

Web Development Technologies: jQuery

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CSE316: Fundamentals of Software Development

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<http://www.cs.stonybrook.edu/~cse316>

jQuery

- A JavaScript library
- Makes numerous tasks easier
- Browser independent
- Capabilities include:
 - **HTML/DOM manipulation**
 - **CSS manipulation**
 - **HTML event methods**
 - **Effects and animations**
 - **AJAX**

jQuery

- Adding jQuery to web site
- Download from <https://jquery.com>
 - Production version ← Use this for live websites
 - Use the compressed release: <https://code.jquery.com/jquery-3.5.1.min.js>
 - Development version ← Use for testing
 - Place library in same folder as web pages
 - To include, use:

```
<head>
```

```
<script src="jquery-3.5.1.min.js"></script>
```

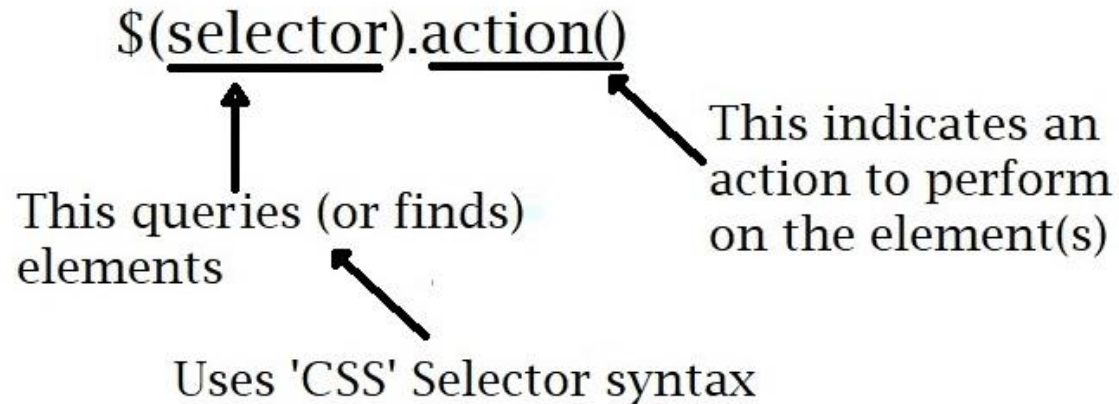
```
</head>
```

- Include jQuery from a CDN (Content Delivery Network), like Google or MS

```
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>
```

jQuery

- Syntax:



- Examples:

- `$("p").hide()` – Hides all paragraphs ('p' elements)
- `$(".test").hide()` – Hides all elements with **class** of **test**
- `$("#test").hide()` – Hides elements with an **id** of **test**

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

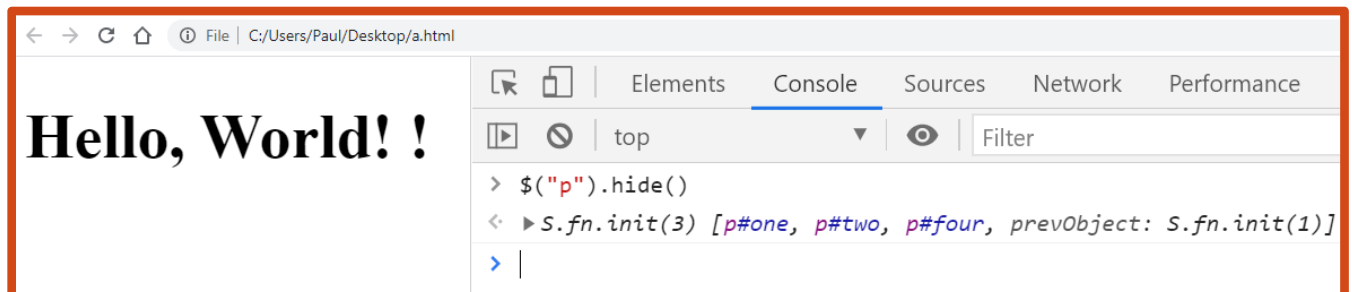
Hello, World! !

This is text from paragraph 1

This is text from paragraph 2

This is text from paragraph 4

```
> $("p").hide()
```



```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

Hello, World! !

This is text from paragraph 1

This is text from paragraph 2

This is text from paragraph 4

```
> $("#one").hide();
```

Hello, World! !

This is text from paragraph 2

This is text from paragraph 4

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one" class="class1">This is text from paragraph 1</p>
<p id="two" class="class1">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

Hello, World! !

This is text from paragraph 1

This is text from paragraph 2

This is text from paragraph 4

```
> $(".class1").hide();
```

Hello, World! !

This is text from paragraph 4

jQuery – More on Selectors

- Other selector forms:
 - ("p.class1") – Paragraphs with class of class1
 - ("ul li:first") – First element in first
 - ("ul li:first-child") - First of every
 - ("[href]") – Any element with an href attribute
 - ("a[target='_blank']") – All **anchors** with a **target** attribute equal to **_blank**
 - ("tr:even") – Selects all even <tr> (row in a table) elements
 - (tr:odd") – Selects all odd <tr> elements


```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one" class="class1">This is text from paragraph 1</p>
<p id="two" class="class1">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

Hello, World! !

