.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <select id="s" name="s">
        <option value="option1">option one</option>
        <option value="option2">option two</option>
    </select>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Set the selected option in the select element to "option two".
      $('select').val('option2');
      // Alerts "option2".
      alert($('select').val());
  })(jQuery); </script>
</body>
</html>
```

Setting/getting selected options of a multi-select element

Using the **`val()`** method, you can set the selected values of a multi-select element by passing the **`val()`** method an array containing the corresponding values.

To get the selected options in a multi-select element, we again use the `val()` method to retrieve an array of the options that are selected. The array will contain the value attributes of the selected options.

Sample: sample61.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <select size="4" multiple="multiple">
        <option value="option1">option one</option>
        <option value="option2">option two</option>
        <option value="option3">option three</option>
        <option value="option4">option four</option>
    </select>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Set the value of the selected options.
      $('select').val(['option2', 'option4']);
      // Get the selected values.
      alert($('select').val().join(', ')); // Alerts, "option2, option4".
  })(jQuery); </script>
</body>
</html>
```

Setting/getting text contained within a `<textarea>`

You can set the text node contents of a `<textarea>` element by passing the `val()` method a text string to be used as the text. To get the value of a `<textarea>` element, we again use the `val()` method to retrieve the text contained within.

Sample: sample62.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <textarea></textarea>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Set the text contained within.
      $('textarea').val('I am a textarea');
      // Alerts "I am a textarea".
      alert($('textarea').val());
```

```
  })(jQuery); </script>
</body>
</html>
```

Setting/getting the value attribute of a button element

You can set the value attribute of a button element by passing the **`val()`** method a text string. To get the value of a button element, use the **`val()`** method again to retrieve the text.

Sample: sample63.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <button>Button</button>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Set the value: <button value="I am a Button Element">.
      $('button').val('I am a Button Element')
      // Alerts "I am a Button Element".
      alert($('button').val());
  })(jQuery); </script>
</body>
</html>
```

Editing select elements

jQuery makes some of the common tasks associated with editing select elements trivial. Below are some of those tasks with coded examples.

```
// Add options to a select element at the end.
$('select').append('<option value="">option</option>');
// Add options to the start of a select element.
$('select').prepend('<option value="">option</option>');
// Replace all the options with new options.
$('select').html('<option value="">option</option><option value="">option</option>');
// Replace items at a certain index using the :eq() selecting filter to
// select the element, and then replace it with the .replaceWith() method.
$('select option:eq(1)').replaceWith('<option value="">option</option>');
// Set the select elements' selected option to index 2.
$('select option:eq(2)').attr('selected', 'selected');
// Remove the last option from a select element.
$('select option:last').remove();
// Select an option from a select element via its
// order in the wrapper set using custom filters.
$('#select option:first');
```

```
$('#select option:last');
$('#select option:eq(3)');
$('#select option:gt(5)');
$('#select option:lt(3)');
$('#select option:not(:selected)');
// Get the text of the selected option(s), this will return the text of
// all options that are selected when dealing with a muli-select element.
$('select option:selected').text();
// Get the value attribute value of an option in a select element.
$('select option:last').val(); // Getting the :last option element.
// Get the index (0 index) of the selected option.
// Note: Does not work with multi-select elements.
$('select option').index($('select option:selected'));
// Insert an option after a particular position.
$('select option:eq(1)').after('<option value="">option</option>');
// Insert an option before a particular position.
$('select option:eq(3)').before('<option value="">option</option>');
```

Selecting form elements by type

It is possible to select form elements by their type—e.g. **`$('input:checkbox')`**. jQuery provides the following form type filters for selecting form elements by their type.

- :text
- :password
- :radio
- :checkbox
- :submit
- :image
- :reset
- :file
- :button

Selecting all form elements

You can select all form elements by using the **`:input`** form filter. This filter will select more than just input elements, it will select any **`<textarea>`**, **`<select>`**, or **`<button>`** elements as well. In the coded example below, take notice of the length of the wrapper set when using the **`:input`** filter.

Sample: sample64.html

```
<!DOCTYPE html>
<html lang="en">
```

```
<body>
    <input type="button" value="Input Button" />
    <input type="checkbox" />
    <input type="file" />
    <input type="hidden" />
    <input type="image" />
    <input type="password" />
    <input type="radio" />
    <input type="reset" />
    <input type="submit" />
    <input type="text" />
    <select>
        <option>Option</option>
    </select>
    <textarea></textarea>
    <button>Button</button>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){
      // Alerts "13" form elements
      alert($(':input').length);
  })(jQuery); </script>
</body>
</html>
```

Not limited to a single `ready()` event

It is important to keep in mind that you can declare as many custom `ready()` events as you would like. You are not limited to attaching a single `.ready()` event to the document. The `ready()` events are executed in the order that they are included.

Notes:
Passing the jQuery function, a function—e.g. `jQuery(funciton(){//code here})`—is a shortcut for `jQuery(document).ready()`.

Attaching/removing events using `bind()` and `unbind()`

Using the `bind()` method—e.g. `jQuery('a').bind('click',function(){})`—you can add any of the following standard handlers to the appropriate DOM elements.

- blur
- focus
- load
- resize
- scroll
- unload
- beforeunload
- click
- dblclick
- mousedown
- mouseup
- mousemove
- mouseover
- mouseout
- change
- select
- submit
- keydown
- keypress
- keyup
- error

Obviously, based on DOM standards, only certain handlers coincide with particular elements.

