Client-Side Web GIS

Bootstrap

Image from NASA: https://commons.wikimedia.org/wiki/File:Earth_Western_Hemisphere_transparent_background.png#filelinks

AmericaView
Empowering Earth Observation Education
AmericaView.org - Est. 2003

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What is a framework?

- Provides generic functionality that can be selectively changed by user-written code, thus providing application-specific software
- In this course, I will introduce the Bootstrap framework for CSS that can be used to style a webpage

https://www.w3schools.com/bootstrap4/default.asp

- Another example is the jQuery framework that simplifies the use of JavaScript.

https://www.w3schools.com/jquery/default.asp

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Bootstrap on W3schools.com

https://www.w3schools.com/bootstrap/bootstrap_ver.asp

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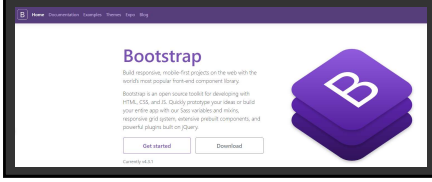
What is Bootstrap?

- Provides design templates using HTML, CSS, and JavaScript
- Free and open-source
- Front-end development
- Originally developed for Twitter



https://getbootstrap.com/

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Responsive Web Design

- Web design that allows automatic resizing, hiding, shrinking, or enlargement of webpage content so that it looks good on all devices (devices with different screen sizes)

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Media Queries

- Media Queries can be used to produce responsive content
- Uses @media rule to define a CSS property relative to a condition, generally a screen size
- We will not investigate media queries here
- We will introduce Bootstrap

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Accessing Bootstrap

- Can download the scripts and add them to your project
- Can reference the Content Delivery Network (CDN)
- Should use minimized code for speed

```
<head>
  <!-- Latest compiled and minified CSS -->
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.4.1/css/b
ootstrap.min.css">
  <!-- jQuery library -->
  <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.4.1/jquery.
min.js"></script>
  <!-- Popper JS -->
  <script
src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/u
md/popper.min.js"></script>
  <!-- Latest compiled JavaScript -->
  <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/4.4.1/js/boo
tstrap.min.js"></script>
</head>
```

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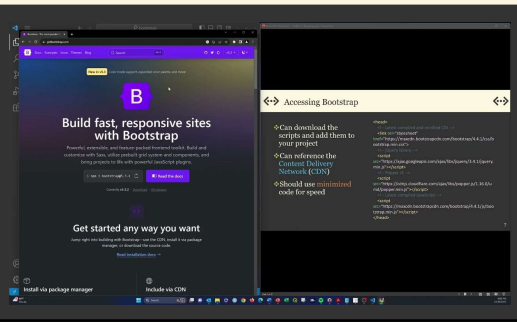
Video: Connecting to Bootstrap



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Using the Grid

- Break page into 12 columns or spans
- Can group columns or spans
- Grid system classes:
  - xs = screens less than 786px wide (phones)
  - sm = 786px to 992px (tablets)
  - md = 992px to 1200px (small laptops)
  - lg = greater than 1200px (laptops and desktops)
- Classes scale up

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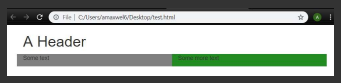
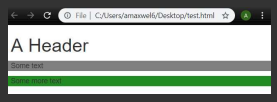
Grid Example 1

```
<body>
  <div class="container">
   <h1>A Header</h1>
   <div class="row">
    <div class="col-sm-6"
          style="background-
          color:gray;">
     <p>Some text</p>
   </div>
   <div class="col-sm-6"
          style="background-
          color:forestgreen;">
     <p>Some more text</p>
   </div>
   </div>
  </div>
</body>
</html>
```



Small or Larger



Extra Small

https://www.w3schools.com/bootstrap/bootstrap_grid_stacked_to_horizontal.asp

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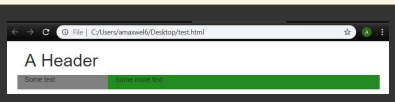
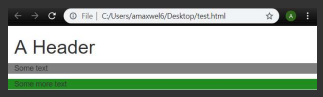
Grid Example 2

```
<body>
  <div class="container">
   <h1>A Header</h1>
   <div class="row">
    <div class="col-sm-3"      style="background-
color:gray;">
     <p>Some text</p>
   </div>
   <div class="col-sm-9"      style="background-
          color:forestgreen;">
     <p>Some more text</p>
   </div>
   </div>
  </div>
</body>
</html>
```