This is text from paragraph 1

This is text from paragraph 2

This is text from paragraph 4

```
> $("p.class1").hide();
```

Hello, World! !

This is text from paragraph 4

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

Hello, World! !

This is text from paragraph 1

This is text from paragraph 2

This is text from paragraph 4

```
> $("p.first").hide();
```

Hello, World! !

This is text from paragraph 2

This is text from paragraph 4

```

<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<ul>
  <li>one</li>
  <li>two</li>
  <li>three</li>
</ul>
<ul>
  <li>one</li>
  <li>two</li>
  <li>three</li>
</ul>
</body>
</html>

```

Hello, World! !

- one
 - two
 - three
-
- one
 - two
 - three

```
> $("ul li:first").hide();
```

Hello, World! !

- two
 - three
-
- one
 - two
 - three

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<ul>
  <li>one</li>
  <li>two</li>
  <li>three</li>
</ul>
<ul>
  <li>one</li>
  <li>two</li>
  <li>three</li>
</ul>
</body>
</html>
```

Hello, World! !

- one
 - two
 - three
-
- one
 - two
 - three

```
> $("ul li:first-child").hide();
```

Hello, World! !

- two
 - three
-
- two
 - three

```

<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<ul>
  <li>
    <a href="https://www3.cs.stonybrook.edu/~pfodor/courses/cse216.html">CSE216</a>
  </li>
  <li>
    <a href="https://www3.cs.stonybrook.edu/~pfodor/courses/cse316.html">CSE316</a>
  </li>
  <li>
    <a href="https://www3.cs.stonybrook.edu/~pfodor/courses/cse416.html">CSE416</a>
  </li>
</ul>
</body>
</html>

```

Hello, World! !

- [CSE216](#)
- [CSE316](#)
- [CSE416](#)

```
> $("[href]").hide();
```

Hello, World! !

-
-
-

jQuery – DOM Events

- jQuery supports catching most DOM events
 - Mouse Events
 - click
 - dblclick
 - mouseenter
 - mouseleave
 - Keyboard Events
 - keypress
 - keydown
 - keyup

jQuery – DOM Events

- Form Events
 - submit
 - change
 - focus
- Document Events
 - load
 - resize
 - scroll

jQuery – DOM Events – Use in jQuery

- Syntax:

\$(selector).eventname(action)

↑
finds elements

↑
event for which to watch

↘
action to perform -
[anonymous function with javascript code]

jQuery – Event Examples

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js">
</script>
</head>
<body>
<h1>Hello, World! !</h1>
<p id="one" class="class1">This is text from paragraph 1</p>
<p id="two" class="class1">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>

<script>
$("#one").mouseenter(function(){
    // When mouse enters element with id=p1, put up alert dialog
    alert("You entered p1!");
});
</script>

</body>
</html>
```

This page says

You entered p1!

OK

jQuery – Event Examples

```
$("#input").focus(function(){
```

```
    // When an 'input' element gets focus, change color to grey
```

```
    $(this).css("background-color", "#cccccc");
```

```
});
```

```
<!DOCTYPE html>
```

```
<html>
```

```
<body>
```

```
<form action="/action_page.php">
```

```
...
```

