



Responsive Web Design with Bootstrap

SENG 4640

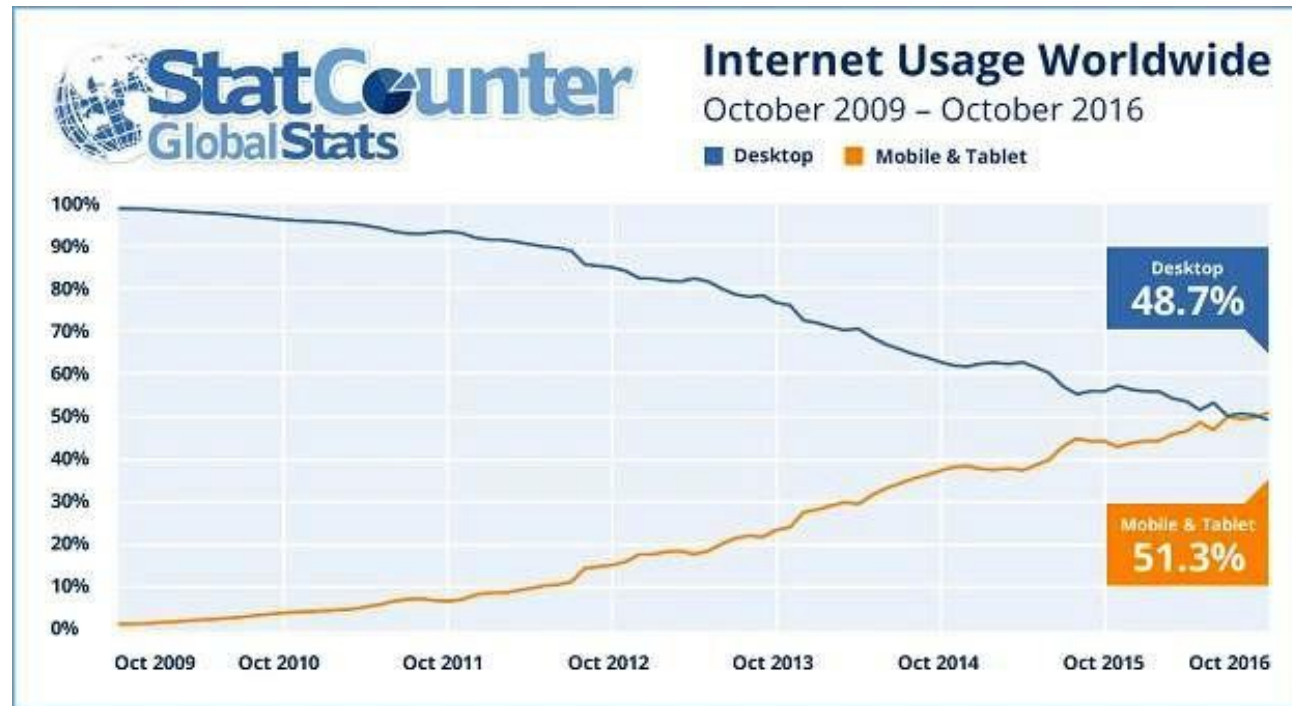
Software Engineering for Web Apps
Winter 2023

