



The illustration features a large computer monitor in the center. On the left, there are logos for HTML5 (a red shield with a white '5') and CSS3 (a blue shield with a white '3'). On the right, there is a yellow logo for JavaScript (a yellow shield with a white 'JS'). Three stylized figures are interacting with the monitor: one is standing on a ladder to the right, another is standing in front of the monitor pointing at it, and a third is standing to the left. The monitor displays a webpage with a search bar labeled 'Q. SEARCH', a checkmark, and some text. The background is light blue with some clouds and gears.

Web Programming

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The illustration shows a close-up of a white teacup with a tea bag on a saucer, placed on a desk. In the background, there is a laptop and some colorful bokeh lights. The text 'Responsive Web Design And Debug' is overlaid on the right side of the image.

Responsive Web Design And Debug

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Contents

01 Responsive web design

02 Bootstrap

03 Web Developer Tools

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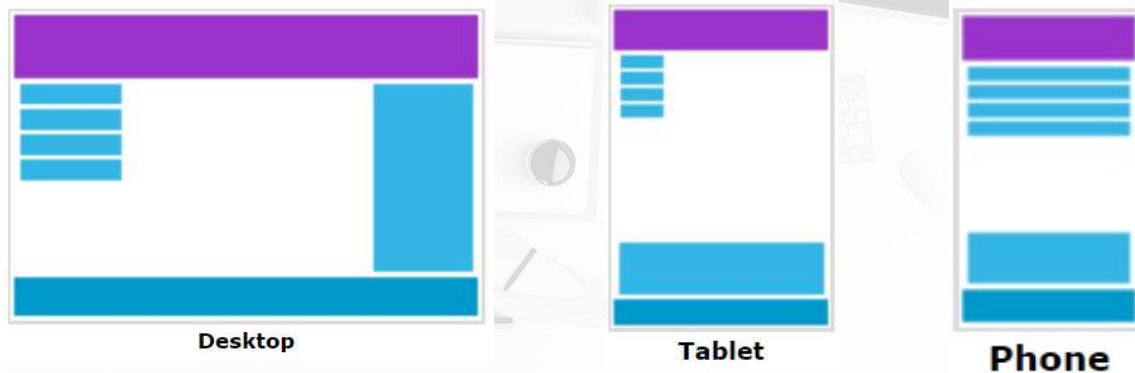


1. Responsive Web Design

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What is Responsive Web Design?

- Responsive web design makes your web page **look good on all devices**
- Responsive web design **uses only HTML and CSS**
(not a program or a JavaScript)



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The Viewport

- The viewport is the **user's visible area** of a web page
Varies with the device, and will be smaller on a cell phone than on a computer screen

- Setting The Viewport

Should include the following **<meta> viewport** element in all web pages

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

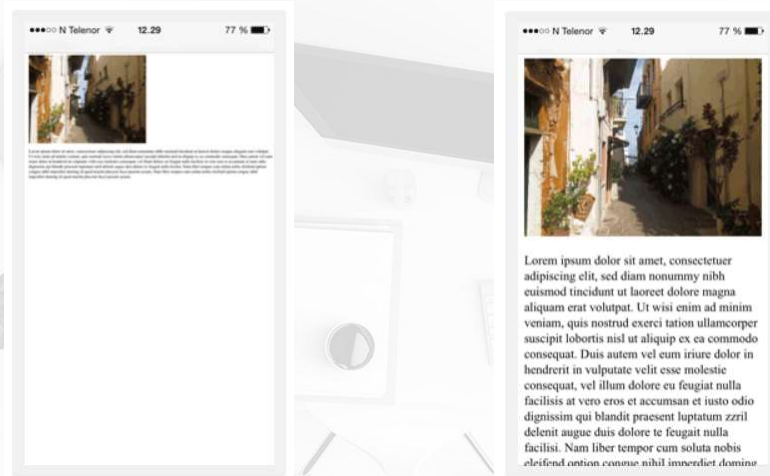
- ✓ **<meta> viewport** element gives the browser instructions on how to control the page's dimensions and scaling
- ✓ The **width=device-width** part sets the width of the page to follow the screen-width of the device
- ✓ The **initial-scale=1.0** part sets the initial zoom level

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The Viewport

Example



Without the viewport meta tag

With the viewport meta tag

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Media Queries

- Media Query uses the **@media** rule to include a block of CSS properties only if a certain condition is true
- Example: If the browser window is 600px or smaller, the background color will be lightblue.

```
@media only screen and (max-width: 600px) {
  body {
    background-color: lightblue;
  }
}
```

Source: https://www.w3schools.com/cssref/css3_pr_mediaquery.asp

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Breakpoint

- Certain parts of the design will behave differently on each side of the breakpoint
- Typical Device Breakpoints

```
/* Extra small devices (phones, 600px and down) */
@media only screen and (max-width: 600px) {...}

/* Small devices (portrait tablets and large phones, 600px and up) */
@media only screen and (min-width: 600px) {...}

/* Medium devices (landscape tablets, 768px and up) */
@media only screen and (min-width: 768px) {...}

/* Large devices (laptops/desktops, 992px and up) */
@media only screen and (min-width: 992px) {...}

/* Extra large devices (large laptops and desktops, 1200px and up) */
@media only screen and (min-width: 1200px) {...}
```

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Responsive Web Design

Images

- Using The **max-width** Property
If the max-width property is set to 100%, the image will scale down if it has to, but never scale up to be larger than its original size

- Different Images for Different Devices

```
<picture>
  <source srcset="img_smallflower.jpg" media="(max-width: 400px)">
  <source srcset="img_flowers.jpg">
  
</picture>
```

