

Web Programming **Bootstrap**

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CSS Frameworks

Fixed-width vs fluid layouts

- Fixed-width layout
 - Components inside a fixed-width wrapper have either percentage or fixed widths. Typically, grid systems.
- Fluid (or liquid) layout
 - Components have percentage widths (in % or em), thus adjust to the user's screen resolution



Responsive design

- Tailoring layout specifically for the type of screen
 - E.g., three column layout for desktops, a two column layout for tablets, and a single column layout on smartphones
- Using a fluid grid and media queries in CSS

Front-end frameworks

(a.k.a. CSS boilerplates)

- Provide a common structure
- Usually a mix of HTML, CSS, and JS code
- Typical components
 - Positioning blocks (often based on a grid system)
 - Typography style definitions for HTML elements
 - Solutions for browser (in)compatibility
 - Advanced components

Grid systems

- 960gs
<http://960.gs/>
- Golden grid
<http://goldengridsystem.com/>
- Responsive grid
<http://www.responsivegridsystem.com/>
- Gridiculo.us
<http://gridiculo.us/>

Complete frameworks

- Bootstrap
<http://getbootstrap.com/>
- Foundation
<http://foundation.zurb.com/>
- Gumby
<http://gumbyframework.com/>
- YAML
<http://www.yaml.de/>

Pros and cons for using frameworks

Advantages

- Speeds up processes
- Clean and tidy code
- Solutions to common CSS problems
- Browser compatibility
- Helpful in collaborative work

Disadvantages

- (Often) mixes content and presentation
- Overhead
- Slower learning curve
- You don't learn to do it yourself

960gs

960 Grid System

<http://960.gs/>

- Provide commonly used dimensions based on a width of 960 pixels
 - Why 960?
- 12 or 16 columns
 - can be used separately or in tandem
 - each column has 10px of margin on the left and right

Drupal, 12col grid

The screenshot shows the Drupal.org homepage using a 12-column grid layout. The top navigation bar includes links for Get Started, Community & Support, Documentation, Download & Extend, Marketplace, and About. The main header features the "Drupal" logo and a tagline "Come for the software, stay for the community". Below the header, there's a search bar and a sidebar with options to refine the search by Modules, Themes, Documentation, Forums & Issues, and Groups. The main content area is divided into three columns: "Why Choose Drupal?", "Sites Made with Drupal", and "Develop with Drupal". The "Why Choose Drupal?" section contains text about Drupal's flexibility and community, with a "Get Started with Drupal" button. The "Sites Made with Drupal" section highlights "The Economist" as a client, showing its logo and a snippet of its website. The "Develop with Drupal" section provides statistics on current activity and developer engagement. At the bottom, there's a map of the world with a red dot indicating the location of "DrupalCon Chicago" in March 2011. A sidebar on the right encourages users to "Get Drupal Security Announcements" and "Keep your site secure".

Drupal, 12col grid

The screenshot shows the Drupal.org homepage using a 12-column grid system. The layout is structured as follows:

- Column 1 (Blue):** Contains the "Drupal" logo and a sub-headline: "Come for the software, stay for the community".
- Column 2 (Blue):** Contains a brief description of what Drupal is: "Drupal is an open source content management platform used to power millions of websites and software applications. It's built, used, and supported by an active and diverse community of people from around the world."
- Column 3 (Blue):** Contains links: "Drupal Homepage", "Log In / Register", "Get Started", and "Why Choose Drupal?".
- Column 4 (Red):** Contains the heading "Why Choose Drupal?". Below it is a detailed paragraph about Drupal's flexibility and community support, followed by a "Get Started with Drupal" button.
- Column 5 (Red):** Contains the heading "Sites Made with Drupal". It features a thumbnail of "The Economist" website and a link to "Read more Drupal success stories".
- Column 6 (Red):** Contains the heading "Develop with Drupal". It includes a brief description, current activity statistics (modules, themes, developers), and links to "Drupal API", "Security Info", "Handbook", "Modules and Themes", and "Explore Drupal modules and themes".
- Column 7 (Red):** Contains a "This week" section with statistics (new modules, code commits, issues) and links to "Get Drupal Security Announcements" and "Keep your site secure".
- Column 8 (Red):** Contains a "News" section with a "Support Drupal by voting in the 2010 Open Source Awards" link and a date ("October 15, 2010").
- Column 9 (Red):** Contains a "Packt Publishing" section with a link to "Read more".
- Column 10 (Red):** Contains a "beta.drupal.org" section with a link to "Read more".
- Column 11 (Red):** Contains a "Distributed Authentication" section with a link to "Read more".
- Column 12 (Blue):** Contains a "Marketplace" and "About" link in the top right corner, along with a search bar and a "Search" button.

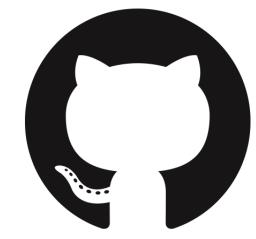
At the bottom, there are navigation links for "News", "Docs", "Updates", "Forum Posts", and "Commits". A note encourages users to "Support Drupal by voting in the 2010 Open Source Awards" on October 15, 2010.

Usage

- Each column has 10 pixels of margin on the left and right, which create 20 pixel wide gutters between columns

```
<div class="container_12"> → 12 or 16 columns  
  <div class="grid_*"> → * is the column width (1, 2, ... 12)  
    [...]  
  </div>  
  <div class="grid_*">  
    [...]  
  </div>  
  <div class="clear"></div> → separator between rows  
  <div class="grid_*">  
    [...]  
  </div>  
  [...]  
</div>
```

Exercise #1



[https://github.com/kbalog/web-programming/tree/master/
exercises/bootstrap](https://github.com/kbalog/web-programming/tree/master/exercises/bootstrap)

Solution

⌚ solutions/bootstrap/exercise1.html



```
<div class="container_12">  
  <div class="grid_6">  
    <div class="blue"></div>  
  </div>  
  <div class="grid_6">  
    <div class="blue"></div>  
  </div>  
  
  <div class="clear"></div>  
  
  <div class="grid_4">  
    <div class="yellow"></div>  
  </div>  
  <div class="grid_4">  
    <div class="yellow"></div>  
  </div>  
  <div class="grid_4">  
    <div class="yellow"></div>  
  </div>  
</div>
```

Bootstrap

Bootstrap

http://getbootstrap.com/

- Powerful front-end framework
- Developed by Twitter, open sourced in 2011
- Responsive, mobile-first
- Common HTML elements
- Custom HTML and CSS components
- jQuery plugins

Getting started

- Download or include it from CDN

```
<!DOCTYPE html>           HTML5 doctype is required!
<html lang="en">
<head>
  <title>Bootstrap Example</title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <!-- Latest compiled and minified CSS -->
  <link rel="stylesheet" href="http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/
css/bootstrap.min.css">
  <!-- jQuery library -->
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.0/
jquery.min.js"></script>
  <!-- Latest compiled JavaScript -->
  <script src="http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/js/
bootstrap.min.js"></script>
</head>
```

Bootstrap is mobile-first. To ensure proper rendering and touch zooming, include:

Containers

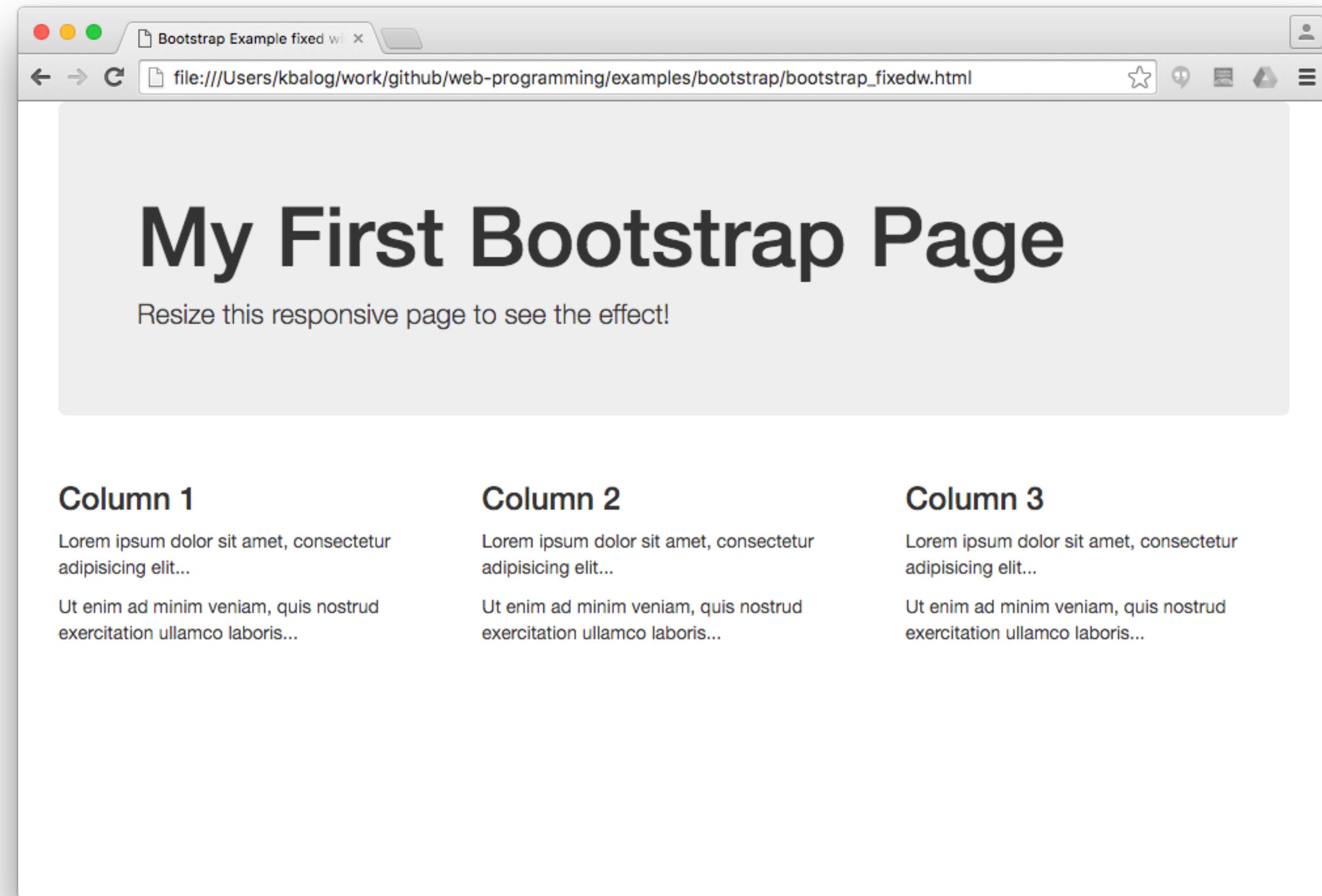
- Two container classes to wrap site contents

```
<div class="container">  
  
</div>
```

- **container** provides a responsive fixed width container
- **container-fluid** provides a full width container, spanning the entire width of the viewport
- Important: containers are not nestable

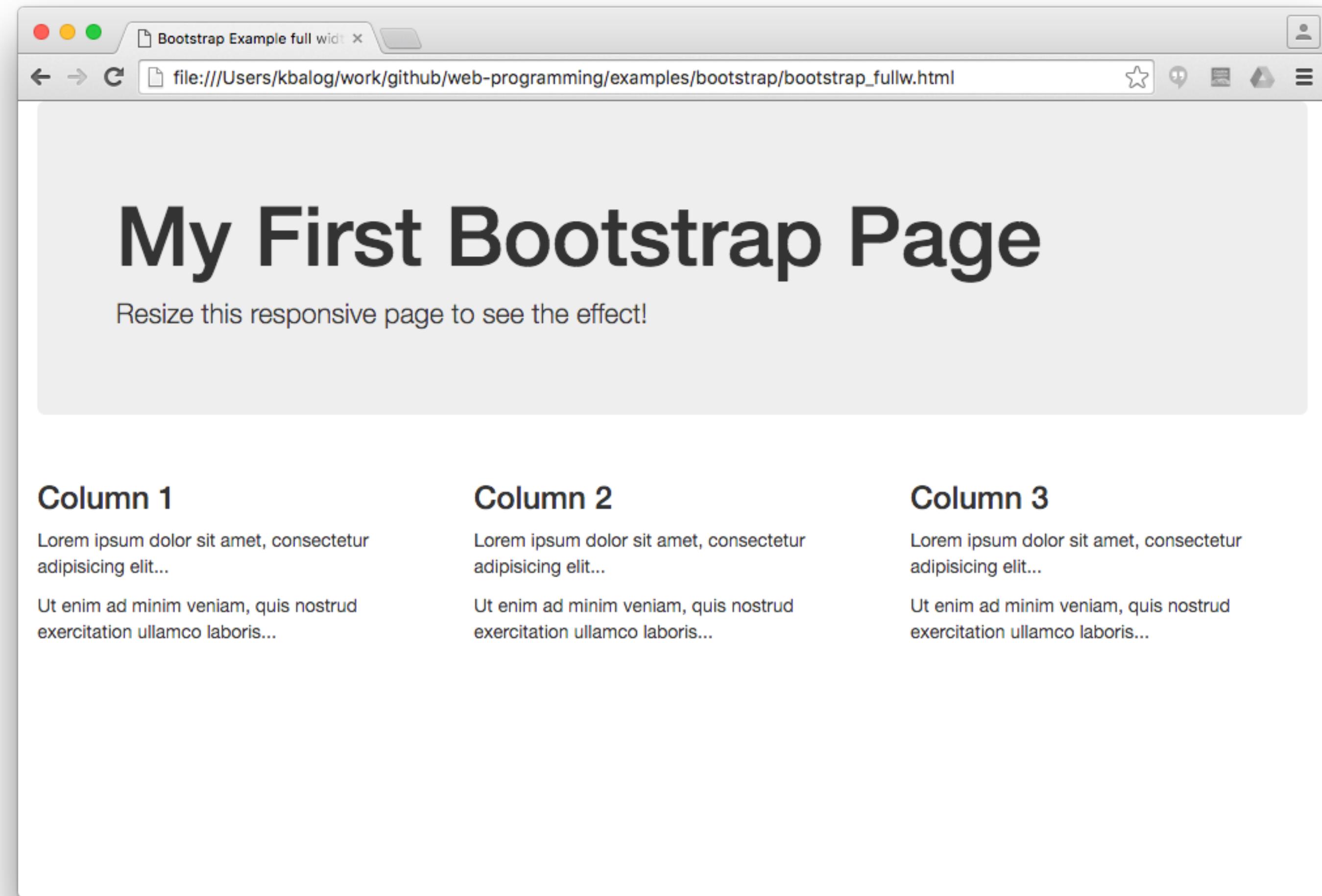
Example (fixed width)

examples/bootstrap/fixed_width.html



Example (full width)