In addition to this list of standard handlers, you can also leverage **bind()** to attach jQuery custom handlers—e.g. **mouseenter** and **mouseleave**—as well as any custom handlers you may create.

To remove standard handlers or custom handlers, we simply pass the **unbind()** method the handler name or custom handler name that needs to be removed—e.g. **jQuery('a').unbind('click')**. If no parameters are passed to **unbind()**, it will remove all handlers attached to an element.

These concepts just discussed are expressed in the code example below.

Sample: sample65.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <input type="text" value="click me" />
    <br />
    <br />
    <button>remove events</button>
    <div id="log" name="log"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Bind events
      $('input').bind('click', function () { alert('You clicked me!'); });
      $('input').bind('focus', function () {
          // alert and focus events are a recipe for an endless list of dialogs
          // we will log instead
          $('#log').html('You focused this input!');
      });
      // Unbind events
      $('button').click(function () {
          // Using shortcut binding via click()
          $('input').unbind('click');
          $('input').unbind('focus');
          // Or, unbind all events     // $('button').unbind();
      });
  })(jQuery); </script>
</body>
</html>
```

Notes:
jQuery provides several shortcuts to the **bind()** method for use with all standard DOM events, which excludes custom jQuery events like **mouseenter** and **mouseleave**. Using these shortcuts simply involves substituting the event's name as the method name—e.g. **.click()**, **mouseout()**, **focus()**.

You can attach unlimited handlers to a single DOM element using jQuery.
jQuery provides the `one()` event handling method to conveniently bind an event to DOM elements that will be executed once and then removed. The `one()` method is just a wrapper for `bind()` and `unbind()`.

Programmatically invoke a specific handler via short event methods

The shortcut syntax—e.g. `.click()`, `mouseout()`, and `focus()`—for binding an event handler to a DOM element can also be used to invoke handlers programmatically. To do this, simply use the shortcut event method without passing it a function. In theory, this means that we can bind a handler to a DOM element and then immediately invoke that handler. Below, I demonstrate this via the `click()` event.

Sample: sample66.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a>Say Hi</a>
    <!--clicking this element will alert "hi" -->
    <a>Say Hi</a>
    <!--clicking this element will alert "hi" -->
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Bind a click handler to all <a> and immediately invoke their handlers.
      $('a').click(function () { alert('hi') }).click();
      // Page will alert twice. On page load, a click
      // is triggered for each <a> in the wrapper set.
  })(jQuery); </script>
</body>
</html>
```

Notes:
It is also possible to use the event `trigger()` method to invoke specific handlers—e.g. `jQuery('a').click(function(){ alert('hi') }).trigger('click')`. This will also work with namespaced and custom events.

jQuery normalizes the event object

jQuery normalizes the event object according to W3C standards. This means that when the event object is passed to a function handler, you do not have to worry about browser-specific implementations of the event object (e.g. Internet Explorer's `window.event`). You can use the following attributes and methods of the event object worry-free from browser differences because jQuery normalizes the event object.

Event object attributes

- event.type
- event.target
- event.data
- event.relatedTarget
- event.currentTarget
- event.pageX
- event.pageY
- event.result
- event.timeStamp

Event object methods

- event.preventDefault()
- event.isDefaultPrevented()
- event.stopPropagation()
- event.isPropagationStopped()
- event.stopImmediatePropagation()
- event.isImmediatePropagationStopped()

To access the normalized jQuery event object, simply pass the anonymous function, passed to a jQuery event method, a parameter named "event" (or whatever you want to call it). Then, inside of the anonymous callback function, use the parameter to access the event object. Below is a coded example of this concept.

Sample: sample67.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $(window).load(function (event) { alert(event.type); }); // Alerts "load".
  })(jQuery); </script>
</body>
</html>
```

Grokking event namespacing

Often we will have an object in the DOM that needs to have several functions tied to a single event handler. For example, let's take the resize handler. Using jQuery, we can add as many functions to the **`window.resize`** handler as we like. But what happens when we need to remove only one of these functions but not all of them? If we use **`$(window).unbind('resize')`**, all functions attached to the **`window.resize`** handler will be removed. By namespacing a handler (e.g. **`resize.unique`**), we can assign a unique hook to a specific function for removal.

Sample: sample68.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $(window).bind('resize', function ()
      { alert('I have no namespace'); });

      $(window).bind('resize.unique', function () { alert('I have a unique namespace');
});

      // Removes only the resize.unique function from event handler
      $(window).unbind('resize.unique')
  })(jQuery); </script>
</body>
</html>
```

In the above code, we add two functions to the resize handler. The second (document order) resize event added uses event namespacing and then immediately removes this event using **`unbind()`**. I did this to make the point that the first function attached is not removed. Namespacing events gives us the ability to label and remove unique functions assigned to the same handler on a single DOM element.

In addition to unbinding a specific function associated with a single DOM element and handler, we can also use event namespacing to exclusively invoke (using **`trigger()`**) a specific handler and function attached to a DOM element. In the code below, two click events are being added to **`<a>`**, and then using namespacing, only one is invoked.