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Bootstrap

- Build **responsive**, mobile-first projects on the web
- Be an open-source toolkit for developing with HTML, CSS, and JS:
 - responsive **grid system**,
 - extensive **prebuilt components**,
 - and **powerful plugins** built on jQuery

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Bootstrap Starter template and BootstrapCDN

```

<!doctype html>
<html lang="en">
  <head>
    <title>Bootstrap</title>

    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

    <!-- Bootstrap CSS -->
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/css/
bootstrap.min.css" >

  </head>

  <body>
    <!-- Code HTML -->

    <!-- Optional JavaScript -->
    <!-- jQuery first, then Popper.js, then Bootstrap JS -->
    <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" ></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js" ></script>
    <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js" ></script>
  </body>
</html>

```

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Download and Precompiled Bootstrap



```

bootstrap/
├── css/
│   ├── bootstrap-grid.css
│   ├── bootstrap-grid.css.map
│   ├── bootstrap-grid.min.css
│   ├── bootstrap-grid.min.css.map
│   ├── bootstrap-reboot.css
│   ├── bootstrap-reboot.css.map
│   ├── bootstrap-reboot.min.css
│   ├── bootstrap-reboot.min.css.map
│   ├── bootstrap.css
│   ├── bootstrap.css.map
│   ├── bootstrap.min.css
│   └── bootstrap.min.css.map
└── js/
    ├── bootstrap.bundle.js
    ├── bootstrap.bundle.js.map
    ├── bootstrap.bundle.min.js
    ├── bootstrap.bundle.min.js.map
    ├── bootstrap.js
    ├── bootstrap.js.map
    ├── bootstrap.min.js
    └── bootstrap.min.js.map

```

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CSS files

CSS files	Layout	Content	Components	Utilities
bootstrap.css bootstrap.min.css	Included	Included	Included	Included
bootstrap-grid.css bootstrap-grid.min.css	Only grid system	Not included	Not included	Only flex utilities
bootstrap-reboot.css bootstrap-reboot.min.css	Not included	Only Reboot	Not included	Not included

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JS files

JS files	Popper	jQuery
bootstrap.bundle.js bootstrap.bundle.min.js	Included	Not included
bootstrap.js bootstrap.min.js	Not included	Not included

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Components and Utilities

Link:

- <https://getbootstrap.com/docs/4.4/components/alerts/>
- <https://getbootstrap.com/docs/4.4/utilities/borders/>

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Containers

- Are **required** when using the default grid system
- Fixed-width container (which sets a **max-width** at each responsive breakpoint)

```
<div class = "container">
  <!-- Content here -->
</div>
```

- Fluid-width (which is **width: 100%** at all breakpoints)

```
<div class = "container-fluid">
  <!-- Content here -->
</div>
```

https://www.w3schools.com/bootstrap4/tryit.asp?filename=trybs_gs_container2&stacked=h
https://www.w3schools.com/bootstrap4/tryit.asp?filename=trybs_gs_container-fluid&stacked=h

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Containers

	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	Extra large ≥1200px
<code>.container</code>	100%	540px	720px	960px	1140px
<code>.container-sm</code>	100%	540px	720px	960px	1140px
<code>.container-md</code>	100%	100%	720px	960px	1140px
<code>.container-lg</code>	100%	100%	100%	960px	1140px
<code>.container-xl</code>	100%	100%	100%	100%	1140px
<code>.container-fluid</code>	100%	100%	100%	100%	100%

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Responsive breakpoints

```
// Extra small devices (portrait phones, less than 576px)
// No media query for `xs` since this is the default in Bootstrap

// Small devices (landscape phones, 576px and up)
@media (min-width: 576px) { ... }

// Medium devices (tablets, 768px and up)
@media (min-width: 768px) { ... }

// Large devices (desktops, 992px and up)
@media (min-width: 992px) { ... }

// Extra large devices (large desktops, 1200px and up)
@media (min-width: 1200px) { ... }
```

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Grid options

- A **twelve-column** system, five default responsive tiers
- Uses a series of **containers**, **rows**, and **columns** to layout and align content

	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	Extra large ≥1200px
Max container width	None (auto)	540px	720px	960px	1140px
Class prefix	.col-	.col-sm-	.col-md-	.col-lg-	.col-xl-
# of columns	12				
Gutter width	30px (15px on each side of a column)				

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Grid options

col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1	col-md-1
.col-md-8								.col-md-4			
.col-md-4				.col-md-4				.col-md-4			
.col-md-6						.col-md-6					

❑ `<div class="row">`

❌ `<div class="col-md-4">.col-md-4</div>`

❌ `<div class="col-md-4">.col-md-4</div>`

❌ `<div class="col-md-4">.col-md-4</div>`

❑ `</div>`

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Grid options

```

<div class="row">
  <div class="col-md-4">.col-md-4</div>
  <div class="col-md-4 col-md-offset-4">.col-md-4 .col-md-offset-4</div>
</div>
<div class="row">
  <div class="col-md-3 col-md-offset-3">.col-md-3 .col-md-offset-3</div>
  <div class="col-md-3 col-md-offset-3">.col-md-3 .col-md-offset-3</div>
</div>
<div class="row">
  <div class="col-md-6 col-md-offset-3">.col-md-6 .col-md-offset-3</div>
</div>

```



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Grid options

```

<div class="row">
  <div class="col-md-9">
    Level 1: .col-md-9
    <div class="row">
      <div class="col-md-6">
        Level 2: .col-md-6
      </div>
      <div class="col-md-6">
        Level 2: .col-md-6
      </div>
    </div>
  </div>
</div>

```



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Grid options

```
<div class="container">
  <div class="row">
    <div class="col-12 col-sm-8">Col 1</div>
    <div class="col-12 col-sm-4">Col 2</div>
  </div>
</div>
```

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Form

Form

```
<div class="form-group">
  <label for="email">Email address</label>
  <input type="email" class="form-control">
</div>
```

Email address

Password

File input

Không có tệp nào được chọn

Example block-level help text here.