examples/bootstrap/full_width.html



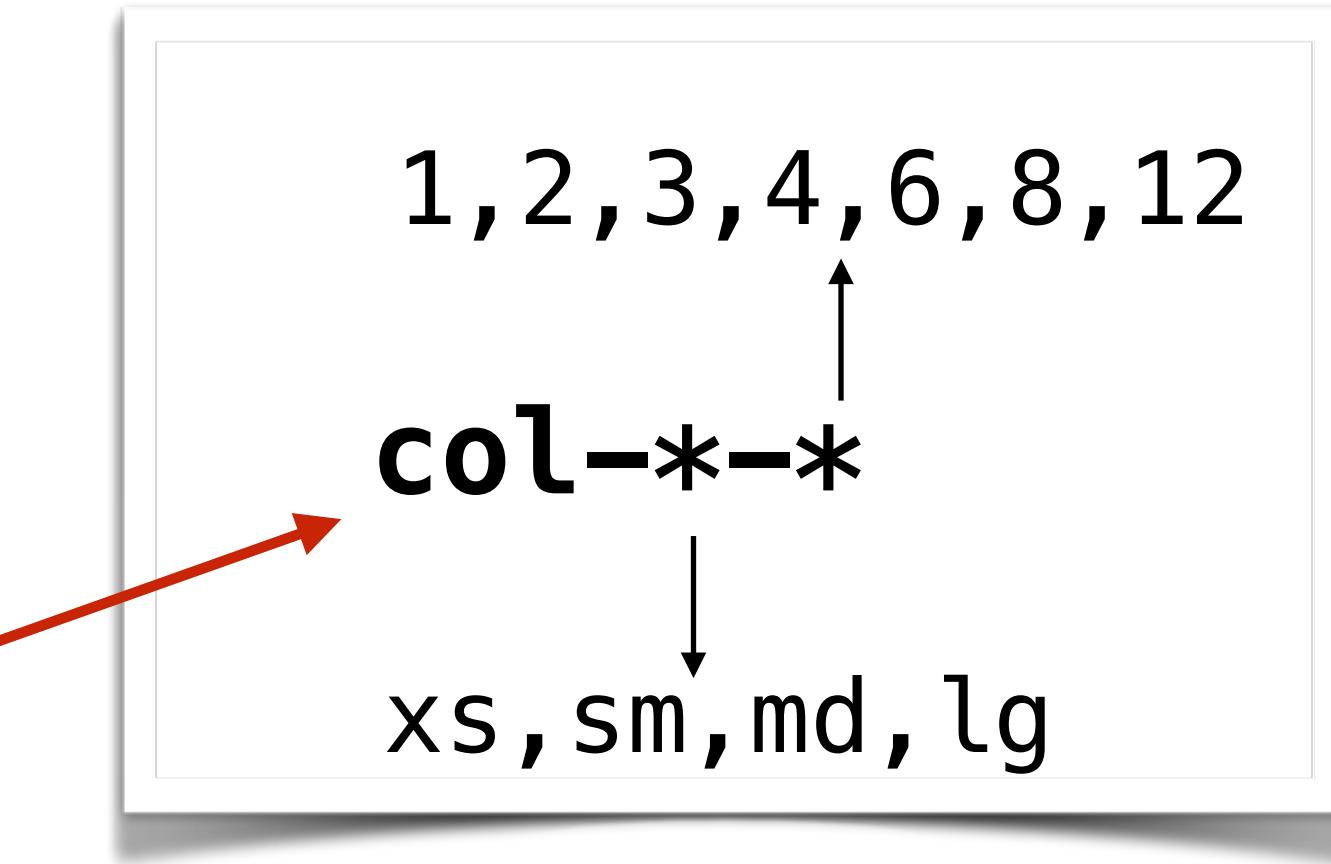
Grid system

- Allows up to 12 columns across the page
- Responsive, i.e., columns re-arrange automatically depending on the screen size
- Four classes
 - **xs** (for phones, <768px)
 - **sm** (for tablets, >=768px)
 - **md** (for desktops, >=992px)
 - **lg** (for large desktops, >=1200px)

Grid system (2)

- Basic structure

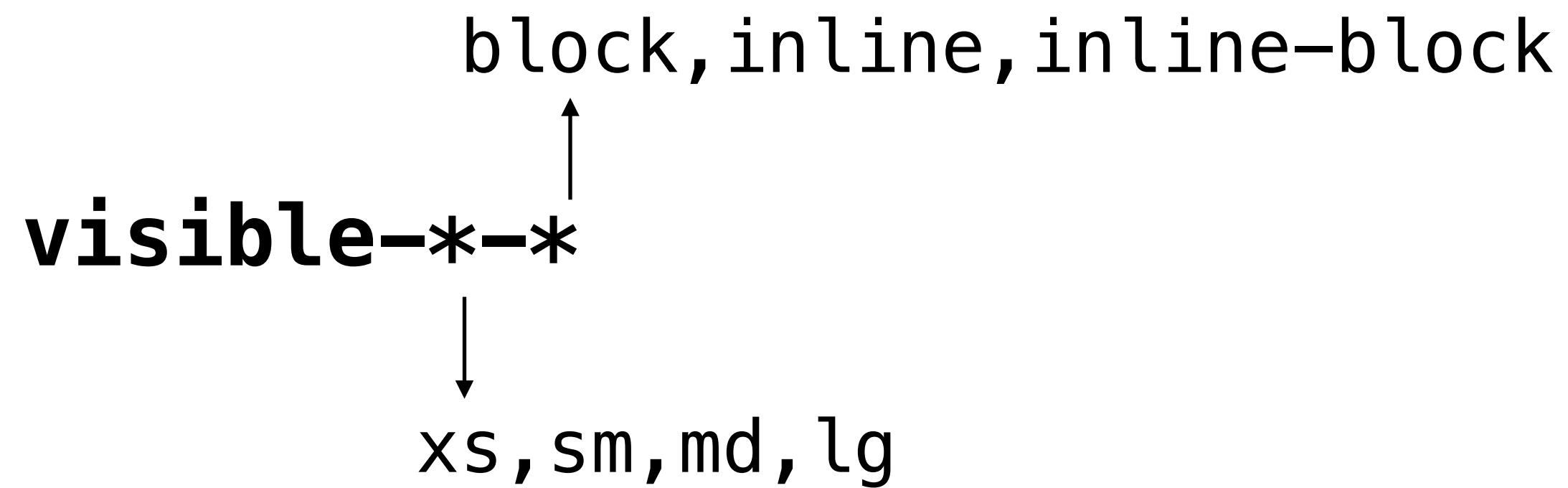
```
<div class="row">
  <div class="col-*-*">...</div>
  <div class="...">...</div>
  <div class="...">...</div>
</div>
<div class="row">
  ...
</div>
```



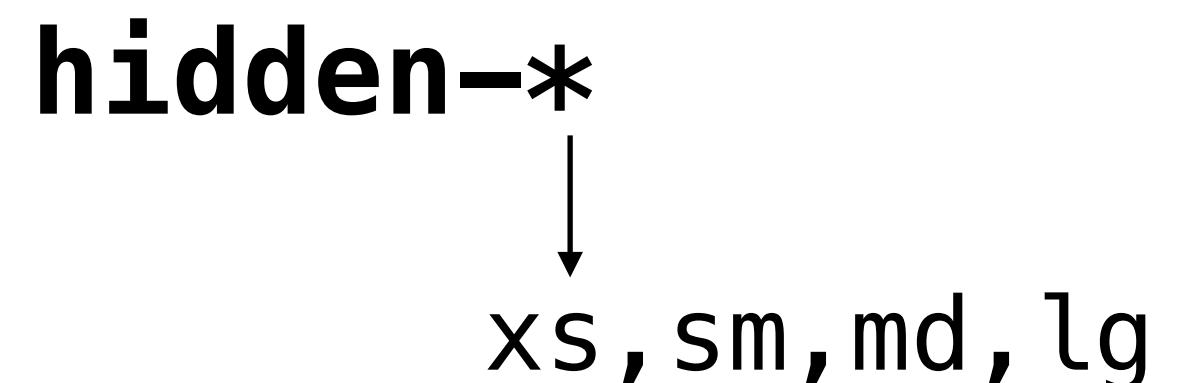
- If more than 12 columns are placed within a single row, they will wrap into a new line

Responsive classes

- Visible only on certain devices



- Hidden on certain devices (visible on all other)



Example (responsive classes)

examples/bootstrap/grid_rc.html

My First Bootstrap Page
Resize this responsive page to see the effect!