Sample: sample69.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a>click</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('a').bind('click',
       function () { alert('You clicked me') });
      $('a').bind('click.unique',
          function () { alert('You Trigger click.unique') });  // Invoke the function
passed to click.unique
      $('a').trigger('click.unique');
  })(jQuery); </script>
```

```
</body>
</html>
```

Notes:
There is no limit to the depth or number of namespaces used—
e.g. `resize.layout.headerFooterContent`.
Namespacing is a great way of protecting, invoking, removing any exclusive handlers that a plugin may require.
Namespacing works with custom events as well as standard events—e.g. `click.unique` or `myclick.unique`.

Grokking event delegation

Event delegation relies on event propagation (a.k.a. bubbling). When you click an `<a>` inside of a `<li>`, which is inside of a `<ul>`, the click event bubbles up the DOM from the `<a>` to the `<li>` to the `<ul>` and so on, until each ancestor element with a function assigned to an event handler fires.

This means if we attach a click event to a `<ul>` and then click an `<a>` that is encapsulated inside of the `<ul>`, eventually the click handler attached to the `<ul>`, because of bubbling, will be invoked. When it is invoked, we can use the event object (`event.target`) to identify which element in the DOM actually caused the event bubbling to begin. Again, this will give us a reference to the element that started the bubbling.

By doing this, we can seemly add an event handler to a great deal of DOM elements using only a single event handler/declaration. This is extremely useful; for example, a table with 500 rows where each row requires a click event can take advantage of event delegation. Examine the code below for clarification.

Sample: sample70.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <ul>
        <li><a href="#">remove</a></li>
        <li><a href="#">remove</a></li>
        <li><a href="#">remove</a></li>
        <li><a href="#">remove</a></li>
        <li><a href="#">remove</a></li>
        <li><a href="#">remove</a></li>
    </ul>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
```

```
      $('ul').click(function (event) { // Attach click handler to <ul> and pass event
object.
          // event.target is the <a>.
          $(event.target).parent().remove(); // Remove <li> using parent()
          return false; // Cancel default browser behavior, stop propagation.
      });
  })(jQuery); </script>
</body>
</html>
```

Now, if you were to literally click on one of the actual bullets of the list and not the link itself, guess what? You'll end up removing the **<ul>**. Why? Because all clicks bubble. So when you click on the bullet, the **event.target** is the **<li>**, not the **<a>**. Since this is the case, the **parent()** method will grab the **<ul>** and remove it. We could update our code so that we only remove an **<li>** when it is being clicked from an **<a>** by passing the **parent()** method an element expression.

$(event.target).parent('li').remove();

The important point here is that you have to manage carefully what is being clicked when the clickable area contains multiple encapsulated elements due to the fact that you never know exactly where the user may click. Because of this, you have to check to make sure the click occurred from the element you expected it to.

Applying event handlers to DOM elements regardless of DOM updates using live()

Using the handy **live()** event method, you can bind handlers to DOM elements currently in a Web page and those that have yet to be added. The **live()** method uses event delegation to make sure that newly added/created DOM elements will always respond to event handlers regardless of DOM manipulations or dynamic changes to the DOM. Using **live()** is essentially a shortcut for manually having to set up event delegation. For example, using **live()** we could create a button that creates another button indefinitely.

Sample: sample71.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <button>Add another button</button>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('button').live('click', function ()
```

```
      { $(this).after("<button>Add another button</button>"); });
  })(jQuery); </script>
</body>
</html>
```

After examining the code, it should be obvious that we are using **live()** to apply event delegation to a parent element (**<body>** element in the code example) so that any button element added to the DOM always responds to the click handler.

To remove the live event, we simply use the **die()** method—e.g. **$('button').die()**.

The concept to take away is the **live()** method could be used to attach events to DOM elements that are removed and added using AJAX. In this way, you would forgo having to rebind events to new elements introduced into the DOM after the initial page load.

Notes:
live() supports the following handlers: **click**, **dblclick**, **mousedown**, **mouseup**, **mousemove**, **mouseover**, **mouseout**, **keydown**, **keypress**, **keyup**.
live() only works against a selector.
live() by default will stop propagation by using **return false** within the function sent to the **live()** method.

Adding a function to several event handlers

It is possible to pass the event **bind()** method several event handlers. This makes it possible to attach the same function, written once, to many handlers. In the code example below, we attach a single anonymous callback function to the click, keypress, and resize event handlers on the document.

Sample: sample72.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Responds to multiple events.
      $(document).bind('click keypress resize', function (event) { alert('A click,
keypress, or resize event occurred on the document.'); });
  })(jQuery); </script>
</body>
</html>
```

Cancel default browser behavior with `preventDefault()`

When a link is clicked or a form is submitted, the browser will invoke its default functionality associated with these events. For example, click an `<a>` link and the Web browser will attempt to load the value of the `<a> href` attribute in the current browser window. To stop the browser from performing this type of functionality, you can use the `preventDefault()` method of the jQuery normalized event object.

Sample: sample73.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a href="http://www.jquery.com">jQuery</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Stops browser from navigating.
      $('a').click(function (event) { event.preventDefault(); });
  })(jQuery); </script>
</body>
</html>
```

Cancel event propagation with `stopPropagation()`

Events propagate (a.k.a. bubble) up the DOM. When an event handler is fired for any given element, the invoked event handler is also invoked for all ancestor elements. This default behavior facilitates solutions like event delegation. To prohibit this default bubbling, you can use the jQuery normalized event method `stopPropagation()`.

Sample: sample74.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div><span>stop</span></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('div').click(function (event) {
          // Attach click handler to <div>.
          alert('You clicked the outer div');
      });

      $('span').click(function (event) {
          // Attach click handler to <span>.
          alert('You clicked a span inside of a div element');
```

```
            // Stop click on <span> from propagating to <div>.
            // If you comment out the line below,
            //the click event attached to the div will also be invoked.
            event.stopPropagation();
        });
  })(jQuery); </script>
</body>
</html>
```

In the code example above, the event handler attached to the ** ** element will not be triggered.