☐ Check me out

```
<div class="checkbox">
  <label> <input type="checkbox"> Check me out </label>
</div>
```

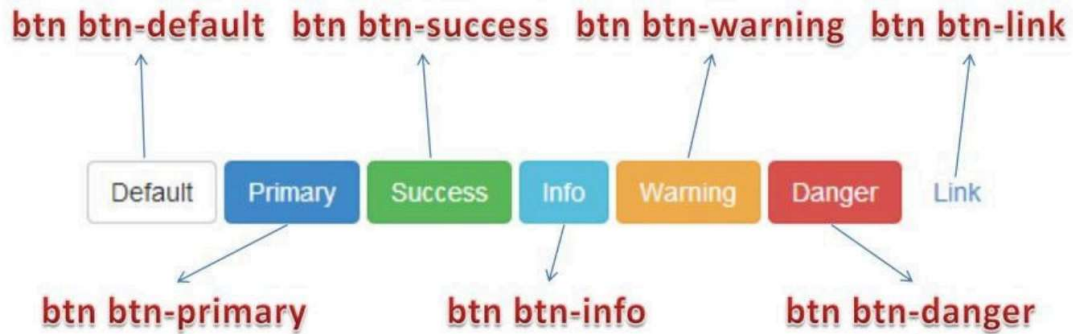
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Form

Button

`<button class="btn btn-default">Default</button>`



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Table

Table

#	First Name	Last Name	Username
1	Mark	Otto	@mdo
2	Jacob	Thornton	@fat
3	Larry the Bird		@twitter

☐ `<table class="table table-hover">...</table>`

☐ Class

- ☒ `table table-bordered:`
- ☒ `table table-striped:`
- ☒ `table table-condensed:`
- ☒ `table table-hover:`

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ICON

Icons

`<span class="glyphicon glyphicon-
asterisk">`



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BUTTON DROPDOWN

Button Dropdown

```

<div class="btn-group">
  <button type="button" class="btn btn-default  
dropdown-toggle" data-toggle="dropdown"> Action
    <span class="caret"></span> </button>
  <ul class="dropdown-menu" role="menu">
    <li><a href="#">Action</a></li>
    <li><a href="#">Another action</a></li>
    <li><a href="#">Something else here</a></li>
    <li class="divider"></li>
    <li><a href="#">Separated link</a></li>
  </ul>
</div>

```



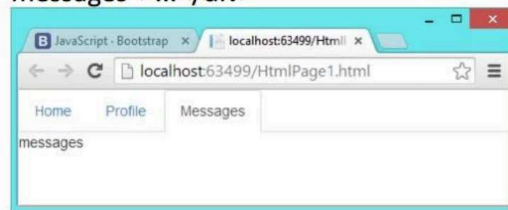
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TAB

Tab

- ❑ `<ul class="nav nav-tabs" role="tablist">`
 - ❌ `<li class="active">Home`
 - ❌ `Profile`
 - ❌ `Messages`
- ❑ ``
- ❑ `<div class="tab-content">`
 - ❌ `<div class="tab-pane active" id="home">...</div>`
 - ❌ `<div class="tab-pane" id="profile">...</div>`
 - ❌ `<div class="tab-pane" id="messages">...</div>`
- ❑ `</div>`



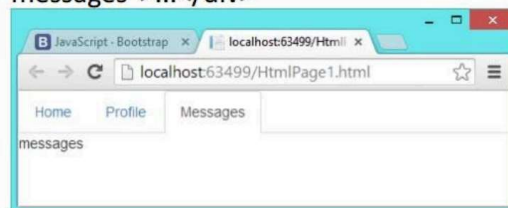
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TAB

Tab

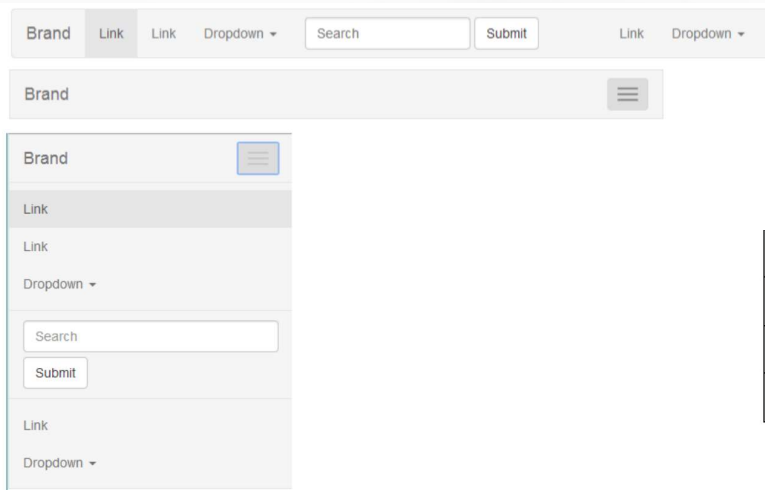
- ❑ `<ul class="nav nav-tabs" role="tablist">`
 - ❌ `<li class="active">Home`
 - ❌ `Profile`
 - ❌ `Messages`
- ❑ ``
- ❑ `<div class="tab-content">`
 - ❌ `<div class="tab-pane active" id="home">...</div>`
 - ❌ `<div class="tab-pane" id="profile">...</div>`
 - ❌ `<div class="tab-pane" id="messages">...</div>`
- ❑ `</div>`



