Front-end Development

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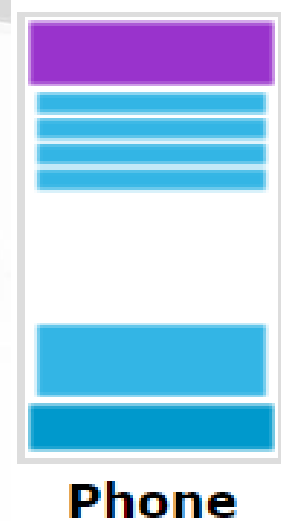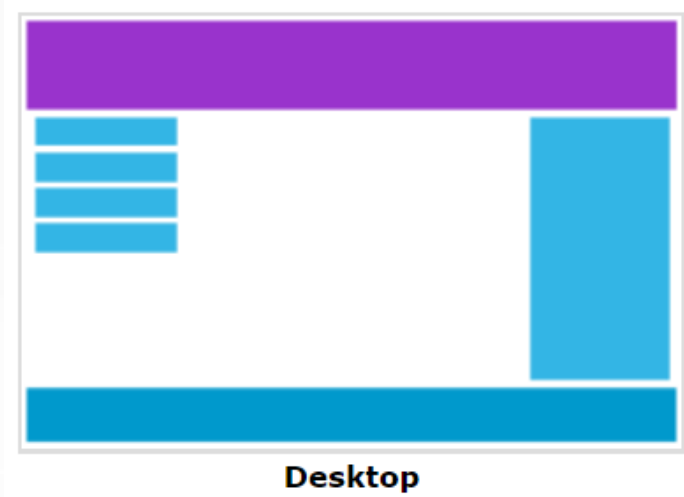# Responsive Web Design

Contents

1. Responsive Web Design

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)

Desktop

Tablet

Phone

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

The Viewport

Example

[Without the viewport meta tag](#)   [With the viewport meta tag](#)

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.

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

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

Breakpoint

- Certain parts of the design will **behave differently on each side** of the breakpoint

- Typical Device Breakpoints

```css
/* 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) {...}
```

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">
  <img src="img_flowers.jpg" alt="Flowers">
</picture>
```

2. Bootstrap

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

Bootstrap Starter template and BootstrapCDN

```html
<!doctype html>
<html lang="en">
    <head>
        <!-- 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://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/bootstrap.min.css" crossorigin="anonymous">

        <title>Bootstrap</title>
    </head>
    <body>
        <!-- Your code -->

        <script src="https://cdn.jsdelivr.net/npm/jquery@3.5.1/dist/jquery.slim.min.js" crossorigin="anonymous"></script>
        <script src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/js/bootstrap.bundle.min.js" crossorigin="anonymous"></script>
    </body>
</html>
```

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
```

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

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

Containers

- Containers are **required** when using the default grid system.

- Containers are used to contain, pad, and (sometimes) center the content within them.

- Bootstrap comes with three different containers:

  - **.container**: Fixed-width container (which sets a **max-width** at each responsive breakpoint)
    ```
    <div class = "container">
    <!-- Content here -->
    </div>
    ```

  - **.container-fluid**: Fluid-width (which is **width: 100%** at all breakpoints)
    ```
    <div class = "container-fluid">
    <!-- Content here -->
    </div>
    ```

  - **.container-{breakpoint}**, which is width: 100% until the specified breakpoint

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Containers

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

Responsive breakpoints

```css
// 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) { ... }
```

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)				

Grid options

Responsive classes - Example

```html
<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>
```

Auto-layout columns

Equal-width

```
<div class="container">
    <div class="row">
        <div class="col">1 of 3</div>
        <div class="col">2 of 3</div>
        <div class="col">3 of 3</div>
    </div>
</div>
```

Auto-layout columns

Equal-width multi-line

```html
<div class="container">
    <div class="row">
        <div class="col">col</div>
        <div class="col">col</div>

        <div class="w-100"></div>

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

Offsetting columns

Offset classes

- Move columns to the right using **.offset-{breakpoint}-*** classes. These classes increase the left margin of a column by * columns.

- For example**, .offset-md-4** moves **.col-md-4** over four columns.