Column 1

Column 2

Column 3

My First Bootstrap Page
Resize this responsive page to see the effect!

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

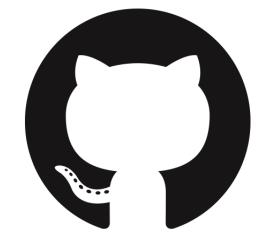
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris...

`<div class="row hidden-xs hidden-sm">`

This block is hidden on extra-small and small devices

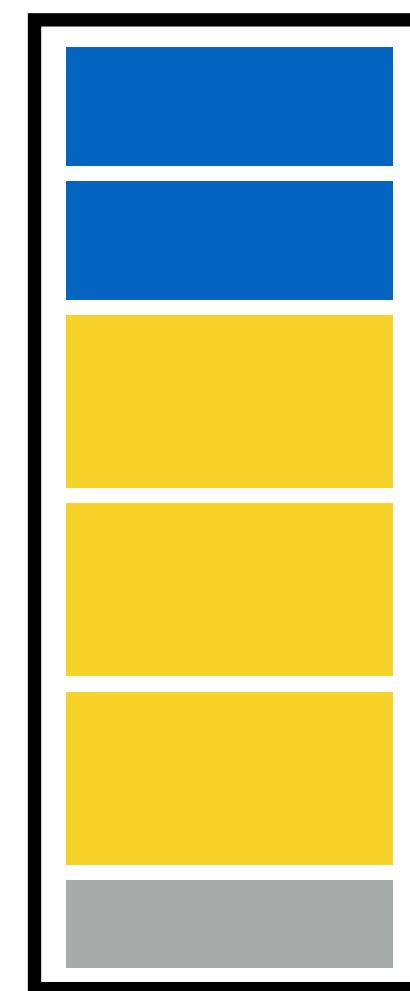
Exercise #2



[https://github.com/kbalog/web-programming/tree/master/
exercises/bootstrap](https://github.com/kbalog/web-programming/tree/master/exercises/bootstrap)

Solution

⌚ solutions/bootstrap/exercise2.html



```
<div class="row">
  <div class="col-xs-12 col-md-6">
    <div class="blue"></div>
  </div>
  <div class="col-xs-12 col-md-6">
    <div class="blue"></div>
  </div>
</div>
```



```
<div class="row hidden-xs hidden-sm">
  <div class="col-md-3">
    <div class="orange"></div>
  </div>
  <div class="col-md-3">
    <div class="orange"></div>
  </div>
  ...
</div>
```

Style definitions for HTML elements

- Basic text
- Tables
- Images
- Buttons
- Forms
- Helpers
- See <http://getbootstrap.com/css/>

Text/Typography

- Elements are styled differently from browser defaults
 - Headings
 - Marks
 - Blockquotes
 - ...
- Contextual classes (for colors and backgrounds)
- See http://www.w3schools.com/bootstrap/bootstrap_typography.asp

Example (text)

examples/bootstrap/text.html

The screenshot shows a web browser window titled "Example: Bootstrap text". The URL in the address bar is "file:///Users/kbalog/work/github/web-programming/examples/bootstrap/bootstrap_text.html". The page content includes:

- h1 heading** secondary text
- h2 heading** secondary text
- h3 heading** secondary text
- h4 heading** secondary text
- h5 heading** secondary text
- h6 heading** secondary text

Highlight Text
Use the `mark` element to highlight text.

Blockquotes
The `blockquote` element is used to present content from another source:
For 50 years, WWF has been protecting the future of nature. The world's leading conservation organization, WWF works in 100 countries and is supported by 1.2 million members in the United States and close to 5 million globally.
— From WWF's website

Code Snippets
Inline snippets of code should be embedded in the `code` element:
The following HTML elements: `span`, `section`, and `div` defines a section in a document.

Contextual Colors
Use the contextual classes to provide "meaning through colors":
This text is muted.
This text is important.
This text indicates success.
This text represents some information.
This text represents a warning.
This text represents danger.

Contextual Backgrounds
Use the contextual background classes to provide "meaning through colors":
This text is important.
This text indicates success.
This text represents some information.
This text represents a warning.
This text represents danger.

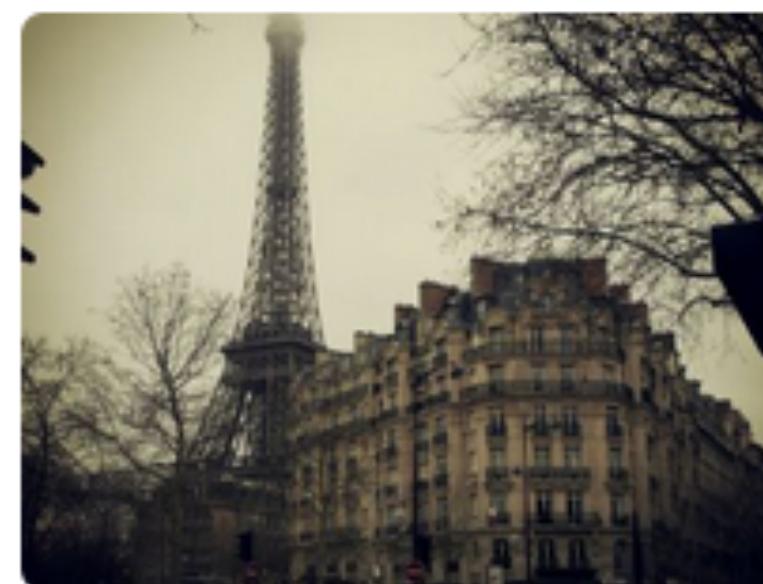
Tables

- **.table** – basic table
- **.table-striped** – adds zebra-stripes
- **.table-bordered** – adds borders (on all sides of the table/cells)
- **.table-hover** – enables a hover state on table rows
- **.table-condensed** – makes a table more compact
- Contextual classes can also be used (e.g., **.active**, **.info**)
- See http://www.w3schools.com/bootstrap/bootstrap_tables.asp

Images

- **.img-rounded** – adds rounded corners to an image
- **.img-circle** – shapes the image to a circle
- **.img-thumbnail** – shapes the image to a thumbnail
- **.img-responsive** – automatically scale img to parent element
- See http://www.w3schools.com/bootstrap/bootstrap_images.asp

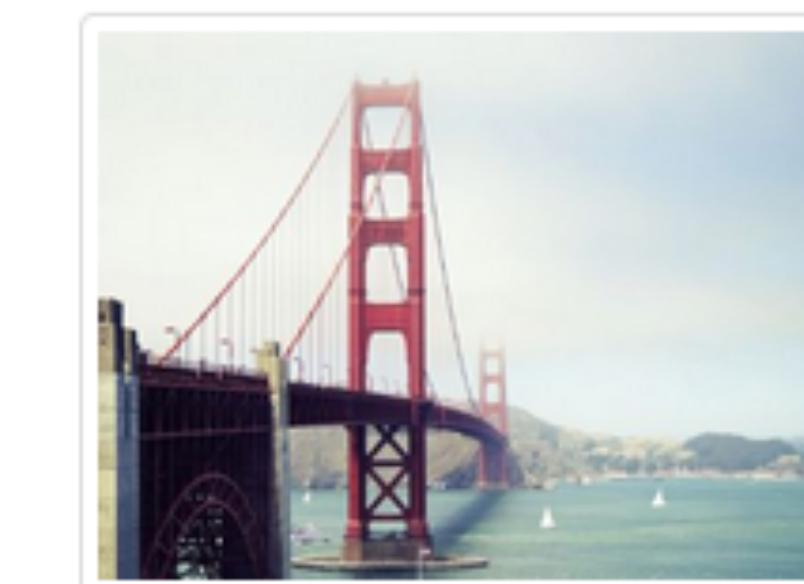
Rounded Corners:



Circle:

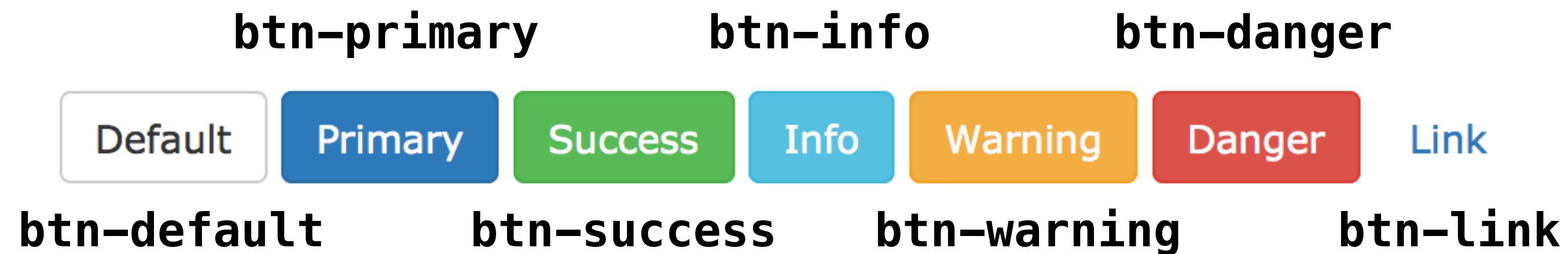


Thumbnail:

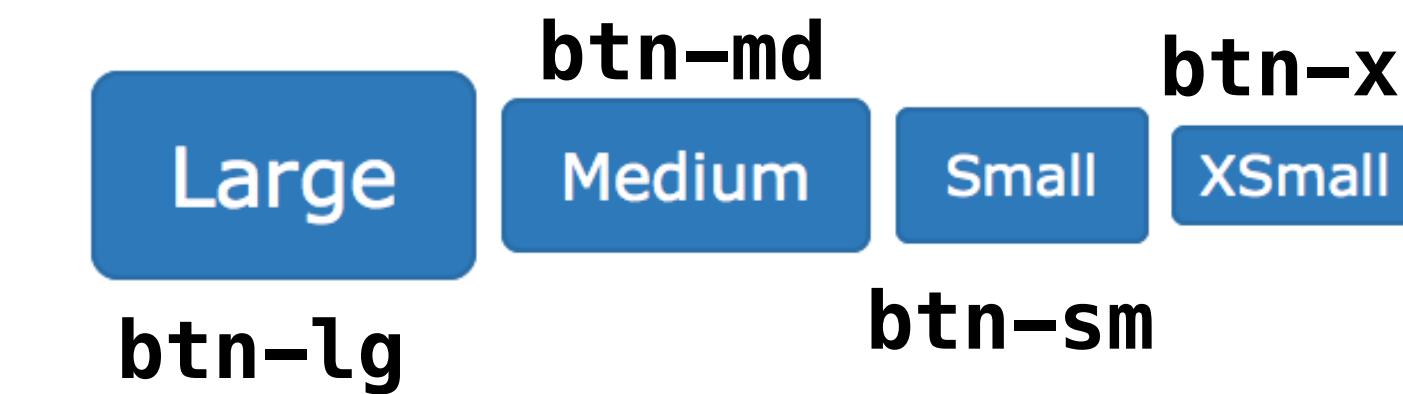


Buttons

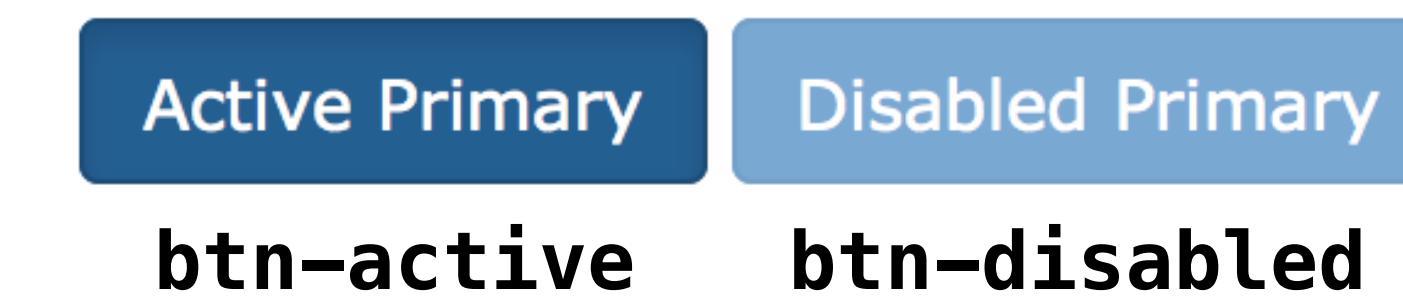
- Styles



- Sizes



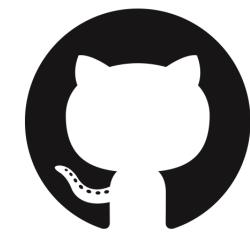
- States



- Button classes can be used on `<a>`, `<button>`, and `<input>` elements. E.g.,

```
<input type="submit" class="btn btn-info btn-md" value="Submit Button">
```

Exercises #3-#5



[https://github.com/kbalog/web-programming/tree/master/
exercises/bootstrap](https://github.com/kbalog/web-programming/tree/master/exercises/bootstrap)

Forms

- Individual form controls
- Inline vs. horizontal forms
- States (focused, disabled, readonly)
- Help text
- Validation states
- See <http://getbootstrap.com/css/#forms>

Forms

```
<form>
  <div class="form-group">
    <label for="email">Email address:</label>
    <input type="email" class="form-control" id="email">
  </div>
  <div class="form-group">
    <label for="pwd">Password:</label>
    <input type="password" class="form-control" id="pwd">
  </div>
  <div class="checkbox">
    <label><input type="checkbox"> Remember me</label>
  </div>
  <button type="submit" class="btn btn-default">Submit</button>
</form>
```

Email address:

Password:

Remember me

Submit

Forms

```
<form>
  <div class="form-group">
    <label for="email">Email address:</label>
    <input type="email" class="form-control" id="email">
  </div>
  <div class="form-group">
    <label for="pwd">Password:</label>
    <input type="password" class="form-control" id="pwd">
  </div>
  <div class="checkbox">
    <label><input type="checkbox" /> Remember me</label>
  </div>
  <button type="submit" class="btn btn-default">Submit</button>
</form>
```

Email address:

Password:

Remember me

Submit

All textual `<input>`, `<textarea>`, and `<select>` elements with `form-control` are set to `width: 100%`.

Forms

```
<form>
  <div class="form-group">
    <label for="email">Email address:</label>
    <input type="text" class="form-control" id="email" placeholder="Email address"/>
    Wrap labels and controls in form-group for optimal spacing.
  </div>
  <div class="form-group">
    <label for="pwd">Password:</label>
    <input type="password" class="form-control" id="pwd" placeholder="Password"/>
  </div>
  <div class="checkbox">
    <label><input type="checkbox" /> Remember me</label>
  </div>
  <button type="submit" class="btn btn-default">Submit</button>
</form>
```

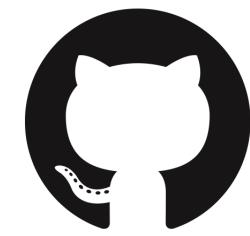
Email address:

Password:

Remember me

Submit

Exercises #6-#7



[https://github.com/kbalog/web-programming/tree/master/
exercises/bootstrap](https://github.com/kbalog/web-programming/tree/master/exercises/bootstrap)

Bootstrap Components

getbootstrap.com/components

Glyphicons

- Over 250 icons in font format
- Can be used with buttons, alerts, form inputs, etc.
- Not to be directly combined with other components. Add a nested `` and apply the icon classes to the ``.