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NAVBAR



1	<code><nav></code>	<code>.navbar</code>
2	<code></code>	<code>.navbar-nav</code>
3	<code></code>	<code>.nav-item</code>
4	<code><a></code>	<code>.nav-link</code>

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NAVBAR

```

<nav class="navbar">
  <ul class="navbar-nav">
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 1</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 2</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 3</a>
    </li>
  </ul>
</nav>

```



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NAVBAR

`.navbar-expand{-sm|-md|-lg|-xl}` for responsive collapsing and [color scheme](#) classes.

```
<nav class="navbar navbar-expand-sm">
  <ul class="navbar-nav">
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 1</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 2</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">Trang 3</a>
    </li>
  </ul>
</nav>
```

Trang 1 Trang 2 Trang 3

Trang 1
Trang 2
Trang 3

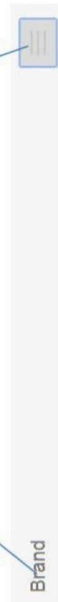
<576px

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NAVBAR

```
<nav class="navbar navbar-default" role="navigation">
  <div class="container-fluid">
    <!-- Tên doanh nghiệp và nút mở rộng -->
    <div class="navbar-header">
      <button type="button" class="navbar-toggle"
        data-toggle="collapse" data-target="#bs-abc">
        <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="#">Brand</a>
    </div>
    <!-- Thanh menu -->
    <div class="collapse navbar-collapse" id="bs-abc">
      <ul class="nav navbar-nav">...</ul>
      <form class="navbar-form navbar-left">...</form>
      <ul class="nav navbar-nav navbar-right">...</ul>
    </div>
  </div>
</nav>
```



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LISTGROUP

Cras justo odio
Dapibus ac facilisis in
Morbi leo risus
Porta ac consectetur ac
Vestibulum at eros

```
<div class="list-group">
  <a href="#" class="list-group-item active"> Cras justo odio </a>
  <a href="#" class="list-group-item">Dapibus ac facilisis in</a>
  <a href="#" class="list-group-item">Morbi leo risus</a>
  <a href="#" class="list-group-item">Porta ac consectetur ac</a>
  <a href="#" class="list-group-item">Vestibulum at eros</a>
</div>
```

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PANEL

Panel title
Panel content

```
<div class="panel panel-default">
  <div class="panel-heading">Panel heading
without title</div>
  <div class="panel-body">
    Panel content
  </div>
</div>

<div class="panel panel-default">
  <div class="panel-heading">
    <h3 class="panel-title">Panel title</h3>
  </div>
  <div class="panel-body">
    Panel content
  </div>
</div>
```

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PANEL

Panel title

Panel content

```
<div class="panel panel-default">
  <div class="panel-heading">Panel heading
without title</div>
  <div class="panel-body">
    Panel content
  </div>
</div>

<div class="panel panel-default">
  <div class="panel-heading">
    <h3 class="panel-title">Panel title</h3>
  </div>
  <div class="panel-body">
    Panel content
  </div>
</div>
```

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EXAMPLE

Header

[Home](#) [About](#) [Contact](#)

Aside

This is the aside content.

Main Content

This is the main content.

Footer

Header

[Home](#) [About](#) [Contact](#)

Aside

This is the aside content.

Main Content

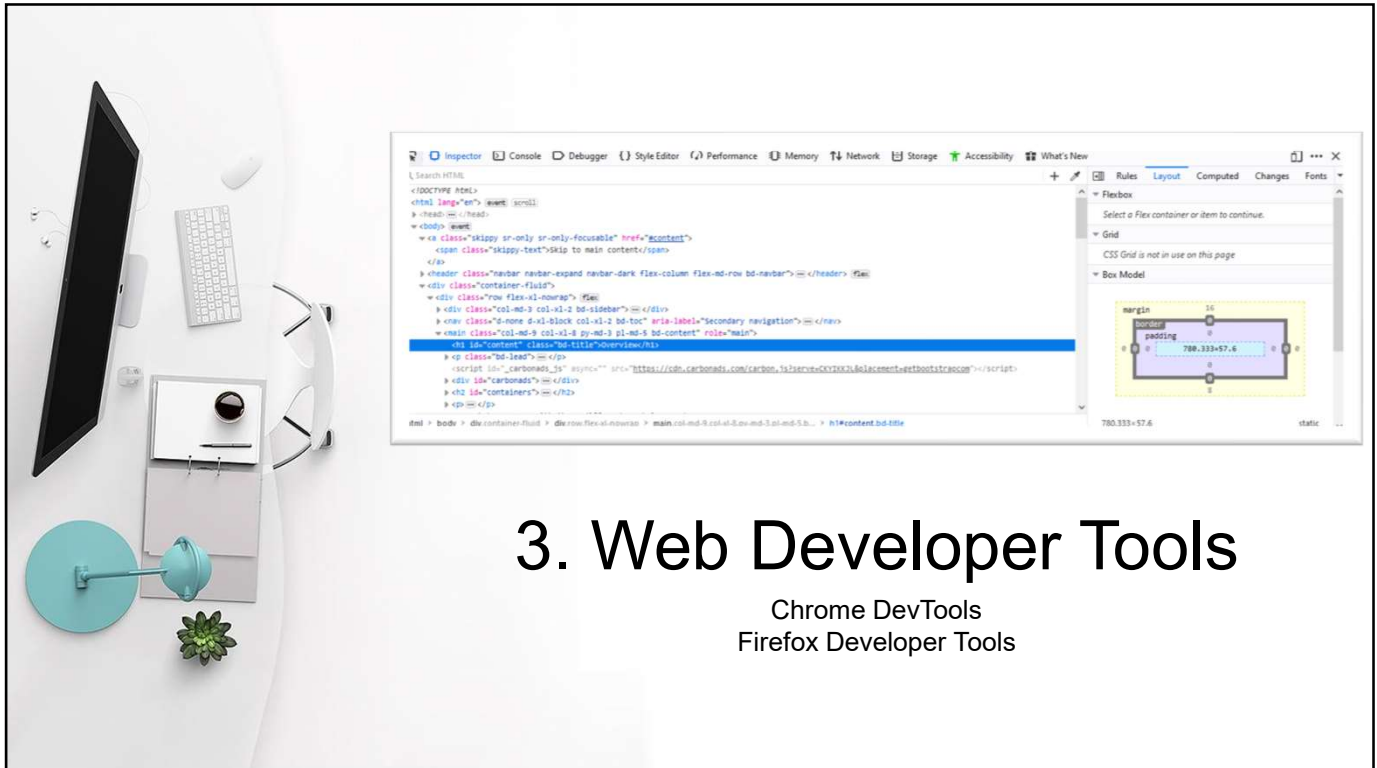
This is the main content.