Sina Keshvadi
Thompson Rivers University

Considering Multiple Devices



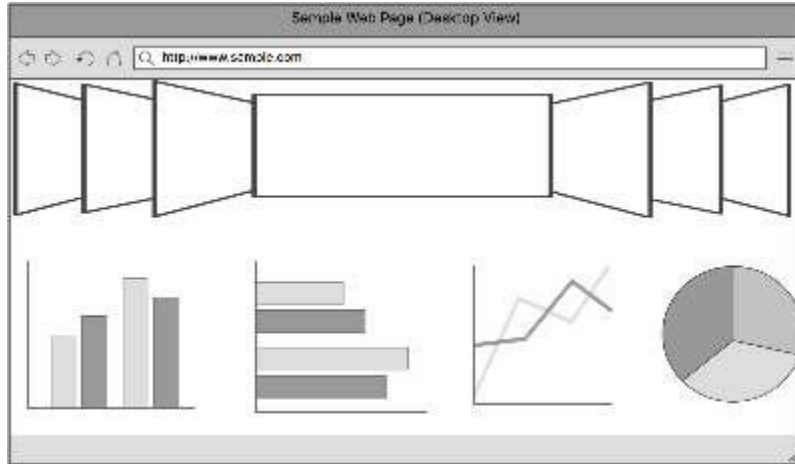
Considering Multiple Devices



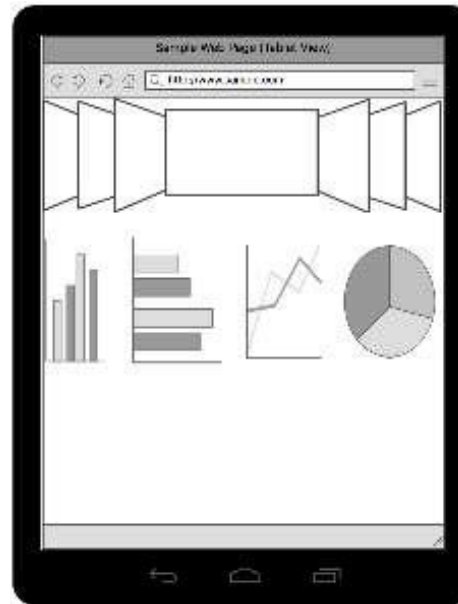
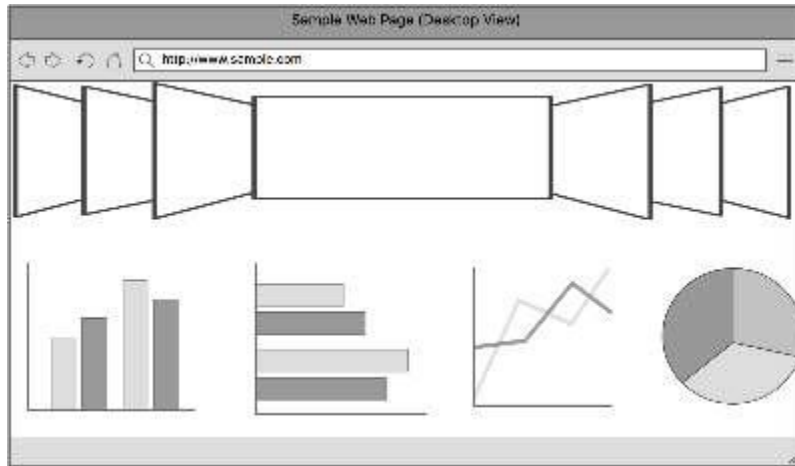
Heisler, Yoni. "Mobile internet usage surpasses desktop usage for the first time in history." BGR. N.p., 02 Nov. 2016. Web.

As of October 2016, mobile and tablet internet usage has surpassed desktop internet usage, constituting more than half of all worldwide usage