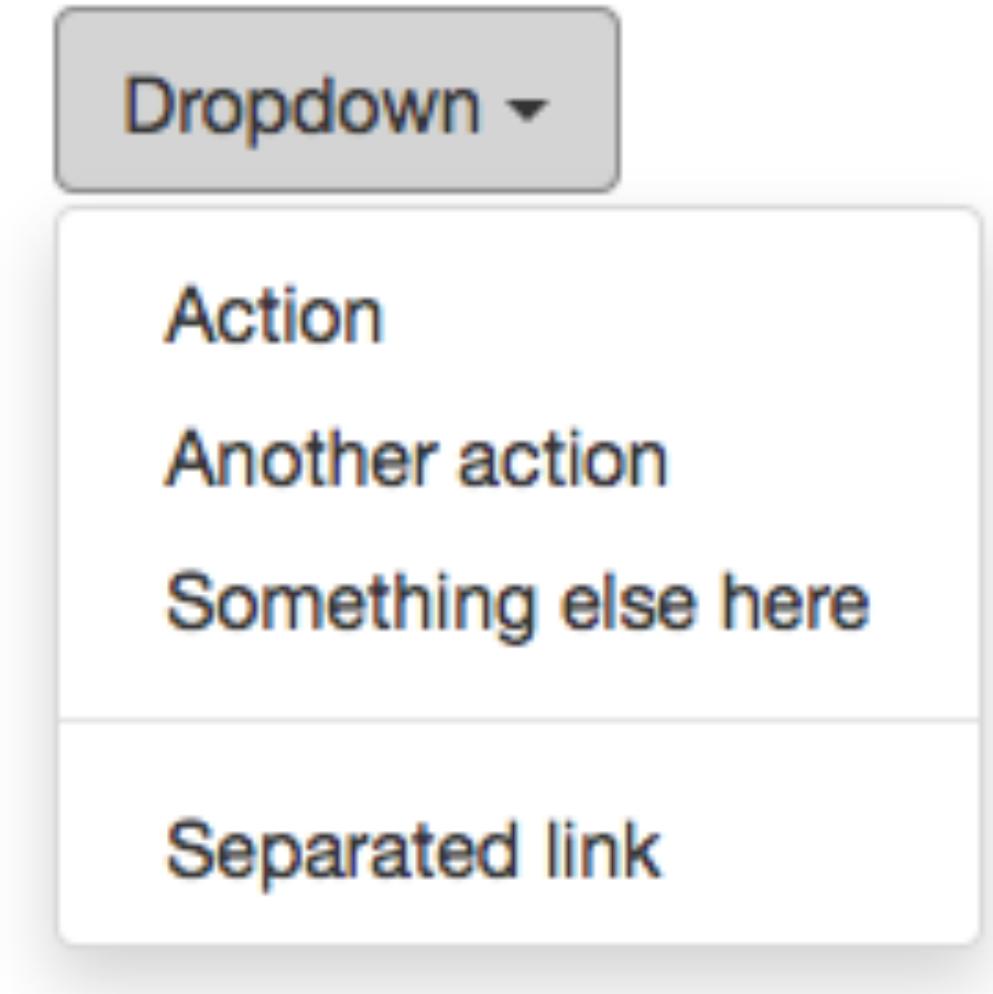
```
<button type="button" class="btn btn-primary btn-lg">
  <span class="glyphicon glyphicon-folder-open" aria-hidden="true"></span>
  Learn more
</button>
```

 Learn more

Dropdowns

- Toggleable, contextual menu for displaying lists of links
 - Made interactive with JavaScript

```
<div class="dropdown">
  <button class="btn btn-default dropdown-toggle"
type="button" id="dropdownMenu1" data-toggle="dropdown" aria-
haspopup="true" aria-expanded="true">
  Dropdown
  <span class="caret"></span>
</button>
<ul class="dropdown-menu" aria-labelledby="dropdownMenu1">
  <li><a href="#">Action</a></li>
  <li><a href="#">Another action</a></li>
  <li><a href="#">Something else here</a></li>
  <li role="separator" class="divider"></li>
  <li><a href="#">Separated link</a></li>
</ul>
</div>
```



Button groups

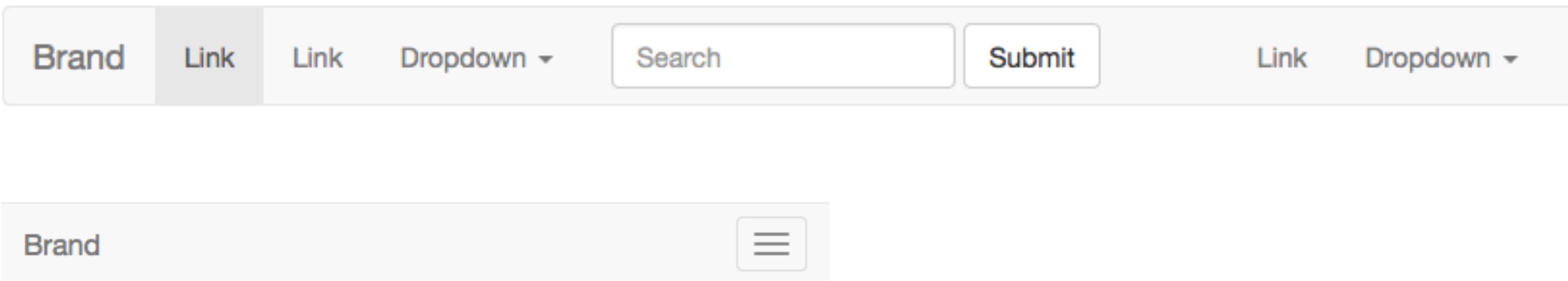
- Group a series of buttons together on a single line

```
<div class="btn-group" role="group" aria-label="...>
  <button type="button" class="btn btn-default">Left</button>
  <button type="button" class="btn btn-default">Middle</button>
  <button type="button" class="btn btn-default">Right</button>
</div>
```



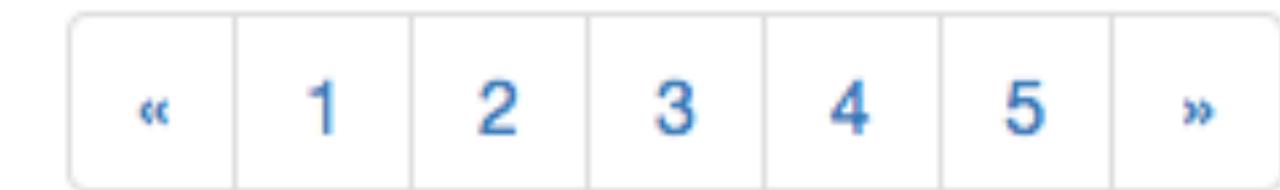
Navbar

- Navigation header for the application or site
 - Collapsed in mobile views and become horizontal as the viewport increases
 - Requires JS



Pagination

- Pagination links (e.g., for search results)



```
<nav>
  <ul class="pagination">
    <li>
      <a href="#" aria-label="Previous">
        <span aria-hidden="true">&laquo;</span>
      </a>
    </li>
    <li><a href="#">1</a></li>
    [...]
    <li><a href="#">5</a></li>
    <li>
      <a href="#" aria-label="Next">
        <span aria-hidden="true">&raquo;</span>
      </a>
    </li>
  </ul>
</nav>
```

Labels

- Labels in rounded boxes
 - Size is adjusted automatically

```
<h3>Example heading <span class="label label-default">New</span></h3>
```

Example heading New

Badges

- For highlighting new or unread items
 - Can be added to links, Bootstrap navs, etc.

```
<a href="#">Inbox <span class="badge">42</span></a>  
  
<button class="btn btn-primary" type="button">  
    Messages <span class="badge">4</span>  
</button>
```

Inbox 42

Messages 4

Jumbotron

- Component that can optionally extend the entire viewport to showcase key content on your site

```
<div class="jumbotron">
  <h1>Hello, world!</h1>
  <p>...</p>
  <p><a class="btn btn-primary btn-lg" href="#" role="button">Learn more</a></p>
</div>
```

Hello, world!