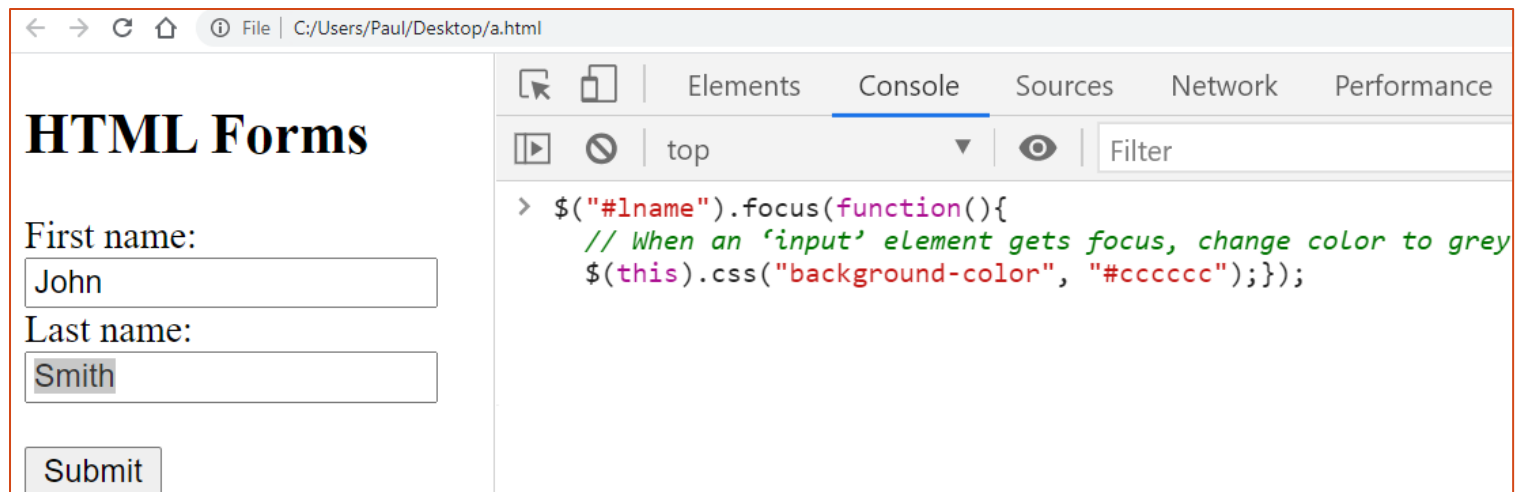
```
<input type="text" id="lname" name="lname" value="Smith"><br><br>
```

```
...
```

```
</form>
```

```
</body>
```

```
</html>
```



jQuery – Event Examples

Handling multiple events:

```
$("#p").on({  
  mouseenter: function(){  
    $(this).css("background-color", "lightgray");  
  },  
  mouseleave: function(){  
    $(this).css("background-color", "lightblue");  
  },  
  click: function(){  
    $(this).css("background-color", "yellow");  
  }  
});
```

This example shows how to change CSS attribute values in an event handler!

When mouse enters a paragraph, change background color to light gray

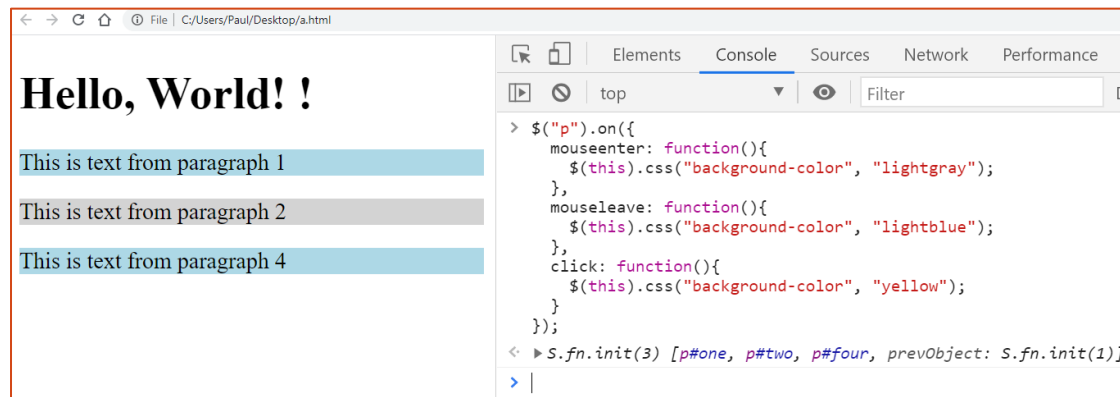
When mouse leaves a paragraph, change background color to light blue

When mouse button is clicked on a paragraph, change background color to yellow

jQuery – Event Examples

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js"></script>
</head>
<body>
<div id="p1">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
</div>
</body>
</html>
```

```
$( "p" ).on({
  mouseenter: function(){
    $(this).css("background-color", "lightgray");
  },
  mouseleave: function(){
    $(this).css("background-color", "lightblue");
  },
  click: function(){
    $(this).css("background-color", "yellow");
  }
});
```



jQuery - Effects

- jQuery supports some 'effects' on elements
 - **hide()** – hide an element (make it disappear)
 - **show()** – show an element
 - **toggle()** – switch between hiding and showing an element

jQuery

- Hide/Show have options to indicate speed and a callback function.
[Callback functions allow actions after the effect is entirely completed]
 - **hide(<speed>), hide(<speed>, <callback>)** – Speed can be **slow, fast,** or a number of milliseconds
`$("#p").hide(1000, alert("Test"));`
 - **show(<speed>, <callback>)**
- Fade methods – Each allow a 'speed' parameters
 - **fadeOut()**
`$("#p").fadeOut(1000);`
 - **fadeIn()**
 - **fadeToggle()**
`$("#p").fadeToggle(1000);`
- Slide methods – Each allow 'speed' and 'callback' parameters
 - **slideUp()**
`$("#p").slideUp();`
 - **slideDown()**
 - **slideToggle()**

jQuery – Effects Examples

```
$("#button").click(function(){  
    $("p").hide(1000);  
});
```

Hide paragraphs when the button is clicked

```
$("#button").click(function(){  
    $("#div1").fadeIn();  
    $("#div2").fadeIn("slow");  
    $("#div3").fadeIn(3000);  
});
```

When button is clicked, fade in three 'divs' at different rates.