Small or Larger



Extra Small

https://www.w3schools.com/bootstrap/bootstrap_grid_small.asp

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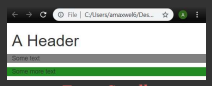
Grid Example 3

```
<body>
  <div class="container">
   <h1>A Header</h1>
   <div class="row">
    <div class="col-sm-3 col-md-6"
          style="background-
          color:gray;">
     <p>Some text</p>
   </div>
   <div class="col-sm-9 col-md-6"
          style="background-
          color:forestgreen;">
     <p>Some more text</p>
   </div>
   </div>
  </div>
</body>
</html>
```

Medium or Larger

Small



Extra Small

https://www.w3schools.com/bootstrap/bootstrap_grid_medium.asp

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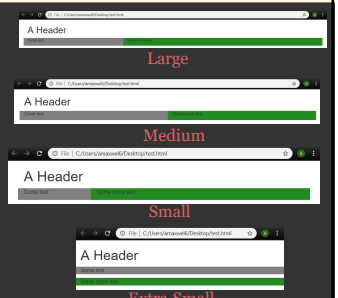
Grid Example 4

```
<body>
  <div class="container">
   <h1>A Header</h1>
   <div class="row">
    <div class="col-sm-3 col-md-6 col-lg-4"
          style="background-color:gray;">
      <p>Some text</p>
    </div>
    <div class="col-sm-9 col-md-6 col-lg-8"
          style="background-color:forestgreen;">
      <p>Some more text</p>
    </div>
    </div>
   </div>
</body>
</html>
```



https://www.w3schools.com/bootstrap/bootstrap_grid_large.asp

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More Examples of Grids

https://www.w3schools.com/bootstrap/bootstrap_grid_examples.asp

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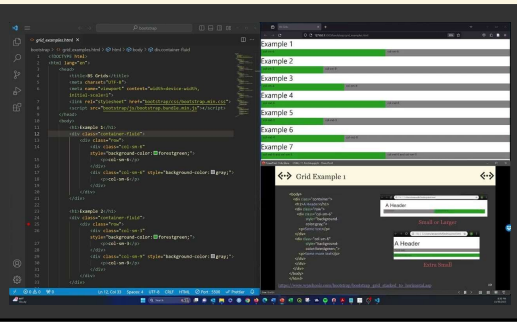
Video: Bootstrap Grid Examples



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Creating a Nav Bar

```
<nav class="navbar navbar-default">
  <div class="container-fluid">
    <!-- Brand and toggle get grouped for better mobile display -->
    <div class="navbar-header">
      <button type="button" class="navbar-toggle collapsed" data-toggle="collapse"
data-target="#bs-example-navbar-collapse-1"                aria-expanded="false">
        <span class="sr-only">Toggle navigation</span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
      </button>
      <a class="navbar-brand" href="../GISc.html" style="color:hover
#ffffff">Introduction to GIScience</a>
    </div>
    <!-- Collect the nav links, forms, and other content for toggling -->
    <div class="collapse navbar-collapse" id="bs-example-navbar-collapse-1">
      <ul class="nav navbar-nav">
        <li><a href="http://www.wvview.org/" target="_blank">WV View</a></li>
        <li><a href="../course_directory.html">Courses</a></li>
        <li><a href="http://maxwellar.wixsite.com/maxwell-
geospatial" target="_blank">Prof Maxwell</a></li>
      </ul>
    </div><!-- /.navbar-collapse -->
  </div><!-- /.container-fluid -->
</nav>
```

Nav Bar Example from W3schools.com

Active Link Link Disabled

Introduction to GIScience WV View Courses Prof Maxwell

https://www.w3schools.com/bootstrap4/bootstrap_navbar.asp

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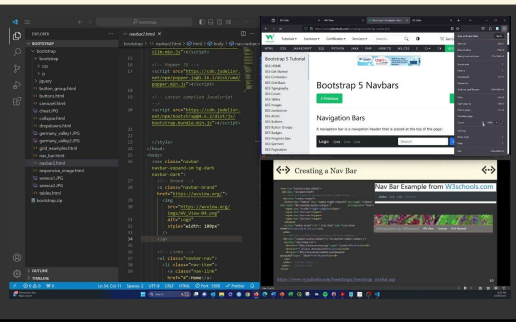
Video: Bootstrap Nav Bar



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More Nav Bar Examples

Bootstrap Navigation Bar

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Navigation Bars

A navigation bar is a navigation header that is placed at the top of the page:

WebSiteName Home Page 1 Page 2 Page 3

With Bootstrap, a navigation bar can extend or collapse, depending on the screen size.