Cancelling default behavior and event propagation via `return false`

Returning false—e.g. **`return false`**—is the equivalent of using both **`preventDefault()`** and **`stopPropagation()`**.

Sample: sample75.html

```
<!DOCTYPE html>
<html lang="en">
<body><span><a href="javascript:alert('You clicked me!')" class="link">click
me</a></span>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){     $('span').click(function(){
      // Add click event to <span>.
      window.location='http://www.jquery.com';     });
      $('a').click(function(){
          // Ignore clicks on <a>.
          return false;
      });
  })(jQuery); </script>
</body>
</html>
```

If you were to comment out the **`return false`** statement in the code above, **`alert()`** would get invoked because by default the browser will execute the value of the **`href`**. Also, the page would navigate to jQuery.com due to event bubbling.

Create custom events and trigger them via `trigger()`

With jQuery, you have the ability to manufacture your own custom events using the **`bind()`** method. This is done by providing the **`bind()`** method with a unique name for a custom event.

Now, because these events are custom and not known to the browser, the only way to invoke custom events is to programmatically trigger them using the jQuery **`trigger()`** method. Examine the code below for an example of a custom event that is invoked using **`trigger()`**.

Sample: sample76.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>jQuery</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$('div').bind('myCustomEvent', function () {
      // Bind a custom event to <div>.
      window.location = 'http://www.jquery.com';
  });
      $('div').click(function () {
          // Click the <div> to invoke the custom event.
          $(this).trigger('myCustomEvent');
      })
  })(jQuery); </script>
</body>
</html>
```

Cloning events as well as DOM elements

By default, cloning DOM structures using the **`clone()`** method does not additionally clone the events attached to the DOM elements being cloned. In order to clone the elements and the events attached to the elements you must pass the **`clone()`** method a Boolean value of **`true`**.

Sample: sample77.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <button>Add another button</button>
    <a href="#" class="clone">Add another link</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$('button').click(function () {
```

```
var $this = $(this);
      $this.clone(true).insertAfter(this);
      // Clone element and its events.
      $this.text('button').unbind('click'); // Change text, remove event.
  });
      $('.clone').click(function () {
          var $this = $(this);
          $this.clone().insertAfter(this); // Clone element, but not its events.
          $this.text('link').unbind('click'); // Change text, remove event.
      });
  })(jQuery); </script>
</body>
</html>
```

Getting X and Y coordinates of the mouse in the viewport

By attaching a **mousemove** event to the entire page (document), you can retrieve the X and Y coordinates of the mouse pointer as it moves around inside in the viewport over the canvas. This is done by retrieving the **pageY** and **pageX** properties of the jQuery normalized event object.

Sample: sample78.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$(document).mousemove(function (e) {
      // e.pageX - gives you the X position.
      // e.pageY - gives you the Y position.
      $('body').html('e.pageX = ' + e.pageX + ', e.pageY = ' + e.pageY);
  });
  })(jQuery); </script>
</body>
</html>
```

Getting X and Y coordinates of the mouse relative to another element

It is often necessary to get the X and Y coordinates of the mouse pointer relative to an element other than the viewport or entire document. This is usually done with ToolTips, where the ToolTip is shown relative to the location that the mouse is hovering. This can easily be accomplished by subtracting the offset of the relative element from the viewport's X and Y mouse coordinates.

Sample: sample79.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <!-- Move mouse over div to get position relative to the div -->
    <div style="margin: 200px; height: 100px; width: 100px; background: #ccc; padding:
20px">
        relative to this </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){  $('div').mousemove(function(e){
      //relative to this div element instead of document.
      var relativeX = e.pageX - this.offsetLeft;
      var relativeY = e.pageY - this.offsetTop;
      $(this).html('releativeX = ' + relativeX + ', releativeY = ' + relativeY);
  });
  })(jQuery); </script>
</body>
</html>
```

Disabling the right-click contextual menu

Using JavaScript, you can disable the browser's native right-click contextual menu. Doing so with jQuery is a snap. We simply cancel the **`contenxtmenu`** event.

Sample: sample80.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) { $(document).bind('contextmenu', function () { return false;
}); })(jQuery); </script>
</body>
</html>
```

Scrolling the browser window

While there are numerous plugins for scrolling the browser window, doing so can be trivial when a simple scroll is required. By setting the **`scrollTop`** CSS property on the **`<html>`** and **`<body>`** elements, it is possible to control the position of the horizontal or vertical scrolling. In the code below, I use the **`animate()`** method to animate the horizontal scrolling to a specific element in the page.

Sample: sample81.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <style>
        li
        {
            padding-bottom: 500px;
        }
    </style>
    <ul>
        <li><a href="#" class="next">Next</a></li>
        <li><a href="#" class="next">Next</a>/<a href="#" class="prev">Previous</a></li>
        <li><a href="#" class="next">Next</a>/<a href="#" class="prev">Previous</a></li>
        <li><a href="#" class="prev">Previous</a></li>
    </ul>
```

```
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('.next')
            .click(function () { $('html, body').animate({ scrollTop:
$(this).parent().next().find('a').offset().top }, 1000); });
      $('.prev')
          .click(function () { $('html, body').animate({ scrollTop:
$(this).parent().prev().find('a').offset().top }, 1000); });
  })(jQuery); </script>
</body>
</html>
```

Chapter 8 Plugins

Use the $ alias when constructing a plugin

When writing a jQuery plugin, the same conflict prevention routine used with regular, old jQuery code should be implemented. With this in mind, all plugins should be contained inside a private scope where the $ alias can be used without fear of conflicts or surprising results.