```
$("#flip").click(function(){  
    $("#panel").slideToggle();  
});
```

When button is clicked slide a panel down/up

DOM – Action Example

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js"></script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
<button onclick="document.getElementById('two').parentNode
    .removeChild(document.getElementById('two'));">
    Click to hide 2
</button>
</div>
</body>
</html>
```


jQuery – Action Example

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Document</title>
<script src="https://code.jquery.com/jquery-3.5.1.min.js"></script>
</head>
<body>
<div id="theDiv">
<h1>Hello, World! !</h1>
<p id="one">This is text from paragraph 1</p>
<p id="two">This is text from paragraph 2</p>
<p id="four">This is text from paragraph 4</p>
<button>Click to hide 2</button>
</div>
<script>
    $("button").click(function(){$("#two").hide();});
</script>
</body>
</html>
```

jQuery – HTML Element and Attribute Manipulation

- jQuery has facilities to **query or update** html content and attribute values
- Main methods:
 - **text()** - Sets or returns text content of elements
 - **html()** – Sets or returns content of selected elements (including HTML markup)
 - **val()** – Sets or returns value of form fields
 - **attr()** – Get attribute value

jQuery

```
$("#btn1").click(function(){  
    alert("Text: " + $("#one").text());  
});
```

First button displays text from element with **id test**

```
$("#btn2").click(function(){  
    alert("HTML: " + $("#one").html());  
});
```

Second button displays text with html markup from element with **id test**.

```
$("#btn3").click(function(){  
    alert($("#three").attr("href"));  
});
```

When button btn3 is clicked, an alert dialog displays the **href** attribute of the element with **id three**.

jQuery – Setting content

```
$("#btn1").click(function(){  
    $("#test1").text("Hello world!");  
});
```

// Button 1 sets value of content in element with **id test1** to the string *'Hello, world!'*

```
$("#btn2").click(function(){  
    $("#test2").html("<b>Hello world!</b>");  
});
```

// Button 2 sets the HTML content of element with **id test2** to *'Hello, world!'* with bold tags around the string.

```
$("#btn3").click(function(){  
    $("#test3").attr("href", "https://www.cs.stonybrook.edu");  
});
```

// Button 3 click changes the **href** attribute of element with **id test3** to the new URL

jQuery - Modifying HTML content

- jQuery can update content
 - **append()** – Append content to an element
 - **prepend()** – Prepend content to an element
 - **after()** – Insert content after a named element
 - **before()** – insert content before a named element
 - **remove()** – Removes selected element and children
 - **empty()** – removes child elements of the selected element

jQuery – Modifying HTML content - Example

```
$("#h1").append("Extended header text")
```

```
$("#p").prepend("Added text at beginning of a paragraph")
```

```
$("#img").before("<p><b>Add this before all images</b></p>")
```

```
$("#img").after("<p><i>Add this after all images</i></p>")
```

```
$("#ul1").remove()
```

```
$("#ul1").empty()
```

jQuery – Manipulating style

- jQuery can fetch and update css style information
- Apply .css() method to element set

- form 1

`$(selector).css("propertyname")`

– *Returns the value of propertyname on the element*

- form 2a

`$(selector).css("propertyname", "newvalue")`

– Sets the value of propertyname to newvalue.

- form 2b - Can set multiple properties with:

`$(selector).css({"propname1":"value1","propname2":"value2",...})`

jQuery – Methods to traverse DOM tree

- jQuery provides methods to traverse a document
 - **.parent()** – Returns parent of the element
 - **.parents()** – Returns chain of parents of element back to <html>
 - **.children()** – Returns children of the element
 - **.find()** – Searches for an element within the descendants of the selected element
 - **.siblings()** – Returns all siblings of a certain element type
 - **.next()** – Next sibling
 - **.nextAll()** – List of following siblings
 - **.nextUntil()** – List of following siblings stopping before a name sibling
 - **.prev()** – Previous sibling
 - **.prevAll()** – List of previous siblings
 - **.prevUntil()** – List of previous siblings until a named sibling is reached