A standard navigation bar is created with `<nav class="navbar navbar-default">`.

The following example shows how to add a navigation bar to the top of the page:

https://www.w3schools.com/bootstrap/bootstrap_navbar.asp

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Responsive Images

```
</head>
<body>
  <img src="gvalley.jpg" class="img-responsive">
</body>
</html>
```

https://www.w3schools.com/bootstrap4/bootstrap_images.asp

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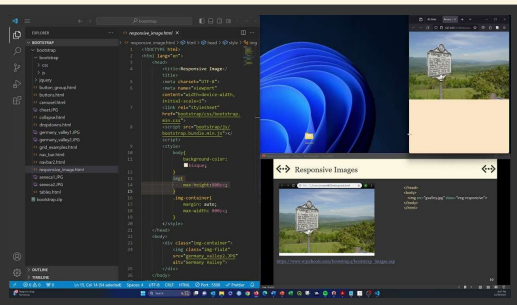
Video: Images



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Bootstrap Buttons

Button Styles

Basic | Default | Primary | Success | Info | Warning | Danger | Link

```
<body>
  <div class="container">
    <h2>Button Styles</h2>
    <button type="button" class="btn">Basic</button>
    <button type="button" class="btn btn-default">Default</button>
    <button type="button" class="btn btn-primary">Primary</button>
    <button type="button" class="btn btn-success">Success</button>
    <button type="button" class="btn btn-info">Info</button>
    <button type="button" class="btn btn-warning">Warning</button>
    <button type="button" class="btn btn-danger">Danger</button>
    <button type="button" class="btn btn-link">Link</button>
  </div>
</body>
```

https://www.w3schools.com/bootstrap/bootstrap_buttons.asp

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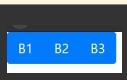
Button Groups




```
<div class="btn-group btn-group-lg">
  <button type="button" class="btn btn-primary">B1</button>
  <button type="button" class="btn btn-primary">B2</button>
<button type="button" class="btn btn-primary">B3</button>
```

https://www.w3schools.com/bootstrap4/bootstrap_forms_input_group.asp

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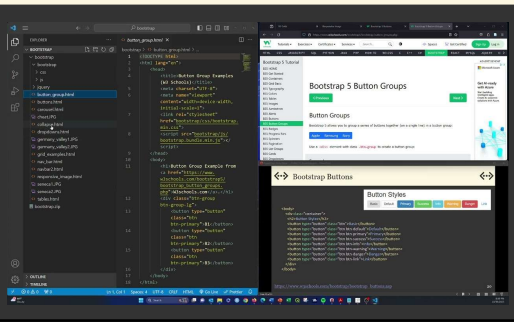
Video: Buttons



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Bootstrap Dropdowns

```
<body>
  <div class="container">
    <h2>Dropdowns</h2>
    <p>The .dropdown class is used to indicate a dropdown menu.</p>
    <p>Use the .dropdown-menu class to actually build the dropdown
menu.</p>
    <p>To open the dropdown menu, use a button or a link with a class
of .dropdown-toggle and data-
toggle="dropdown".</p>
    <div class="dropdown">
     <button class="btn btn-primary dropdown-toggle" type="button"
data-toggle="dropdown">Dropdown Example
      <span class="caret"></span></button>
      <ul class="dropdown-menu">
        <li><a href="#">HTML</a></li>
        <li><a href="#">CSS</a></li>
        <li><a href="#">JavaScript</a></li>
      </ul>
    </div>
  </div>
</body>
```

https://www.w3schools.com/bootstrap/bootstrap_dropdowns.asp

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Bootstrap Collapsible

https://www.w3schools.com/bootstrap4/bootstrap_collapse.asp

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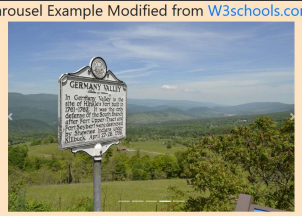
Bootstrap Carousel

```
<div id="demo" class="carousel slide" data-ride="carousel">
<!-- Indicators -->
<ul class="carousel-indicators">
  <li data-target="#demo" data-slide-to="0" class="active"></li>
  <li data-target="#demo" data-slide-to="1"></li>
  <li data-target="#demo" data-slide-to="2"></li>
</ul>
<!-- The slideshow -->
<div class="carousel-inner">
  <div class="carousel-item active">
    <img src="seneca2.jpg" alt="Seneca Rocks">
  </div>
  <div class="carousel-item">
    <img src="seneca1.jpg" alt="Seneca Rocks">
  </div>
  <div class="carousel-item">
    <img src="cheat.jpg" alt="Cheat River">
  </div>
</div>
<!-- Left and right controls -->
<a class="carousel-control-prev" href="#demo" data-slide="prev">
  <span class="carousel-control-prev-icon"></span>
</a>
<a class="carousel-control-next" href="#demo" data-slide="next">
  <span class="carousel-control-next-icon"></span>
</a>
</div>
```

