

Web Technologies: HTML5 and jQuery

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What is HTML5?

- ◆ HTML5 is the next generation of HTML
 - » HTML 4.01 was standardized in 1999
- ◆ HTML5 will be the new standard for HTML, XHTML, and the HTML DOM
 - » still under development
 - » most modern browsers have some support
- ◆ Standard document
 - » <http://www.w3.org/TR/html5/>

Lecture Resources:

<http://www.w3schools.com/html5/>

<http://html5doctor.com>

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Rules for HTML5

- ◆ New features should be based on HTML, CSS, DOM, and JavaScript
- ◆ Reduce the need for external plugins (like Flash)
- ◆ Better error handling
- ◆ More markup to replace scripting
- ◆ Device independent
- ◆ Development process should be visible to the public

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HTML5

Getting Started

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional//EN" "http://www.w3.o
rg/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
```

becomes

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8" />
<title>My Title</title>
</head>
</html>
```

charset required for validation
title required in head section

<http://validator.w3.org/>

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New Features in HTML5

- ◆ Canvas element
 - » for drawing
- ◆ Video and audio elements
 - » media playback
- ◆ New content specific elements
 - » article, footer, header, nav, section
 - » many of these new elements are ways of adding extra semantic info to a webpage
- ◆ New form controls
 - » calendar, date, time, email, url, search

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Canvas

- ◆ Used to draw graphics in a rectangular area on a web page
 - » paths, boxes, circles, characters, images

```
<canvas id="myCanvas" width="200" height="100">  
</canvas>
```

- ◆ Canvas just defines the area, drawing must be done with JavaScript

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Canvas Example

Red Rectangle

```
<script type="text/javascript">

// use id to find canvas element
var c=document.getElementById("myCanvas");

// create a context object (built-in HTML5 object)
var ctx=c.getContext("2d");

// draw a red rectangle
ctx.fillStyle="#FF0000";
ctx.fillRect(0,0,150,75); // 0,0 is upper-left

</script>
```

<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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Canvas Example

Lines

```
<script type="text/javascript">
// use id to find canvas element
var c=document.getElementById("canvas-2");
// create a context object
var ctx=c.getContext("2d");

// set start position for path
ctx.moveTo(10,10);

// add line from 10,10 to 150,50 to path
ctx.lineTo(150,50);

// add line from 150,50 to 10,50 to path
ctx.lineTo(10,50);

// actually draw the line
ctx.stroke();
</script>
```

<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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Canvas Example

Filled Blue Circle

```
<script type="text/javascript">
var c=document.getElementById("canvas-3");
var ctx=c.getContext("2d");

// set fill style
ctx.fillStyle="#0000FF";

// reset path
ctx.beginPath();

// add circle to the path
// parameters: x, y, radius, startAngle, endAngle [, anticlockwise ]
ctx.arc(70,18,15,0,Math.PI*2,true);

// mark the path as closed
ctx.closePath();

// fill in the shape
ctx.fill();
</script>
```

<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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Canvas Example

Gradient

```
<script type="text/javascript">
var c=document.getElementById("canvas-4");
var ctx=c.getContext("2d");

// create gradient rectangle
var grd=ctx.createLinearGradient(0,0,175,50);

// gradient colors
grd.addColorStop(0,"#FF0000");
grd.addColorStop(1,"#00FF00");

// set fill style to gradient colors
ctx.fillStyle=grd;

// fill a rectangle
ctx.fillRect(0,0,175,50);

</script>
```

<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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Canvas Example

Image

```
<script type="text/javascript">
window.onload=function()
{
var c=document.getElementById("canvas-5");
var ctx=c.getContext("2d");

// create a new image
var img=new Image();
img.src="img_flwr.png";

// draw the image in the canvas
ctx.drawImage(img,0,0);

// What would this line do?
// ctx.drawImage (img,0,-50);
}
</script>
```

<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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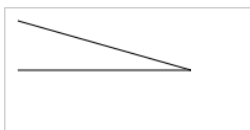
HTML5 Canvas Examples

(Adapted from http://www.w3schools.com/html5/html5_canvas.asp)

Red Rectangle



Lines



Filled Blue Circle



Gradient



Image

Image outside of the canvas:



Image constrained to the canvas:



<http://www.cs.odu.edu/~mweigle/cs312/html5/canvas-ex.html>

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Fancy Canvas Examples

- ◆ Interactive canvas gradient
 - » <http://html5demos.com/canvas-grad>
- ◆ Animated spinner inside canvas
 - » <http://html5demos.com/canvas>