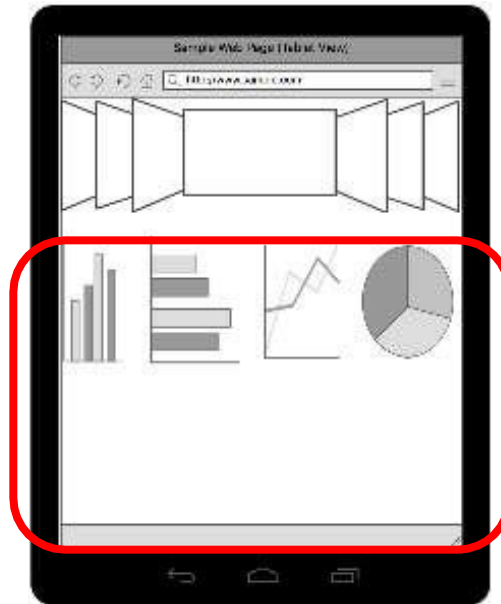
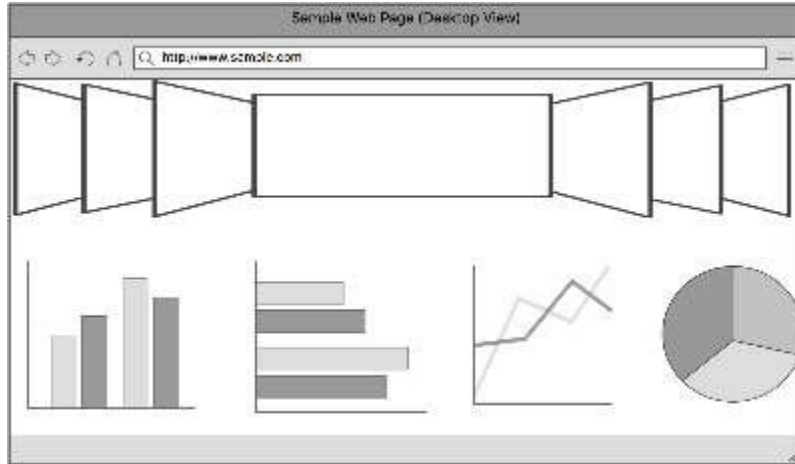
Traditional Web Design



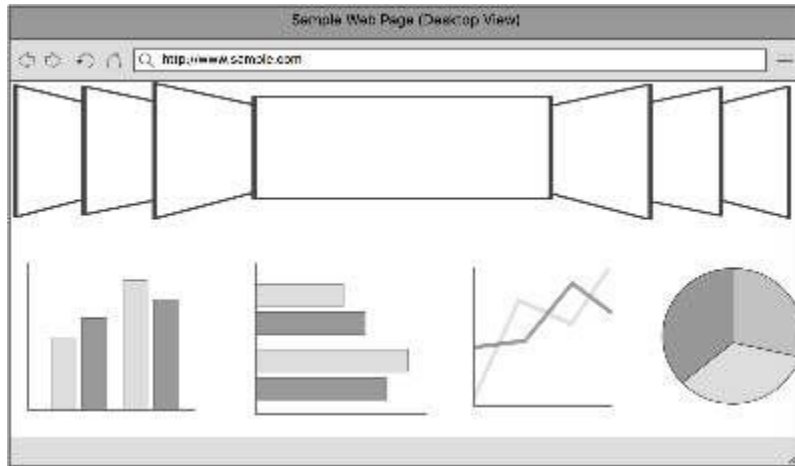
Traditional Web Design



Traditional Web Design



Responsive Web Design



Responsive Web Design

- **Responsive Web Design (RWD)** – approach to designing web pages in a way that takes all possible devices into account
- Approach must be visually flexible to adapt to all potential screen sizes



Achieving RWD - Challenges

- How should we go about achieving RWD?
- Providing CSS for each possible platform is challenging as new devices become available
- Manual CSS implementation would take quite a bit of time and effort

Solution: Automatic RWD

- **Bootstrap** – open source front-end development framework produced and maintained by Twitter that aids in producing clean, responsive web pages and applications
 - “Mobile-first” library
 - CSS with predefined tags for developers’ use
 - Includes UI components, layouts, and other tools



Bootstrap

Bootstrap Grid System

- **Grid System** – Bootstrap’s solution to making the most of the space provided on a given platform
 - Includes between 1 and 12 columns depending on scale of device viewport
 - Utilizes predefined classes to maximize web page layout options

Using Bootstrap

1

Begin with basic HTML page

```
<!DOCTYPE html>
<html>
<head>
  <title>Bootstrap Example</title>
</head>

<body>
  <!-- content will go here -->
</body>

</html>
```

Using Bootstrap

2

Include Bootstrap in your project

- Include the following within the <head> section
- See <https://getbootstrap.com/getting-started/> for most recent versions

```
<!-- Latest compiled and minified CSS -->
<link rel="stylesheet"
      href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">

<!-- jQuery Library -->
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.1/jquery.min.js">
</script>

<!-- Latest compiled JavaScript -->
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js">
</script>
```