Footer

<https://codepen.io/Vn-T-i-the-styleful/pen/QWYvMvq?editors=1000>

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3. Web Developer Tools

Chrome DevTools
Firefox Developer Tools

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Web Developer Tools

- A set of web developer tools built into browsers
 - Firefox Developer Tools
 - Chrome DevTools
- Can help you edit pages on-the-fly and **diagnose problems quickly**
 - debugging CSS,
 - prototyping CSS,
 - debugging JavaScript,
 - and analyzing load performance
 - ...

<https://developers.google.com/web/tools/chrome-devtools>

<https://developer.mozilla.org/en-US/docs/Tools>

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How to open

There are three ways to open:

- Keyboard:
 - Ctrl + Shift + I
 - F12
- Menu bar
- Context menu

Right-click an item on a webpage, and choose **Inspect Element** from the context menu

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Web Developer Tools



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The Core Tools

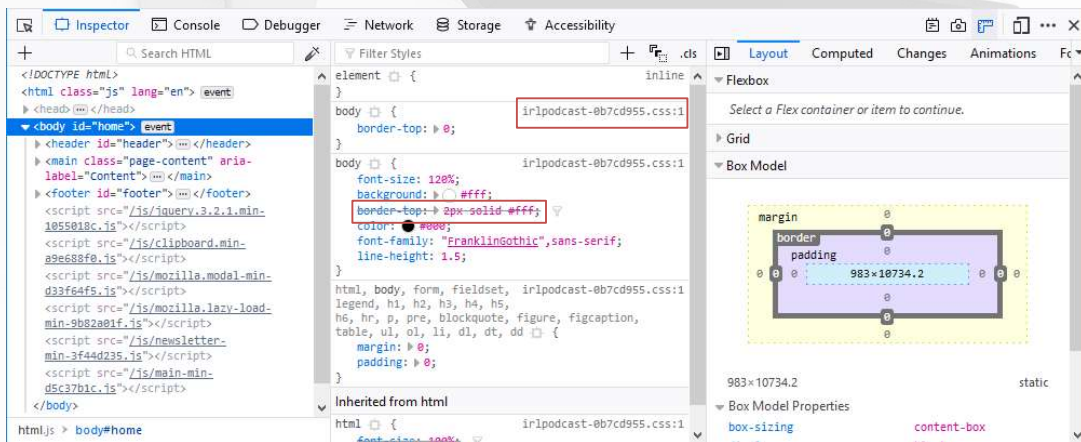
- Page element
- Web console
- JavaScript Debugger
- Performance Tools
- Responsive Design Mode
- Accessibility inspector

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Page Element

- View and edit page content and layout
- Visualize many aspects of the page including the box model, animations, and grid layouts

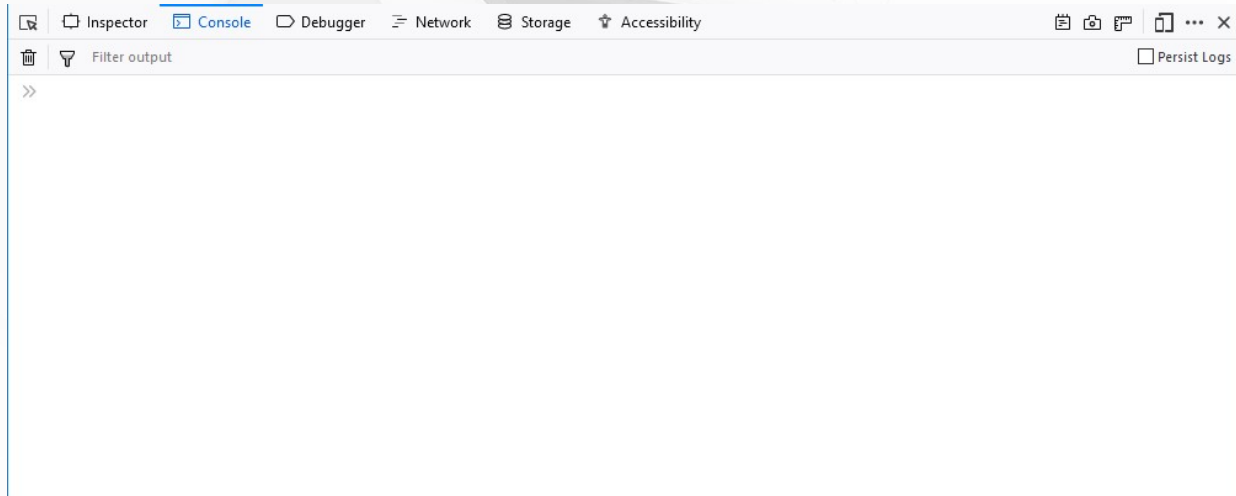


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Web Console

See messages logged by a web page and **interact** with the page **using JavaScript**

