

# Web Development Frameworks

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# Overview

- Web development frameworks are software frameworks for web development that simplify common tasks
- **Bootstrap** is a HTML/CSS/JavaScript framework for developing responsive, mobile first applications
  - Developed by Twitter and released to the public in 2011
- **jQuery** is a JavaScript library for JavaScript programming created in 2006
- **Angular** is a TypeScript-based web application framework
  - Developed by Google
  - Angular (beginning with Angular 2+) is a rewrite of AngularJS which was a JavaScript framework and initially released in 2010
- **React** is a JavaScript library for developing user interfaces, developed and maintained by Facebook (now Meta) and initially released in 2013

# Bootstrap

- Can be included by loading the JavaScript and CSS libraries in the header of a page
- Basic design concepts
  - Responsive to changes in screen size (e.g., desktop vs. mobile)
    - Uses a grid system consisting of 12 columns
    - Includes collapsible navbars and other elements
- Use Bootstrap by specifying *classes*, e.g.
  - *col-sm-4* will create an element is 4 columns wide
    - Example: [https://www.w3schools.com/bootstrap5/bootstrap\\_grid\\_basic.php](https://www.w3schools.com/bootstrap5/bootstrap_grid_basic.php)
  - *btn* and *btn-primary* for buttons
    - Example: [https://www.w3schools.com/bootstrap5/bootstrap\\_buttons.php](https://www.w3schools.com/bootstrap5/bootstrap_buttons.php)
- Full tutorial: <https://www.w3schools.com/bootstrap5/index.php>

# Selected Bootstrap examples

- Bootstrap's grid system allows up to 12 (responsive) columns across the page:
  - [https://www.w3schools.com/bootstrap5/bootstrap\\_grid\\_basic.php](https://www.w3schools.com/bootstrap5/bootstrap_grid_basic.php)
- Bootstrap provides a variety of button styles:
  - [https://www.w3schools.com/bootstrap5/bootstrap\\_buttons.php](https://www.w3schools.com/bootstrap5/bootstrap_buttons.php)
- Bootstrap provides a variety of navigation bar styles:
  - [https://www.w3schools.com/bootstrap5/bootstrap\\_navbar.php](https://www.w3schools.com/bootstrap5/bootstrap_navbar.php)

# jQuery

- As of February 6, 2022, jQuery is used by 78% of the top 10 million websites: ([https://w3techs.com/technologies/overview/javascript\\_library](https://w3techs.com/technologies/overview/javascript_library))
- The basic jQuery framework involves applying an action to a set of elements as follows:
  - `$(selector).action()`
    - `$` - specifies we are using jQuery (you can also use *jQuery*)
    - `selector` – a CSS style selector to apply the action to (e.g., *p*, *div.class*)
    - `action()` – a function to apply to each element with the given selector
- Examples
  - `$("p").hide()` - hides all `<p>` elements.
  - `$(".test").hide()` - hides all elements with `class="test"`.
  - `$("#test").hide()` - hides the element with `id="test"`.
- Tutorial: <https://www.w3schools.com/jquery/default.asp>

# Common jQuery actions

Action	Description	Example
hide(), show(), or toggle()	Hides, shows, or toggles the element(s)	<code>\$("p").hide()</code>
html() or text()	Gets the innerHTML or innerText of an element	<code>\$("p#id").html()</code>
html("value") or text("value")	Sets the innerHTML or innerText of an element to the specified value	<code>\$("p#id").text("hello")</code>
addClass("class"), removeClass("class"), toggleClass("class")	Adds, removes, or toggles the class of an element	<code>\$("p").addClass("fancy")</code>
css("propertyname","value")	Sets the CSS property of an element	<code>\$("p").css("background-color", "yellow")</code>

# jQuery `document.ready()`

- It is good practice to call jQuery functions only after the page has been loaded. This is accomplished by including your jQuery code inside of *document.ready* event, which is the event fired after the document object model (DOM) is ready.
- Without doing this, jQuery may not be able to access all of the intended DOM elements
- In JavaScript, a *function* can be passed as an argument into another function (see JS\_function example)

# jQuery document.ready()

- The following statement uses jQuery to call a *function* after a page is loaded
  - `$(document).ready(function)`
- However anonymous functions are often used:

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

- The following is shortcut for the above notation:

```
$(function(){  
    // jQuery methods go here...  
});
```



# Handling events using jQuery

- Common events include *click()*, *doubleclick()*, *mouseenter()*, *mouseleave()*, and *hover()*
- For examples see
  - [https://www.w3schools.com/jquery/jquery\\_events.asp](https://www.w3schools.com/jquery/jquery_events.asp)
- When we handle events, we specify a function that should be called when the event is triggered, e.g.
  - `$("p").click(functionToCall)`
- However, the function to call is usually passed as an anonymous function

`// set onclick event of all paragraphs`

`$("p").click(function(){`

`// action goes here!!`

`$(this).hide(); // hides the current`

`element`

`});`

`$(this)` accesses the current element