The coding structure below should look familiar as it is used in almost every code example in this book and explained in Chapter 1.

Sample: sample82.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  alert(jQuery(document).jquery);
        // Don't use $ here. It is not reliable.
        (function ($) {
            // Can use $ without fear of conflicts.
            alert($(document).jquery);
        })(jQuery);  </script>
</body>
</html>
```

New plugins attach to jQuery.fn object to become jQuery methods

New plugins are attached to the jQuery.fn object, as this is a shortcut or alias for jQuery.prototype. In our coding example below, we are adding the count plugin to the jQuery.fn object. By doing this, we are creating our own custom jQuery method that can be used on a wrapped set of DOM elements.

Basically, a plugin attached to jQuery.fn allows us to create our own custom methods similar to any found in the API. This is because when we attach our plugin function to jQuery.fn, our function is included in the prototype chain—$.fn.count = function(){}—for jQuery objects created using the jQuery function. If that blows your mind, just remember that adding a function to jQuery.fn means that the keyword this inside of the plugin function will refer to the jQuery object itself.

Sample: sample83.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$.fn.count = function () {
      var $this = $(this); // "this" is the jQuery object.
      $this.text('0'); // Sets the counter start number to zero.
      var myInterval = window.setInterval(function () {
          // Interval for counting.
          var currentCount = parseFloat($this.text()); var newCount = currentCount + 1;
$this.text(newCount + '');
      }, 1000);
  };
  })(jQuery); jQuery('#counter1').count();  </script>
</body>
</html>
```

Notes:
By adding a plugin to the **jQuery.fn** object, we are essentially saying that our plugin would like to use the jQuery function to select a context (DOM elements). If your plugin does not require a specific context (in other words a set of DOM elements) in which it needs to operate, you might not need to attach this plugin to the **$.fn**. It might make more sense to add it as a utility function in the jQuery namespace.

Inside a plugin, `this` is a reference to the current jQuery object

When you attach a plugin to the **jQuery.fn** object, the keyword **this** used inside of the attached plugin function will refer to the current jQuery object.

Sample: sample84.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$.fn.count = function () {
      // "this" is equal to jQuery('#counter1').
      alert(this); // Alerts jQuery object.
      alert(this[0]); // Alerts div element.
```

```
      alert(this[0].id); // Alerts "counter1".
  };

  })(jQuery); jQuery('#counter1').count();  </script>
</body>
</html>
```

It is critical that you grok exactly what the keyword **this** is referring to in the plugin function.

Using each() to iterate over the jQuery object and provide a reference to each element in the object using the this keyword

Using **each()**, we can create an implicit iteration for our plugin. This means that if the wrapper set contains more than one element, our plugin method will be applied to each element in the wrapper set.

To do this, we use the jQuery utility **each()** function, which is a generic iterator for both objects and arrays, basically simplifying looping. In the code example below, we use the function to iterate over the jQuery object itself. Inside of the function that is passed to **each()**, the keyword **this** will refer to the elements in the jQuery wrapper set.

Sample: sample85.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <div id="counter2"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
       $.fn.count = function () {
           this.each(function () {
               // "this" is the current jQuery object.
               var $this = $(this);
               $this.text('0'); // Sets the counter start number.
               var myInterval = window.setInterval(function () {
                   // Interval for counting.
                   var currentCount = parseFloat($this.text()); var newCount =
currentCount + 1; $this.text(newCount + '');
               }, 1000);
           });
       };
```

```
 })(jQuery); jQuery('#counter1, #counter2').count();  </script>
</body>
</html>
```

Using the **each()** function is critical if you would like a plugin to employ implicit iteration.

Plugin returning jQuery object so jQuery methods or other plugins can be chained after using plugin

Typically, most plugins return the jQuery object itself so that the plugin does not break the chain. In other words, if a plugin does not specifically need to return a value, it should continue the chain so that additional methods can be applied to the wrapper set. In the code below, we are returning the jQuery object with the **return this;** statement so that chaining will not be broken. Notice that I am chaining on the **parent()** and **append()** methods after I call the **count()** plugin.

Sample: sample86.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <div id="counter2"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
$.fn.count = function () {
       return this.each(function () {
           // Return the jQuery object, or "this" after each()
           var $this = $(this);
           $this.text('0');
           var myInterval = window.setInterval(function () { var currentCount =
parseFloat($this.text()); var newCount = currentCount + 1; $this.text(newCount + ''); },
1000);
       });
   };
   })(jQuery); jQuery('#counter1, #counter2').count().parent() // Chaining continues
because jQuery object is returned.
       .append('<p>Chaining still works!</p>');   </script>
</body>
</html>
```

Notes:
It is possible to make the plugin a destructive method by simply not returning the jQuery object.

Default plugin options

Plugins typically contain default options that will act as the baseline default configuration for the plugins' logic. These options are used when the plugin is invoked. In the code below, I am creating a **defaultOptions** object containing a single property (**startCount**) and value (**0**). This object is stored on the count function **$.fn.count.defaultOptions**. We do this so the options are configurable from outside the plugin.

Sample: sample87.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <div id="counter2"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
$.fn.count = function () {
       return this.each(function () {
           var $this = $(this);             // Sets the counter start number to zero.
           $this.text($.fn.count.defaultOptions.startCount + '');
           var myInterval = window.setInterval(function () { var currentCount =
parseFloat($this.text()); var newCount = currentCount + 1; $this.text(newCount + ''); },
1000);
       });
   }; $.fn.count.defaultOptions = { startCount: 100 };
   })(jQuery); jQuery('#counter1, #counter2').count();    </script>
</body>
</html>
```