Carousel Example Modified from W3schools.com



https://www.w3schools.com/bootstrap4/bootstrap_carousel.asp

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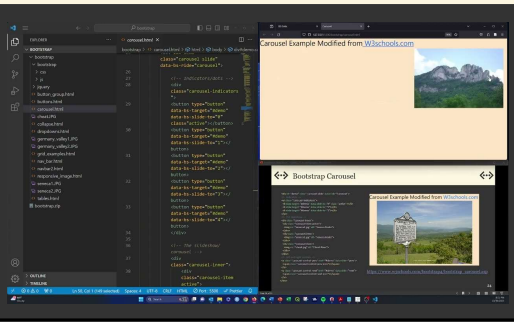
Video: Carousel



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Bootstrap Tables

See more table examples at W3school.com.

A	B	C
1A	1B	1c
2A	2B	2C
3A	3B	3C
4A	4B	4C

https://www.w3schools.com/bootstrap4/bootstrap_tables.asp

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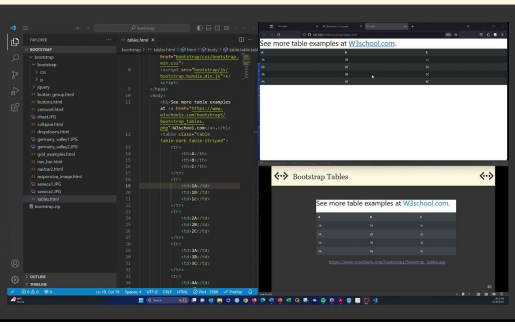
Video: Tables



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Tooltips and Popovers

Bootstrap 4 Tooltip

Previous

Bootstrap 4 Tooltip

The Tooltip component is small pop-up box that appears when the user moves the mouse pointer over an element:

Hover over me Hover over me

How To Create a Tooltip

To create a tooltip, add the `data-toggle="tooltip"` attribute to an element.

Use the `title` attribute to specify the text that should be displayed inside the tooltip:

https://www.w3schools.com/bootstrap4/bootstrap_tooltip.asp

https://www.w3schools.com/bootstrap4/bootstrap_popover.asp

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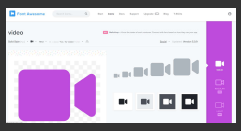
Icons and Glyphicon

- Bootstrap 3 provides an icon or glyphicon library
- Boostrap 4 does not
- However, there are many free icon libraries available
- You can also pay for access to libraries or create your own icons
- You can link to icons or store them in your website directory
- Icons are commonly provided in compressed raster (PNG) or vector graphic (SVG) format

https://www.flaticon.com/
https://fontawesome.com/
https://material.io/resources/icons/?style=baseline
https://thenounproject.com/



Example from Font Awesome

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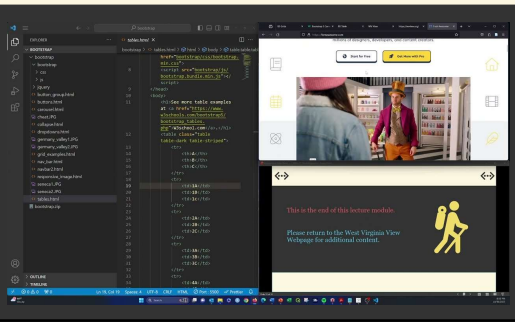
Video: Using Icons



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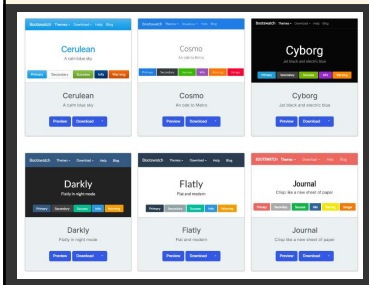
Themes using Bootstrap



https://bootswatch.com/

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Learn More Bootstrap

https://www.w3schools.com/bootstrap/bootstrap_ver.asp

https://getbootstrap.com/

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This is the end of this lecture module.

Please return to the West Virginia View Webpage for additional content.

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