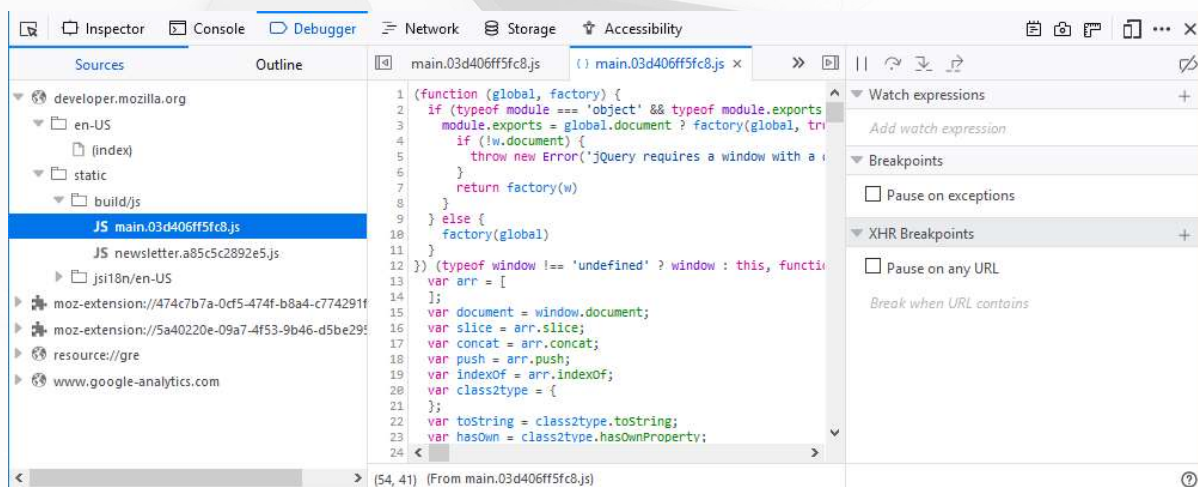


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JavaScript Debugger

Stop, step through, examine, and modify the JavaScript running in a page



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Network Monitor

See the network requests made when a page is loaded

Status	Method	Domain	File	Cause	Type	Transferred	Size	Time
302	GET	developer.mozilla.org	/	document	html	14.19 KB	54.48 KB	172 ms
200	GET	developer.mozilla.org	/en-US/	document	html	14.39 KB	54.48 KB	15 ms
200	GET	developer.mozilla.org	mdn.c89321bb...	stylesheet	css	14.69 KB	80.16 KB	0 ms
200	GET	developer.mozilla.org	home.6909465c...	stylesheet	css	5.17 KB	12.33 KB	0 ms
200	GET	developer.mozilla.org	locale-en-US.5...	stylesheet	css	524 B	524 B	0 ms
200	GET	developer.mozilla.org	javascript.414b...	script	js	cached	0 B	0 ms
200	GET	developer.mozilla.org	main.03d406ff5...	script	js	cached	0 B	0 ms
200	GET	developer.mozilla.org	newsletter.a85...	script	js	cached	0 B	0 ms
200	GET	developer.mozilla.org	favicon144.e7e...	img	png	1.30 KB	1.30 KB	0 ms
200	GET	developer.mozilla.org	favicon32.7f3d...	img	png	441 B	441 B	0 ms
200	GET	www.google-an...	analytics.js	script	js	cached	0 B	0 ms

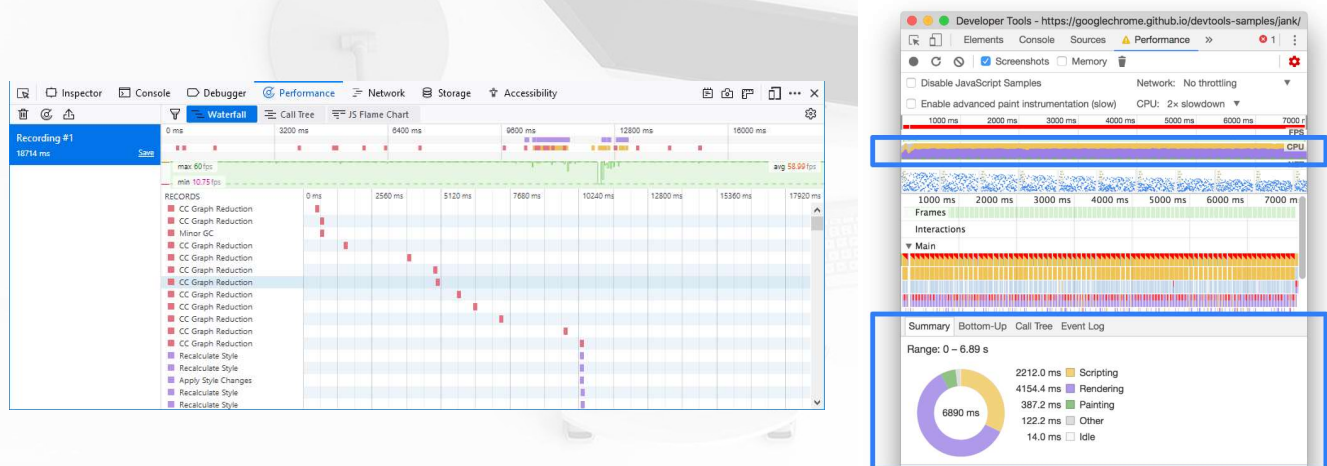
15 requests 203.82 KB / 52.44 KB transferred Finish: 4.99 s DOMContentLoaded: 367 ms load: 482 ms