Custom plugin options

Typically, the default plugin options can be overwritten with custom options. In the code below, I pass in a **customOptions** object as a parameter to the plugin function. This object is combined with the **defaultOptions** object to create a single **options** object. We use the jQuery utility method **extend()** to combine multiple objects into a single object. The **extend()** method provides the perfect utility for overwriting an object with new properties. With this code in place, the plugin can now be customized when invoked. In the example, we pass the **count** plugin a custom number (500) to be used as the starting point for the count. This custom option overrides the default option (0).

Sample: sample88.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <div id="counter2"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
       $.fn.count = function (customOptions) {
           // Create new option, extend object with defaultOptoins and customOptions.
           var options = $.extend({}, $.fn.count.defaultOptions, customOptions);
           return this.each(function () {
               var $this = $(this); // Sets the counter start number to the default
               option value
               // or to a custom option value if it is passed to the plugin.
               $this.text(options.startCount + '');
               var myInterval = window.setInterval(function () { var currentCount =
parseFloat($this.text()); var newCount = currentCount + 1; $this.text(newCount + ''); },
1000);
           });
       }; $.fn.count.defaultOptions = { startCount: 100 };
   })(jQuery);  // Passing a custom option overrides default.
        jQuery('#counter1, #counter2').count({ startCount: 500 });

    </script>
</body>
</html>
```

Overwriting default options without altering original plugin code

Since default options are accessible from outside a plugin, it is possible to reset the default options before invoking the plugin. This can be handy when you want to define your own options without altering the plugin code itself. Doing so can simplify plugin invocations because you can, in a sense, globally set up the plugin to your liking without forking the original plugin code itself.

Sample: sample89.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div id="counter1"></div>
    <div id="counter2"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
       $.fn.count = function (customOptions) {
```

```
            var options = $.extend({}, $.fn.count.defaultOptions, customOptions);
            return this.each(function () {
                var $this = $(this); $this.text(options.startCount + '');
                var myInterval = window.setInterval(function () { var currentCount =
parseFloat($this.text()); var newCount = currentCount + 1; $this.text(newCount + ''); },
1000);
            });
        }; $.fn.count.defaultOptions = { startCount: 100 };
    })(jQuery);  // Overwrite default options.
        jQuery.fn.count.defaultOptions.startCount = 200; jQuery('#counter1').count(); //
Will use startCount: 200, instead of startCount:0
        jQuery('#counter2').count({ startCount: 500 }); // Will overwrite any default
values.     </script>
</body>
</html>
```

Create elements on the fly, invoke plugins programmatically

Depending on the nature of the plugin, it can be critical that a plugin be called both normally (via DOM elements and events) as well as programmatically. Consider a dialog plugin. There will be times that the modal/dialog will open based on user events. Other times, a dialog will need to open based on environmental or system events. In these situations, you can still invoke your plugin without any elements in the DOM by creating an element on the fly in order to invoke the plugin. In the code below, I invoke the **`dialog()`** plugin on page load by first creating an element to invoke my plugin.

Sample: sample90.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <a href="#" title="Hi">dialog, say hi</a> <a href="#" title="Bye">dialog, say
    bye</a>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
       $.fn.dialog = function (options) { var text = this.attr('title') || this.text();
alert(text); };
   })(jQuery);
        jQuery('a').click(function () { // Invoked by user event
            $(this).dialog(); return false;
        });
        $(window).load(function () {     // Create DOM element to invoke the plugin
            jQuery("<a></a>").attr('title', 'I say hi when invoked!').dialog(); // Run
immediately.
        });  </script>
</body>
</html>
```

Obviously, there could be a lot of variation of this pattern depending on the options, complexity, and functionality of the plugin. The point here is that plugins can be called via existing DOM elements, as well as those created on the fly.

Providing callbacks and passing context

When authoring jQuery plugins, it is a good idea to provide callback functions as an option, and to pass these functions the context of **this** when the callback is invoked. This provides a vehicle for additional treatment to elements in a wrapper set. In the code below, we are passing a custom option to the **outAndInFade()** plugin method that is a function and should be called once the animation is complete. The callback function is being passed the value of **this** when it's being invoked. This allows us to then use the **this** value inside the function we defined. When the callback function is invoked, the keyword **this** will refer to one of the DOM elements contained within the wrapper set.

Sample: sample91.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div>Out And In Fade</div>
    <div>Out And In Fade</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>   (function ($) {
$.fn.outAndInFade = function (customOptions) {
       var options = $.extend({}, $.fn.outAndInFade.defaultOptions, customOptions || {});
       return this.each(function () {
           $(this).fadeOut().fadeIn('normal', function () { // Callback for fadeIn()
               // Call complete() function, pass it "this".
               if ($.isFunction(options.complete)) {
                   options.complete.apply(this);
               }
           });
       });
   };
       $.fn.outAndInFade.defaultOptions = {
           complete: null // No default function.
       };
   })(jQuery); jQuery('div').outAndInFade({
       // Change background-color of the element being animated on complete.
       // Note: "this" will refer to the DOM element in the wrapper set.
       complete: function () { $(this).css('background', '#ff9'); }
```

```
  });  </script>
</body>
</html>
```

Disable all jQuery effect methods

It is possible to disable all of the animating methods jQuery provides by simply setting the value of the **off** property to **true**.