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HTML5 Video

- ◆ Allows for video playback without Flash
- ◆ Three supported formats
 - » MP4, WebM, Ogg
- ◆ Good idea to use width and height attributes
- ◆ Controls attribute provides play, pause, volume
- ◆ Source displayed will be first one that's supported

```
<video width="320" height="240" controls="controls">
  <source src="movie.mp4" type="video/mp4" />
  <source src="movie.ogv" type="video/ogg" />
  Your browser does not support the video tag.
</video>
```

http://www.w3schools.com/html5/tryit.asp?filename=tryhtml5_video_all

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HTML5 Audio

- ◆ Provides a standard for playing audio
 - » sound files or an audio stream
- ◆ Three supported formats
 - » Ogg Vorbis, MP3, Wav
- ◆ Controls attribute provides play, pause, volume
- ◆ Source played will be first one that's supported

```
<audio controls="controls">
  <source src="song.ogg" type="video/ogg" />
  <source src="song.mp3" type="video/mpeg" />
  Your browser does not support the audio element.
</audio>
```

http://www.w3schools.com/html5/tryit.asp?filename=tryhtml5_audio_all

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New Markup Elements

- | | |
|--|--|
| <ul style="list-style-type: none">◆ Sections<ul style="list-style-type: none">» article» summary» section» header<ul style="list-style-type: none">❖ essentially to replace <div id="header">» footer<ul style="list-style-type: none">❖ replace <div id="footer">» nav<ul style="list-style-type: none">❖ replace <div id="nav"> | <ul style="list-style-type: none">◆ Grouping<ul style="list-style-type: none">» figure» figcaption◆ Interaction<ul style="list-style-type: none">» command◆ Text-level<ul style="list-style-type: none">» mark» time» wbr |
|--|--|

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HTML5 Forms

- ◆ New Input Types
 - » email
 - » url
 - » number
 - » range
 - » Date pickers (date, month, week, time, ...)
- ◆ Allow for automatic validation when the form is submitted
- ◆ <output> tag
- ◆ New attributes
 - » pattern
 - » placeholder
 - » required

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HTML5 Forms

Examples

General Format:

```
<form action="http://www.w3schools.com/html5/demo_form.asp" method="get">  
Input Tag  
<input type="submit" />  
</form>
```

<input> Examples:

```
E-mail: <input type="email" name="user_email" /><br />
```

```
Homepage: <input type="url" name="user_url" /><br />
```

```
Enter a number between 1-10: <input type="number"  
name="num" min="1" max="10" />
```

```
Points: <input type="range" name="points-level" min="1"  
max="10" />
```

Examples: <http://www.cs.odu.edu/~mweigle/cs312/html5/input-type.html>

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HTML5 Forms

Date Picker Examples

General Format:

```
<form action="http://www.w3schools.com/html5/demo_form.asp" method="get">
```

Input Tag

```
<input type="submit" />
</form>
```

<input> Examples:

```
Date: <input type="date" name="user_date" />
```

```
Month: <input type="month" name="user_month" />
```

```
Week: <input type="week" name="user_week" />
```

```
Time: <input type="time" name="user_time" />
```

```
Date and Time: <input type="datetime" name="user_datetime" />
```

```
Date and Time (local): <input type="datetime-local"
name="user_datetime-local" />
```

Examples: <http://www.cs.odu.edu/~mweigle/cs312/html5/input-type.html>

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HTML5 Forms

Output Example

```
<form oninput="x.value = parseInt(a.value) +
parseInt(b.value)">0
<input type="range" name="a" value="50" />100
+ <input type="number" name="b" value="50" />
= <output name="x" for="a b"></output>
</form>
```

Examples: <http://www.cs.odu.edu/~mweigle/cs312/html5/input-type.html>

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HTML5 Forms

Attributes Examples

General Format:

```
<form action="http://www.w3schools.com/html5/demo_form.asp" method="get">
```

Input Tag

```
<input type="submit" />
</form>
```

<input> Examples:

```
Country code: <input type="text"
name="country_code" pattern="[A-z]{3}"
title="Three letter country code" />
```

```
<input type="search" name="user_search"
placeholder="Search W3Schools" />
```

```
Name: <input type="text" name="usr_name"
required="required" />
```

Examples: <http://www.cs.odu.edu/~mweigle/cs312/html5/input-type.html>

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HTML5 Meter and Progress Elements

◆ <meter>

» defines a scalar measurement within a known range, or a fractional value - also known as a gauge.