```
<div class="container">
    <div class="row">
        <div class="col-md-4">.col-md-4</div>
        <div class="col-md-4 offset-md-4">.col-md-4 .offset-md-4</div>
    </div>
</div>
```
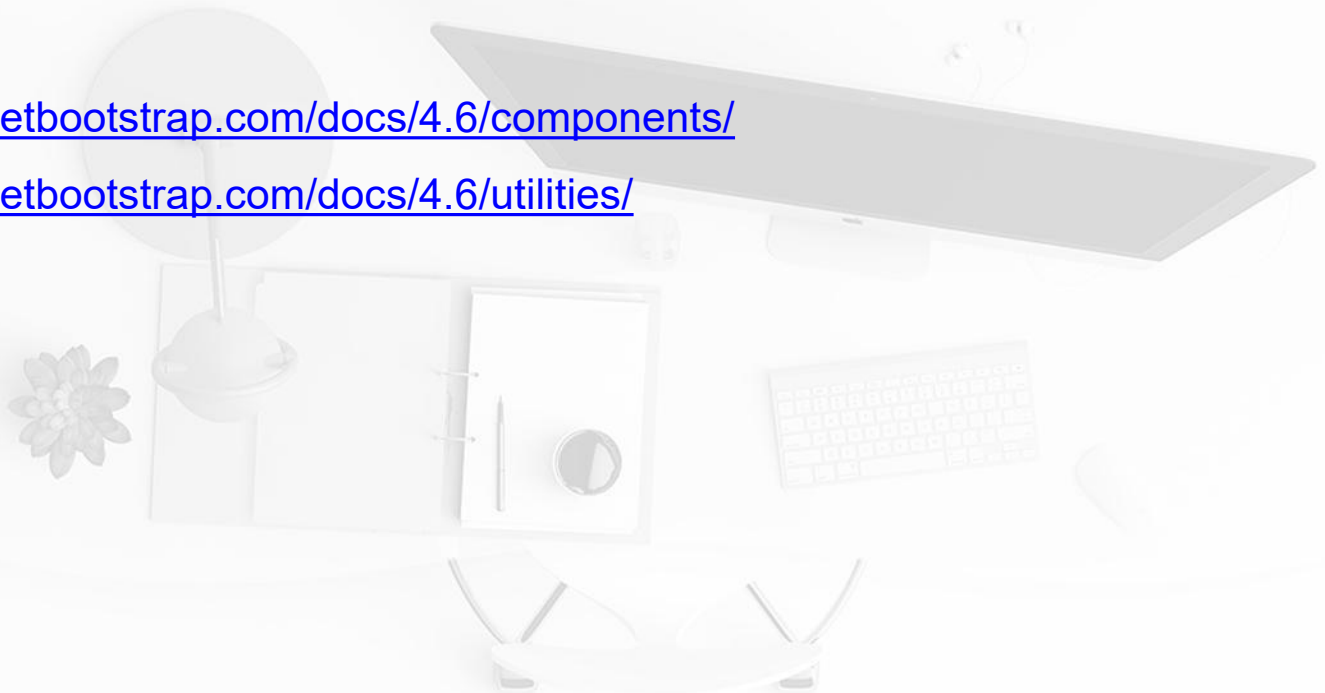
Nesting

- To nest your content with the default grid, add a new **.row** and set of **.col-{breakpoint}-*** columns within an **existing .col-{breakpoint}-*** column.
- Nested rows should include a set of columns that add up to 12 or fewer (it is not required that you use all 12 available columns).

```html
<div class="container">
    <div class="row">
        <div class="col-sm-9">
            Level 1: .col-sm-9
            <div class="row">
                <div class="col-8 col-sm-6">
                    Level 2: .col-8 .col-sm-6
                </div>
                <div class="col-4 col-sm-6">
                    Level 2: .col-4 .col-sm-6
                </div>
            </div>
        </div>
    </div>
</div>
```

Components and Utilities

Link:

- https://getbootstrap.com/docs/4.6/components/

- https://getbootstrap.com/docs/4.6/utilities/

Components and Utilities

Example

- **Outline buttons**


```html
<button type="button" class="btn btn-outline-primary">Primary</button>
<button type="button" class="btn btn-outline-secondary">Secondary</button>
<button type="button" class="btn btn-outline-success">Success</button>
<button type="button" class="btn btn-outline-danger">Danger</button>
<button type="button" class="btn btn-outline-warning">Warning</button>
<button type="button" class="btn btn-outline-info">Info</button>
<button type="button" class="btn btn-outline-light">Light</button>
<button type="button" class="btn btn-outline-dark">Dark</button>
```

Components and Utilities

Example

- **Media object**


```html
<div class="media">
  <img src="..." class="mr-3" alt="...">
  <div class="media-body">
    <h5 class="mt-0">Media heading</h5>
    Cras sit amet nibh libero, in gravida nulla. Nulla vel metus scelerisque ante sollicitudin. Cras
  </div>
</div>
```

Responsive images

- Images in Bootstrap are made responsive with **.img-fluid. max-width: 100%;** and **height: auto;** are applied to the image so that it scales with the parent element.

- Example:

```
<img src="..." class="img-fluid" alt="...">
```

Summary

Exercise

Utilized Bootstrap to develop a responsive mobile UI layout for the Lani & Dani webpage.

Q&A