Sample: sample92.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px;">Try to animate me! </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function($) {
     jQuery.fx.off = true;
     $('div').slideUp(); // Does not animate, hides immediately.
 })(jQuery); </script>
</body>
</html>
```

When **off** is set to **true**, all the effect methods will not animate and will instead be hidden and shown immediately using the CSS rules **display:none** and **display:block**. You can turn the animation back on by passing the **off** property a **false** value.

Sample: sample93.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px;">
        Try to animate me!
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     jQuery.fx.off = true;
     $('div').slideUp();
     jQuery.fx.off = false; // Turn animation back on.
```

```
    $('div').slideDown(); // It will now animate.
 })(jQuery); </script>
</body>
</html>
```

Grokking the `stop()` animation method

It is often necessary to stop an animation currently in progress before starting another. For example, when using the custom **`mouseenter`** and **`mouseleave`** events (or **`hover()`** method), you may unintentionally trigger an element that is already animating due to a previous **`mouseenter`** or **`mouseleave`** event. This causes a buildup of queued animations, which results in a sluggish interface. To avoid this, simply use the **`stop()`** method to stop the current animation before starting a new one.

Sample: sample94.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px;">
        Hover over Me!
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      $('div').hover(function ()
      { $(this).stop().animate({ left: 75 }, 'fast'); },
        function () { $(this).stop().animate({ left: 20 }, 'fast'); });
  })(jQuery); </script>
</body>
</html>
```

Remove the **`stop()`** methods from the code and roll the mouse over the element several times to see the ghost animations occur. Continuously rolling over the element in the page will result in animation buildup, which is typically not the desired result.

Notes:
Additionally, it is possible to not only stop the current animation in the queue for the select element but also the entire queue by passing the **`stop()`** method a parameter of true. This will effectively stop all queued animations, active and inactive.

Determining if an element is animating using `:animated`

The custom `:animated` selector filter can be used to select elements that are currently animating. Below, I use this custom selector filter to add text to an animating `<div>` element.

Sample: sample95.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; color: white"></div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      function recursiveAnimate()
      { $('div').slideToggle('slow', recursiveAnimate); };
      recursiveAnimate(); $('div:animated').text('I am animating');
  })(jQuery); </script>
</body>
</html>
```

Using `show()`, `hide()`, and `toggle()`, without animation

Using the `show()`, `hide()`, and `toggle()` methods with a parameter will cause the elements being shown or hidden to animate by changing CSS properties: height, width, opacity, margin, padding. It is possible to skip the animations for hiding and showing elements simply by not passing any parameters. This changes how these methods adjust the visibility of an element. Affected elements will simply appear or disappear without any animation by adjusting the CSS `display` property instead.

Sample: sample96.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <style type="text/css">
        div
        {
            height: 100px;
            width: 100px;
            background-color: red;
            color: white;
            margin: 5px;
        }
    </style>
</head>
<body>
```

```
    <div>Click Me (hide animation)</div>
    <div>Click Me (hide no animation)</div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
      // Hide with animation.
      $('div:first').click(function () { $(this).hide(1000) });
      // Hide no animation,
      $('div:last').click(function () { $(this).hide() });
  })(jQuery); </script>
</body>
</html>
```

Notes:
The jQuery methods **hide()**, **show()**, **toggle()**, **slideUp()**, **slideDown()**, **slideToggle()**, when used on elements that have a CSS **display** value of **inline**, will be changed to **display:block** for the duration of the animation.

Grokking sequential and nonsequential animations

It is important to understand the difference between animations that happen simultaneously, and animations that occur in a sequential order over time. By default, when effect methods are chained, they are added to a queue, and each effect occurs one after another.

Sample: sample97.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px; border: 1px solid #ff9933">
        Animate me!
    </div>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px; top: 100px; border: 1px solid #ff9933">
        Animate me!
    </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function ($) {
     // Each effect is added to a queue and occurs sequentially.
     $('div:first').slideUp('slow').slideDown('slow').hide('slow');
     // Each method is added to a queue and occurs sequentially.
     $('div:last').animate({ width: '200px' }, 1000).animate({ borderLeftWidth: '10px' },
1000);
 })(jQuery); </script>
</body>
</html>
```

Using the **animate()** method, you can set animations to occur non-sequentially or at the same time by passing all the CSS property changes to a single **animate()** method call. In the code below, the ** ** will animate its width and border left width at the same time.