Using Bootstrap

3

Additional Details: Utilize 'mobile-first' framework
(Add within <head> section above other tags)

```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

Using Bootstrap

3

Additional Details: Utilize 'mobile-first' framework (Add within `<head>` section above other tags)

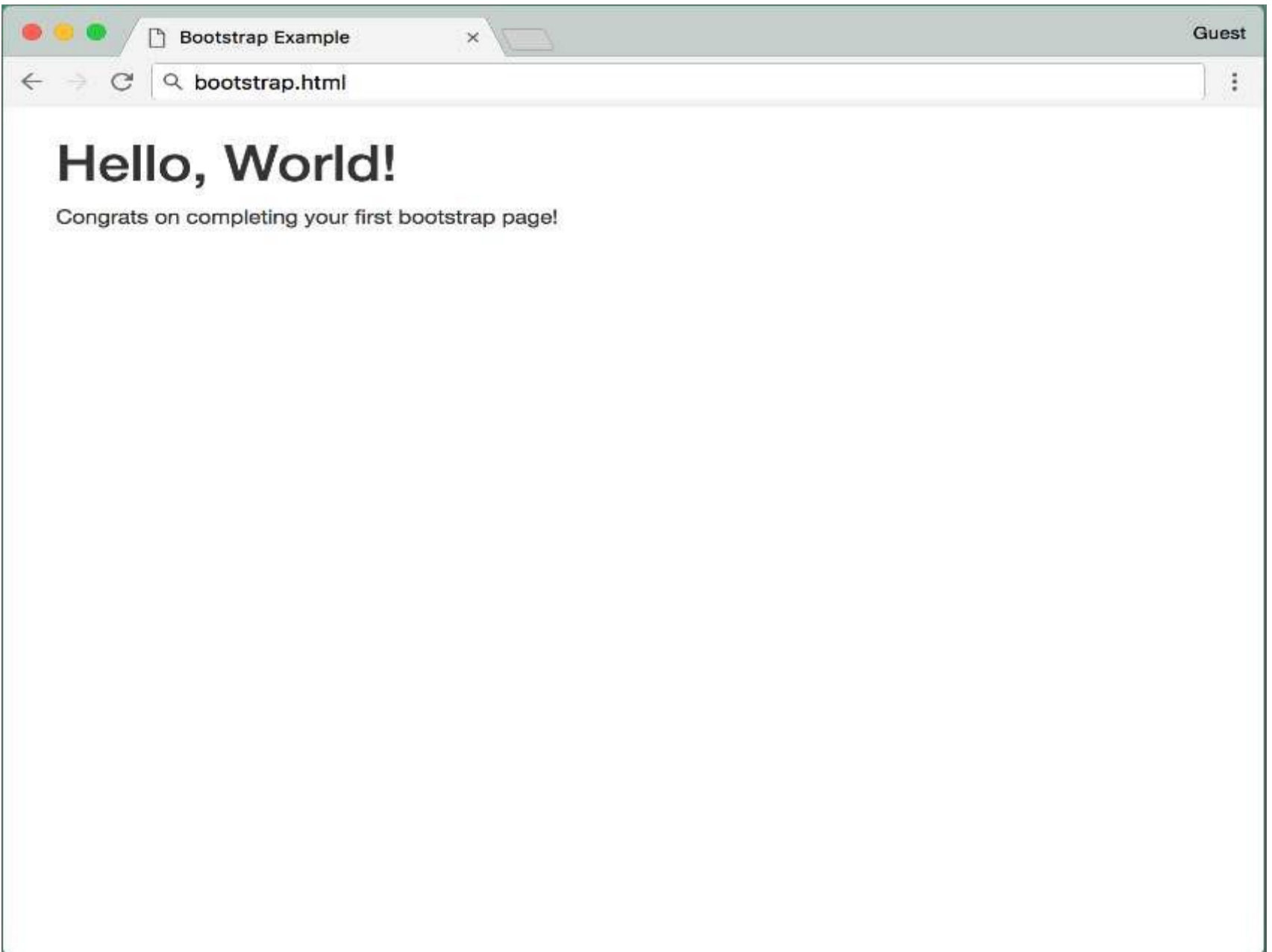
```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