This is a simple hero unit, a simple jumbotron-style component for calling extra attention to featured content or information.

[Learn more](#)

Alerts

- Contextual feedback messages for typical user actions

```
<div class="alert alert-warning" role="alert">
  <strong>Warning!</strong> Better check yourself, you're not looking too good.
</div>
```

Warning! Better check yourself, you're not looking too good.

Dismissible alerts

- Make any alert "closeable"
 - Needs JS

```
<div class="alert alert-warning alert-dismissible" role="alert">
  <button type="button" class="close" data-dismiss="alert" aria-
label="Close"><span aria-hidden="true">&times;</span></button>
  <strong>Warning!</strong> Better check yourself, you're not looking too good.
</div>
```

Warning! Better check yourself, you're not looking too good.



Panels

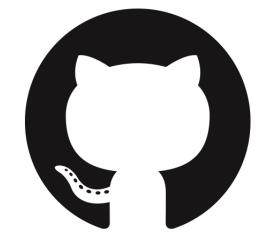
- For "boxing" content

```
<div class="panel panel-default panel-primary">
  <div class="panel-heading">
    <h3 class="panel-title">Panel title</h3>
  </div>
  <div class="panel-body">
    [...]
  </div>
</div>
```

Panel title

Morbi vulputate at nunc at dignissim. Aenean sed quam augue. In hac habitasse platea dictumst. Ut interdum eros ac tincidunt semper. Duis eu nibh tortor. Maecenas ut rhoncus nulla. Morbi a augue accumsan, faucibus risus vitae, lacinia arcu.

Exercise #8



[https://github.com/kbalog/web-programming/tree/master/
exercises/bootstrap](https://github.com/kbalog/web-programming/tree/master/exercises/bootstrap)

Bootstrap Plugins

DataTables

<http://www.datatables.net>

- jQuery Plugin for working with tables
- Pagination, instant search, multi-column ordering
- Can load data from various sources
 - HTML, JavaScript, AJAX
- Theme-able
 - Styles for Bootstrap:
<http://www.datatables.net/manual/styling/bootstrap>

Example

examples/bootstrap/datatables.html

Name	Position	Office	Age	Start date	Salary
Airi Satou	Accountant	Tokyo	33	2008/11/28	\$162,700
Angelica Ramos	Chief Executive Officer (CEO)	London	47	2009/10/09	\$1,200,000
Ashton Cox	Junior Technical Author	San Francisco	66	2009/01/12	\$86,000
Bradley Greer	Software Engineer	London	41	2012/10/13	\$132,000
Brenden Wagner	Software Engineer	San Francisco	28	2011/06/07	\$206,850
Brielle Williamson	Integration Specialist	New York	61	2012/12/02	\$372,000
Bruno Nash	Software Engineer	London	38	2011/05/03	\$163,500
Caesar Vance	Pre-Sales Support	New York	21	2011/12/12	\$106,450
Cara Stevens	Sales Assistant	New York	46	2011/12/06	\$145,600
Cedric Kelly	Senior Javascript Developer	Edinburgh	22	2012/03/29	\$433,060

Name	Position	Office	Age	Start date	Salary
Airi Satou	Accountant	Tokyo	33	2008/11/28	\$162,700

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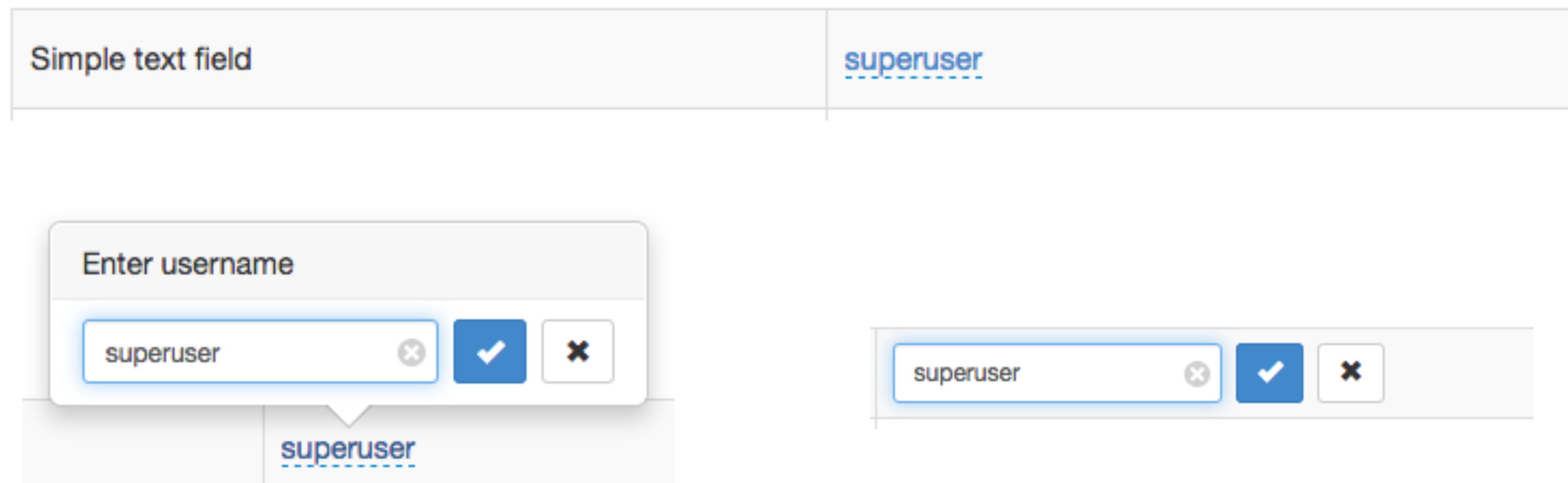
Server-side processing

- Needed if working with large databases
- All paging, searching, ordering operations are handed off to the server (where an SQL engine performs them)
- AJAX is used to get the required data from the server
- Details: <https://datatables.net/manual/server-side>