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Performance Tools

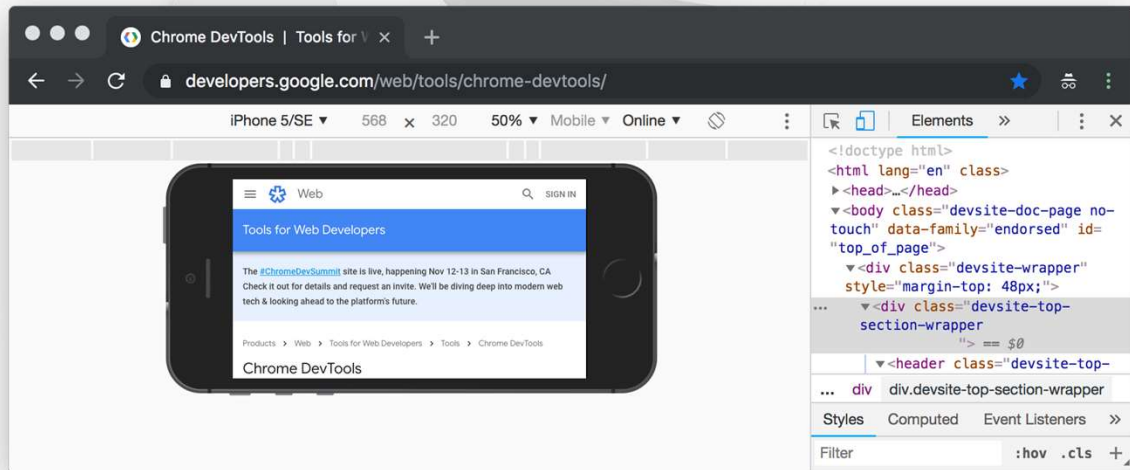
Analyze your site's general responsiveness, JavaScript, and layout performance



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Responsive Design Mode

See how your website or app will look and behave on different devices and network types



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Storage Inspector

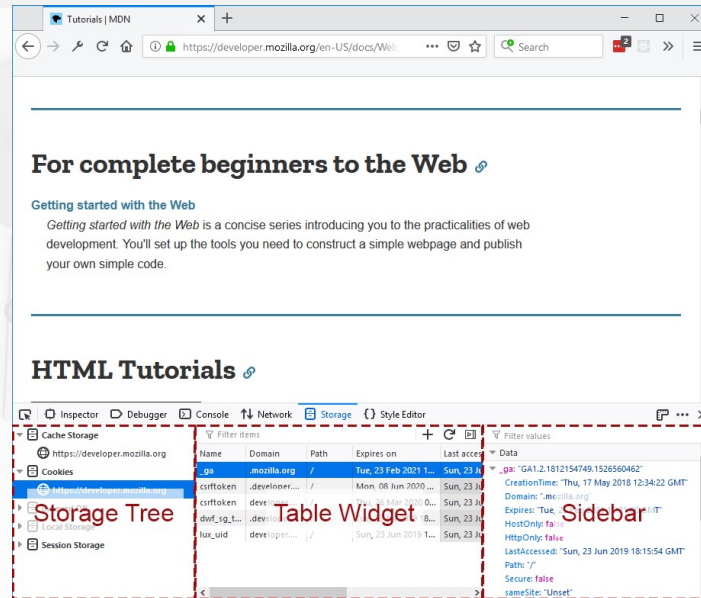
Enables you to inspect various types of storage that a web page can use:

- **Cache Storage** — any DOM caches created using the Cache API
- **Cookies** — All the cookies created by the page or any iframes inside of the page.
Cookies created as a part of response of network calls are also listed
- **Session Storage** — All session storage items created by the page or any iframes inside the page
- **IndexedDB**
- **Local Storage**

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Storage Inspector

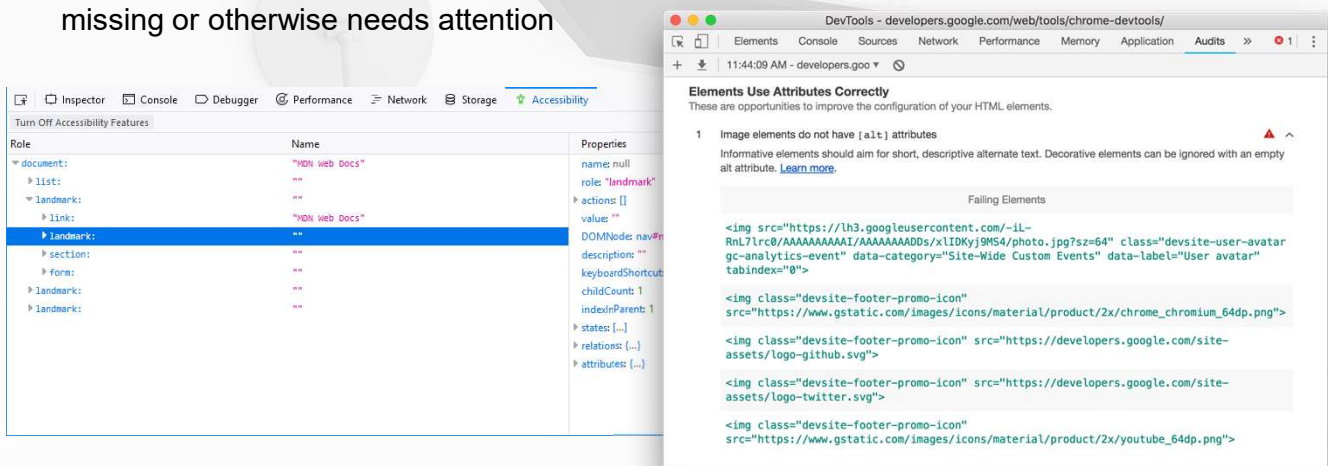


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Accessibility inspector

Provides a means to access the page's accessibility tree, allowing you to check what's missing or otherwise needs attention