Sample: sample98.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <div style="height: 100px; width: 100px; background-color: red; position: absolute;
        left: 20px; border: 1px solid #ff9933">Animate me! </div>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script> (function($){
     // Both width and borderLeftWidth properties will animate simultaneously.
     $('div').animate({ width: '200px', borderLeftWidth: '10px' }, 1000);
 })(jQuery); </script>
</body>
</html>
```

Animate() is the base, low-level abstraction

The **animate()** method is the base method that is used to construct all the pre-configured animations—e.g. **hide()**, **slideDown()**. It provides the ability to change (over time) the values of style properties.

Here is what you need to know when using this method.

- Only properties that take numeric values are supported. In other words, you can't animate the value of, say, the **backgroundColor** property (at least not without a plugin). Also, properties that take more than one value like **backgroundPosition** can't be animated.
- You can animate CSS properties by using em and % where applicable.
- Relative animations can be specified using "+=" or "-=" in front of the property value. This would, for example, move an element positively or negatively relative to its current position.
- If you specify an animation duration of 0, the animation will immediately set the elements to their end state.
- As a shortcut, if a value of **toggle** is passed, an animation will simply reverse from where it is and animate to that end.
- All CSS properties set via a single **animate()** method will animate at the same time.

Grokking the jQuery fading methods

Three concepts need to be called out when using the `fadeIn()`, `fadeOut()`, and `fadeTo()` methods.

- Unlike other effect methods, fading methods only adjust the opacity of an element. It is assumed when using these effect methods that any element being faded already has a height and width.
- Fading animations will fade elements from their current opacity.
- Using the `fadeOut()` method will fade an element from its current opacity, and then once 100% faded, it will change the CSS display property of the element to "none."

Each of the aforementioned points is illustrated in the code below.

Sample: sample99.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <!-- Elements being faded should have a width and height -->
    <div style="height: 100px; width: 100px; background-color: red;"></div>
    <button>Fade the rest of the way</button>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function ($) {
$('div').fadeTo('slow', 0.50);
      $('button').click(function () {
          // Fade from current opacity to zero,
          // and then hide element via display:none
          $('div').fadeOut('slow');
      });
  })(jQuery); </script>
</body>
</html>
```

Chapter 10 AJAX

The jQuery `ajax()` function is the lowest-level abstraction

The jQuery **`ajax()`** function is the lowest level of abstraction available for XMLHttpRequests (aka AJAX). All the other jQuery AJAX functions, such as **`load()`**, leverage the **`ajax()`** function. Using the **`ajax()`** function provides the greatest functionality available for XMLHttpRequests. jQuery also provides other higher-level abstractions for doing very specific types of XMLHttpRequests. These functions are essentially shortcuts for the **`ajax()`** method.

These shortcut methods are:

- **`load()`**
- **`get()`**
- **`getJSON()`**
- **`getScript()`**
- **`post()`**

The point to take away is that while the shortcuts are nice at times, they all use **`ajax`**() behind the scenes. And, when you want all the features and customizations that jQuery offers when it comes to AJAX, then you should just use the ajax() method.

Notes:
By default, the **`ajax()`** and **`load()`** AJAX functions both use the GET HTTP protocol.

jQuery supports cross-domain JSONP

JSON with Padding (JSONP) is a technique that allows the sender of an HTTP request, where JSON is returned, to provide a name for a function that is invoked with the JSON object as a parameter of the function. This technique does not use XHR. It uses the script element so data can be pulled into any site, from any site. The purpose is to circumvent the same-source policy limitations of XMLHttpRequest.

Using the **`getJSON()`** jQuery function, you can load JSON data from another domain when a JSONP callback function is added to the URL. As an example, here is what a URL request would look like using the Flickr API.

```
http://api.flickr.com/services/feeds/photos_public.gne?tags=resig&tagmode=all&format=json
&jsoncallback=?
```

The `?` value is used as a shortcut that tells jQuery to call the function that is passed as a parameter of the `getJSON()` function. You could replace the `?` with the name of another function if you do not want to use this shortcut.

Below, I am pulling into a Web page, using the Flickr JSONP API, the most recent photos tagged with "resig." Notice that I am using the `?` shortcut so jQuery will simply call the callback function I provided the `getJSON()` function. The parameter passed to the callback function is the JSON data requested.

Sample: sample100.html

```
<!DOCTYPE html>
<html lang="en">
<body>
    <script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"></script>
    <script>  (function($){

$.getJSON("http://api.flickr.com/services/feeds/photos_public.gne?tags=resig&tagmode=all&
format=json&jsoncallback=?",
          // Using ? just means call the callback function provided.
          function (data) { // Data is the JSON object from Flickr.
              $.each(data.items, function (i, item) { $('<img />').attr("src",
item.media.m).appendTo('body'); if (i == 30) return false; });
          });
  })(jQuery); </script>
</body>
</html>
```

Notes:
Make sure you check the API of the service you are using for the correct usage of the callback. As an example, Flickr uses the name `jsoncallback=?` whereas Yahoo! and Digg use the name `callback=?`.

Stop a browser from caching XHR requests

When doing an XHR request, Internet Explorer will cache the response. If the response contains static content with a long shelf life, caching may be a good thing. However, if the content being requested is dynamic and could change by the second, you will want to make sure that the request is not cached by the browser. One possible solution is to append a unique query string value to the end of the URL. This will ensure that for each request the browser is requesting a unique URL.

```
// Add unique query string at end of the URL.
url:'some?nocache='+(new Date()).getTime()
```

Another solution, which is more of a global solution, is to set up all AJAX requests by default to contain the no-cache logic we just discussed. To do this, use the **ajaxSetup** function to globally switch off caching.

```
$.ajaxSetup({
            cache: false // True by default. False means caching is off.
    });
```

Now, in order to overwrite this global setting with individual XHR requests, you simply change the cache option when using the **ajax()** function. Below is a coded example of doing an XHR request using the **ajax()** function, which will overwrite the global setting and cache the request.

```
$.ajaxSetup ({   cache: false // True by default. False means caching is off.
        });

jQuery.ajax({ cache: true, url: 'some', type: 'POST' } );
```