X-editable

<http://vitalets.github.io/x-editable/>

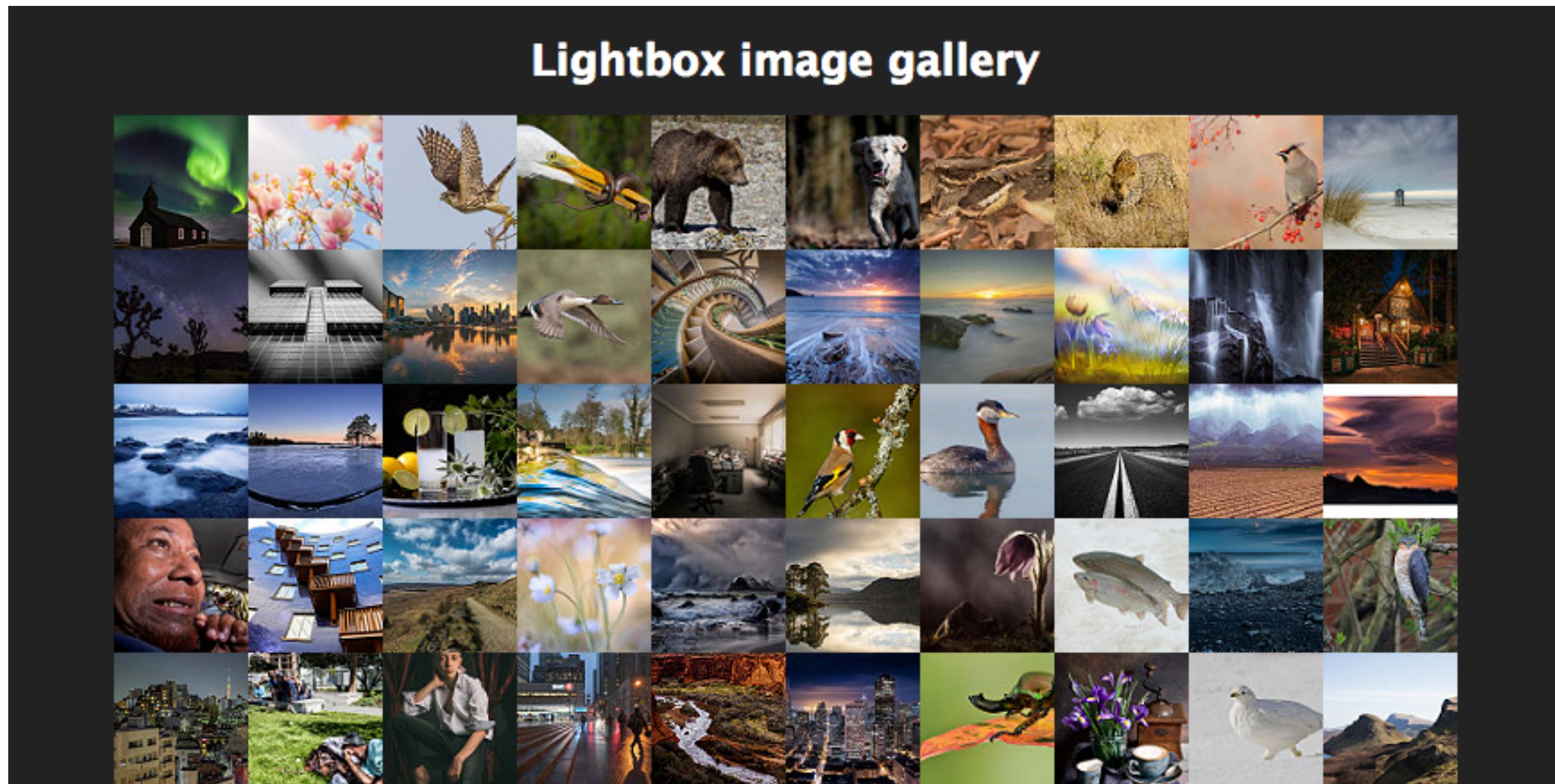
- Create editable elements on the page, both *popup* and *inline*



blueimp Gallery

<https://blueimp.github.io/Gallery/>

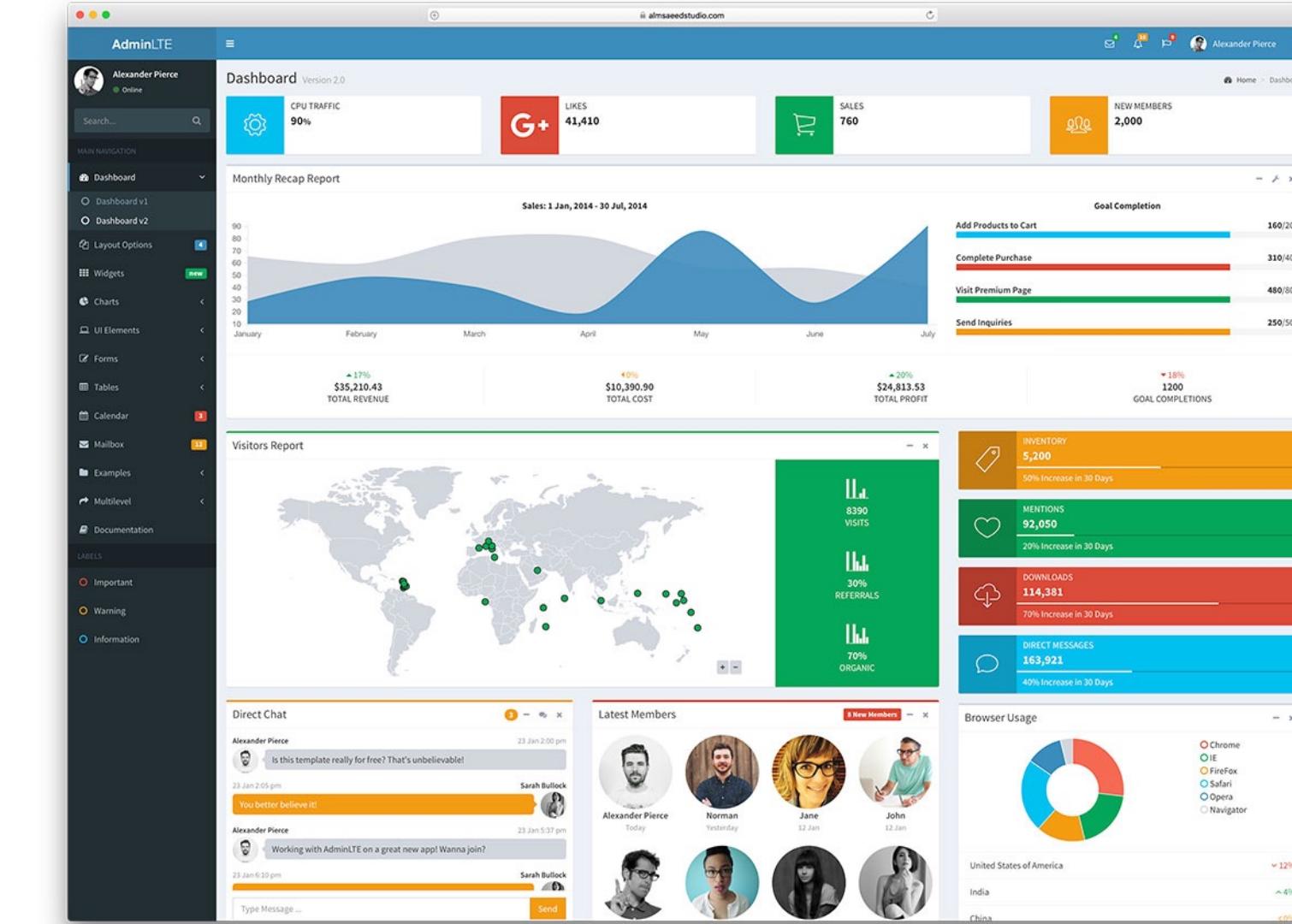
- Touch-enabled, responsive and customizable image and video gallery



Bootstrap Themes

Bootstrap themes and admin dashboards

- Building on the Bootstrap framework
- Both paid and free alternatives



More

- <https://startbootstrap.com/bootstrap-resources/>
- <https://envato.com/blog/addons-plugins-extending-bootstrap/>
- <https://wrapbootstrap.com/themes/admin>
- <https://envato.com/blog/bootstrap-admin-templates/>

References

- Bootstrap
 - <http://getbootstrap.com>
 - <http://www.w3schools.com/bootstrap>
- Lists of CSS boilerplates and frameworks
 - <http://mashable.com/2013/04/26/css-boilerplates-frameworks/>
 - <http://www.awwwards.com/what-are-frameworks-22-best-responsive-css-frameworks-for-web-design.html>