» example:

http://www.w3schools.com/html5/tryit.asp?filename=tryhtml5_meter

◆ <progress>

» represents the progress of a task

» example:

http://www.w3schools.com/html5/tryit.asp?filename=tryhtml5_progress

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HTML5 Reference

- ◆ Many new tags and events added
- ◆ Tags
 - » http://www.w3schools.com/html5/html5_reference.asp
- ◆ Events
 - » http://www.w3schools.com/html5/html5_ref_eventattributes.asp

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What is jQuery?

- ◆ A JavaScript library that greatly simplifies JavaScript programming
- ◆ Features
 - » HTML element selections
 - » HTML element manipulation
 - » CSS manipulation
 - » HTML event functions
 - » JavaScript effects and animations
 - » HTML DOM traversal and modification
 - » AJAX
 - » Utilities

Lecture Resources:
<http://www.w3schools.com/jquery/>

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jQuery

Getting Started

- ◆ The jQuery library is stored as a single JavaScript file, containing all the jQuery methods.

```
<head>
<script type="text/javascript" src="http://
ajax.googleapis.com/ajax/libs/jquery/1.4.2/
jquery.min.js"></script>
</head>
```

- ◆ `<script>` tag should be inside the page's `<head>` section
- ◆ This version is hosted by Google. There are other versions available for download (jquery.com) or hosted by Microsoft.

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Syntax

- ◆ The jQuery syntax is tailor made for selecting HTML elements and performing some action on the element(s).
- ◆ Basic syntax is: `$(selector).action()`
 - » `$` - to define jQuery
 - » `(selector)` - to "query (or find)" HTML elements
 - » jQuery `action()` - to be performed on the element(s)

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\$(document).ready

- ◆ All jQuery methods in the examples are inside a `$(document).ready()` function:

```
$(document).ready(function() {  
  
    // jQuery functions go here...  
  
});
```

- ◆ This is to prevent any jQuery code from running before the document is finished loading (is ready).

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jQuery Selectors

`$(selector).action()`

- ◆ Can select HTML elements by name, attribute name, or content
- ◆ Examples:
 - » `$("p")` – selects all `<p>` elements
 - » `$("p.intro")` – selects all `<p class="intro">` elements
 - » `$("p#demo")` – selects all `<p id="demo">` elements
 - » `$("[href]")` – selects all elements with an href attribute
 - » `$("[href$='.jpg']")` – selects all elements with an href attribute that ends with ".jpg"
 - » `$("ul li:first")` – selects the first `` element of each ``
- ◆ jQuery selector test
 - » http://www.w3schools.com/jquery/trysel.asp?filename=trysel_basic

List of jQuery Selectors:

http://www.w3schools.com/jquery/jquery_ref_selectors.asp

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jQuery Events

`$(selector).action()`

- ◆ Event handling methods are core functions in jQuery
 - » are called when “something happens” in HTML
- ◆ Action called when something is selected can be a function

```
$(selector).action(function() {  
    // JavaScript or jQuery code here  
});
```

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jQuery Events

Example

- ◆ When the user clicks the button, hide all of the `<p>` elements on the page

```
$("#button").click (function() {  
    // when button is clicked  
    $("p").hide(); // hide all <p> elements  
})
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/clickToHide.html>

List of jQuery Events:

http://www.w3schools.com/jquery/jquery_ref_events.asp

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jQuery Effects

- ◆ hide
- ◆ toggle
- ◆ slideDown
 - » speeds can be “slow”, “fast”, “normal”, or a number of milliseconds
- ◆ slideUp
- ◆ slideToggle
- ◆ fadeIn
- ◆ fadeOut
- ◆ fadeTo
 - » fade to specified opacity
- ◆ animate

List of jQuery Effects:

http://www.w3schools.com/jquery/jquery_ref_effects.asp

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jQuery Effects

Hide/Show Examples

```
$("#hide").click(function() {  
    $("#hideme").hide();  
});
```

```
$("#show").click(function() {  
    $("#hideme").show();  
});
```

```
$("#hideslow").click(function() {  
    $("#hideme").hide(1000);  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/effects-ex.html>

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jQuery Effects

Slide Examples

```
$(".slidedown").click(function() {  
    $(".panel").slideDown("slow");  
});
```

```
$(".slideup").click(function() {  
    $(".panel").slideUp("slow");  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/effects-ex.html>

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jQuery Effects

Fade Examples

```
$("button#fade25").click(function() {  
    $("div.fading").fadeTo("slow",0.25);  
});
```

```
$("button#fadeout").click(function() {  
    $("div.fading").fadeOut("normal");  
});
```

```
$("button#fadein").click(function() {  
    $("div.fading").fadeIn("fast");  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/effects-ex.html>