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Reference

- **CSS Tutorial**, <https://www.w3schools.com/css/default.asp>
- **Firefox Developer Tools**, <https://developer.mozilla.org/en-US/docs/Tools>
- **Chrome DevTools**, <https://developers.google.com/web/tools/chrome-devtools>

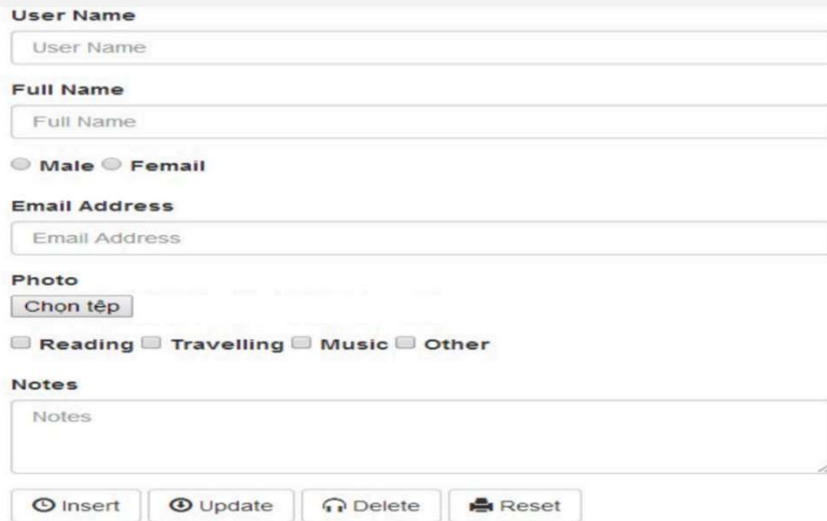
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Summary

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EXERCISE



User Name

Full Name

☐ Male ☐ Female

Email Address

Photo

☐ Reading ☐ Travelling ☐ Music ☐ Other

Notes

See more about bootstrap components at: <https://getbootstrap.com/docs/4.6/components/>

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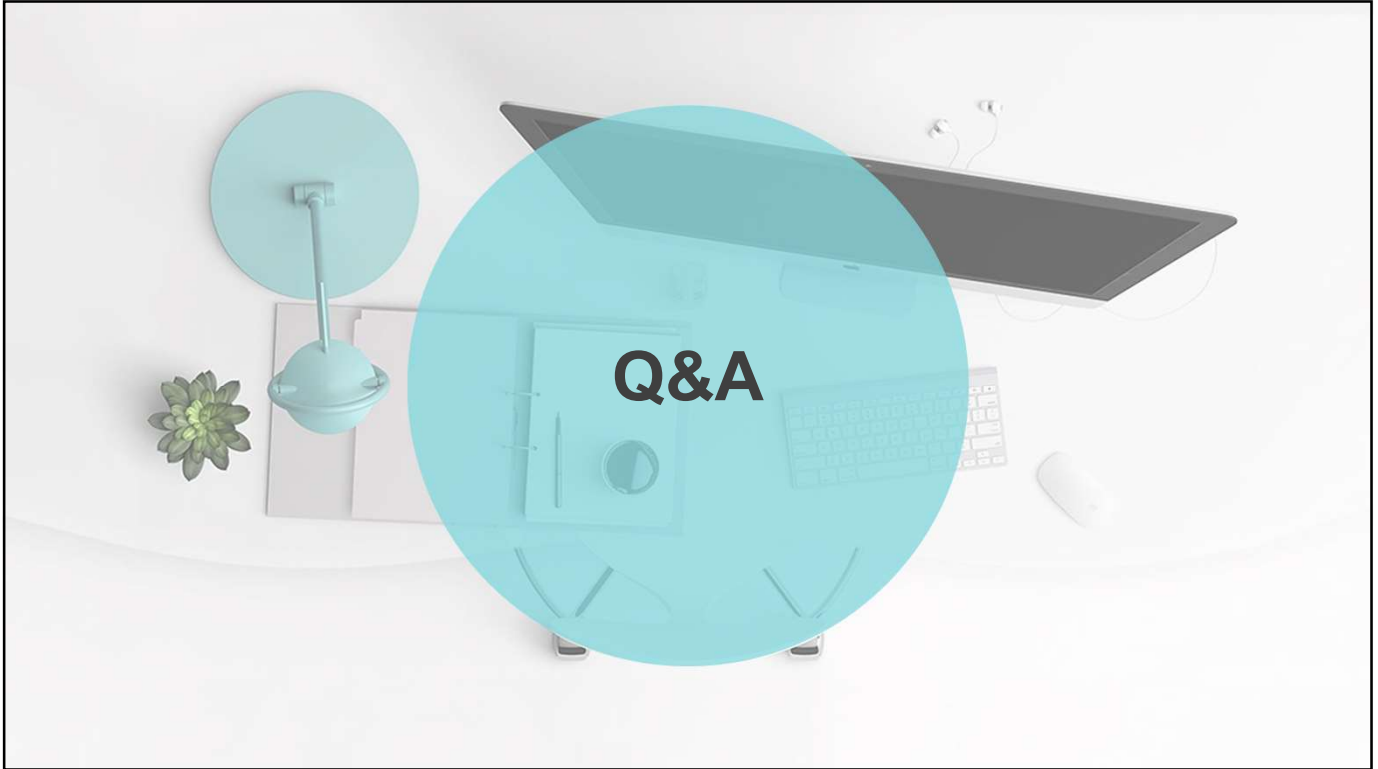
Exercise

Apply Bootstrap to design layout for Lani & Dani webpage (mobile UI).



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