4

Add content in the `<body>`

- Create a `<div>` using the "container" class

```
<body>  
  <div class="container">  
    <h1> Hello, World! </h1>  
    <p> Congrats on completing your first bootstrap page! </p>  
  </div>  
</body>
```



Hello, World!

Congrats on completing your first bootstrap page!

Using the Bootstrap Grid System

- Content is organized into **rows**: “horizontal group of columns”
- If no set width is specified, Bootstrap will automatically size all columns in a row so that they are equally spaced
- Column classes allow user to indicate width of a column represented as columns out of 12 that should be used

```
<body>

  <div class="container">
    <div class="row">
      <div class="col-md-4">This is the first piece of RWD content.</div>
      <div class="col-md-4">This is the second piece of RWD content.</div>
      <div class="col-md-4">This is the third piece of RWD content.</div>
    </div>
  </div>

  <p>

  <table width="100%" border="1">
    <tr align="center">
      <td>This is the first table cell</td>
      <td>This is the second table cell</td>
      <td>This is the third table cell</td>
    </tr>
  </table>

</body>
```

This is the first piece of RWD content.	This is the second piece of RWD content.	This is the third piece of RWD content.
This is the first table cell	This is the second table cell	This is the third table cell



```
<body>
```

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

```
<div class="col-md-4">This is the third piece of RWD content.</div>
```

```
</div>
```

```
</div>
```

```
<p>
```

```
<table width="100%" border="1">
```

```
<tr align="center">
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<td>This is the first table cell</td>
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```
</tr>
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</table>
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</body>
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    </tr>
  </table>

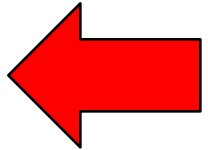
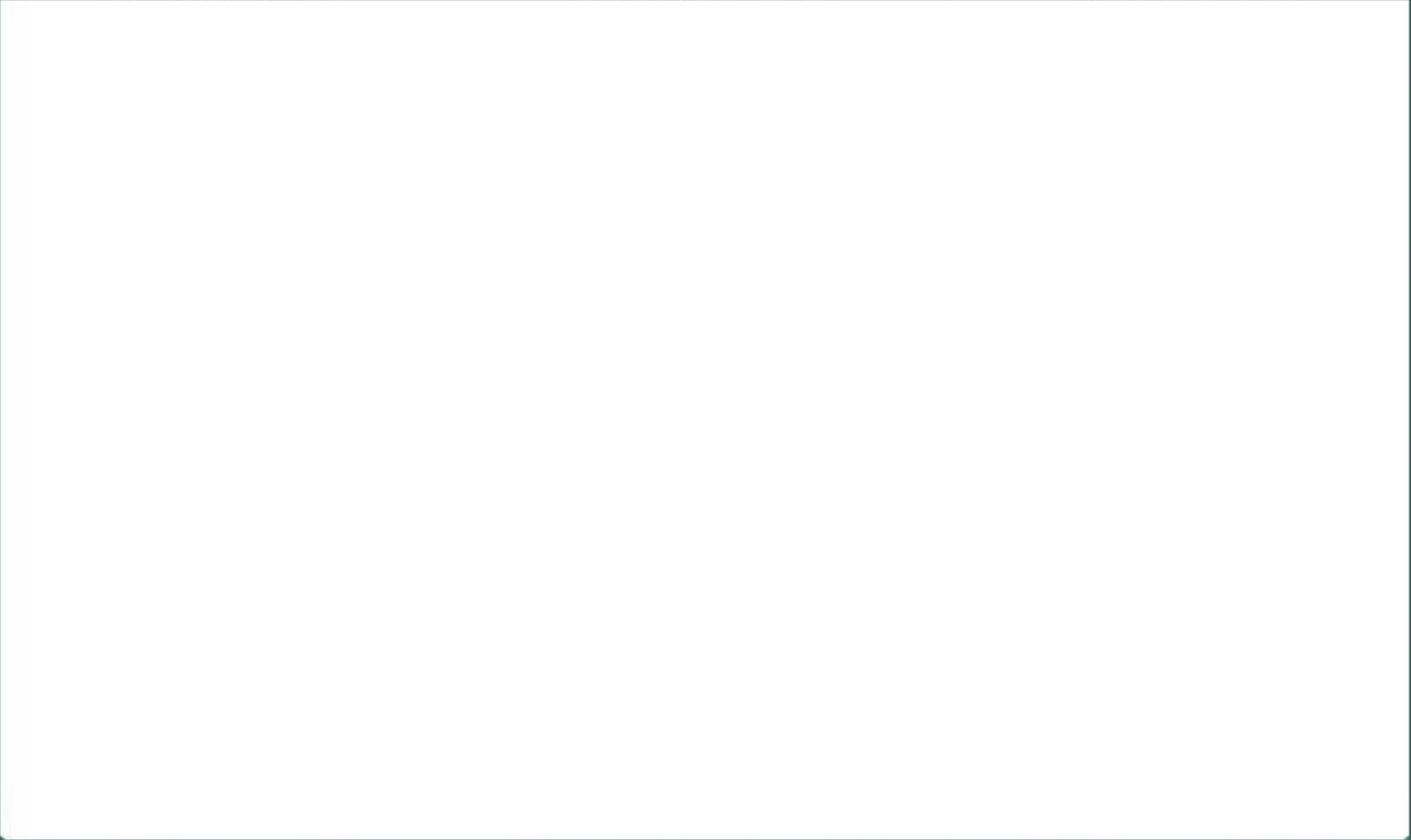
</body>
```