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jQuery Effects

Animate Examples

```
$("#button#start").click(function() {  
    $("#div#animate").animate({height:200},"slow");  
    $("#div#animate").animate({width:200},"slow");  
    $("#div#animate").animate({height:100},"slow");  
    $("#div#animate").animate({width:100},"slow");  
});
```

```
$("#button#start2").click(function() {  
    $("#div#animate2").animate({left:"100px"},"slow");  
    $("#div#animate2").animate({fontSize:"3em"},"slow");  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/effects-ex.html>

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Using jQuery to Manipulate HTML

- ◆ `$(selector).html(content)`
 - » change the contents of matching HTML elements
- ◆ `$(selector).append(content)`
 - » appends content to the inside of matching HTML elements
- ◆ `$(selector).prepend(content)`
 - » prepends content to inside of matching HTML elements
- ◆ `$(selector).before(content)`
 - » inserts HTML content before all matching elements
- ◆ `$(selector).after(content)`
 - » inserts HTML content after all matching elements

jQuery HTML methods:

http://www.w3schools.com/jquery/jquery_ref_html.asp

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Using jQuery to Manipulate HTML

◆ With JavaScript:

```
document.getElementById("myname").innerHTML = "my text";
```

◆ With jQuery:

```
$("#myname").html("mytext");
```

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jQuery Methods

Examples

```
$("button#replace").click(function() {  
    $("#changeme").html("Modified text");  
});
```

```
$("button#append").click(function() {  
    $("#changeme").append("APPEND");  
});
```

```
$("button#prepend").click(function() {  
    $("#changeme").prepend("PREPEND");  
});
```

```
$("button#after").click(function() {  
    $("#changeme").after("AFTER");  
});
```

```
$("button#before").click(function() {  
    $("#changeme").before("BEFORE");  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/methods-ex.html>

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jQuery and CSS

- ◆ jQuery has one main method for manipulating CSS: `css()`
- ◆ `css(name)`
 - » return CSS property value
- ◆ `css(name, value)`
 - » set CSS property and value
- ◆ `css({properties})`
 - » set multiple CSS properties and values

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jQuery and CSS

- ◆ Can also change width and height
- ◆ `width("width")`
- ◆ `height("height")`

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jQuery CSS

Examples

```
$("button#toYellow").click(function() {  
    $("#changeme").css("background-color", "yellow");  
});
```

```
$("button#toBlueAndFont").click(function() {  
    $("#changeme").css({"background-color": "blue",  
    "font-size": "200%", "border": "solid"});  
});
```

```
$("button#grow_tall").click(function() {  
    $("#changeme").height("300px");  
});
```

```
$("button#grow_skinny").click(function() {  
    $("#changeme").width("200px");  
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/css-ex.html>

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jQuery and AJAX

- ◆ jQuery provides a rich set of methods for AJAX development
- ◆ You can request TXT, HTML, XML data from a remote server using HTTP GET or POST

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jQuery and AJAX

- ◆ `$(selector).load("url")`
 - » replace text in *selector* with file loaded at *url*
- ◆ `$.get("url", callback_fn)`
 - » use AJAX GET request
- ◆ `$.post("url", data, callback_fn)`
 - » use AJAX POST request
- ◆ `$.ajax({name:value, name:value, ...})`
 - » offers more functionality
 - » `url:url`
 - » `type:GET,POST`
 - » `data:{data}`
 - » `success:callback_fn`

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jQuery and AJAX

Load a File Examples

```
$("#button#load").click(function() {  
    $("#changeme").load("test_xmlhttp.txt");  
});
```

```
$("#button#load-ajax").click(function() {  
    $.ajax({url:"test_xmlhttp2.txt", success:function(result) {  
        $("#changeme").html(result);  
    }});  
});
```

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jQuery and AJAX

Post, Get Examples

```
$("#button#post").click(function(){
    $.post("echo.php", {var1:"POST Hello", var2:"World"}, function
(result){
    $("#changeme").html(result);}
    );
});
```

```
$("#button#get").click(function(){
    $.get("echo.php?var1=GET+Hello&var2=World", function(result){
    $("#changeme").html(result);}
    );
});
```

```
$("#button#post-ajax").click(function(){
    $.ajax({url:"echo.php", type:"POST", data:{var1:".ajax POST
Hello", var2:"World"}, success:function(result){
    $("#changeme").html(result);}
    });
});
```

<http://www.cs.odu.edu/~mweigle/cs312/jquery/ajax-ex.html>

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jQuery and AJAX

- ◆ Think about how you could implement some of our AJAX examples (and your programming projects) with jQuery
- ◆ What elements could it replace?

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