Bootstrap Example x Guest

bootstrap.html

This is the first piece of RWD content.
This is the second piece of RWD content.
This is the third piece of RWD content.

This is the first table cell	This is the second table cell	This is the third table cell
------------------------------	-------------------------------	------------------------------




Bootstrap Example Guest

bootstrap.html

This is the first piece of RWD content.
This is the second piece of RWD content.
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This is the first table cell	This is the second table cell	This is the third table cell
------------------------------	-------------------------------	------------------------------





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This is the first table cell	This is the second table cell	This is the third table cell
------------------------------	-------------------------------	------------------------------



This is the first piece of RWD content.
This is the second piece of RWD content.
This is the third piece of RWD content.

This is the first table cell

This is the second table cell

This is the third table cell

- Back
- Forward
- Reload

- Save As...
- Print...
- Cast...
- Translate to English

- View Page Source
- Inspect

This is the first piece of RWD content.
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This is the first table cell	This is the second table cell	This is the third table cell
------------------------------	-------------------------------	------------------------------

```

<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body>...</body>
</html>

```

html

Styles Event Listeners

:hov .cls +

Console

top Filter Verbose

Responsive ▼

960 x 796 50% ▼

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------------------------------	-------------------------------	------------------------------

Elements >>

```
<!DOCTYPE html>  
...<html lang="en"> == $0  
  ▶<head>...</head>  
  ▶<body>...</body>  
</html>
```

html

Styles Event Listeners >>

:hov .cls +

Console X

top ▼ Filter Verbose ▼ ⚙

Responsive ▾ 960 x 796 50% ▾

- ✓ Responsive
- Galaxy S5
- Nexus 5X
- Nexus 6P
- iPhone 5
- iPhone 6
- iPhone 6 Plus
- iPad
- iPad Pro
- Edit...

This is the
This is the
This is the

This is the first ta	e second table cell	This is the third table cell
----------------------	---------------------	------------------------------

Elements >>

```
<!DOCTYPE html>  
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▶<body>...</body>  
</html>
```

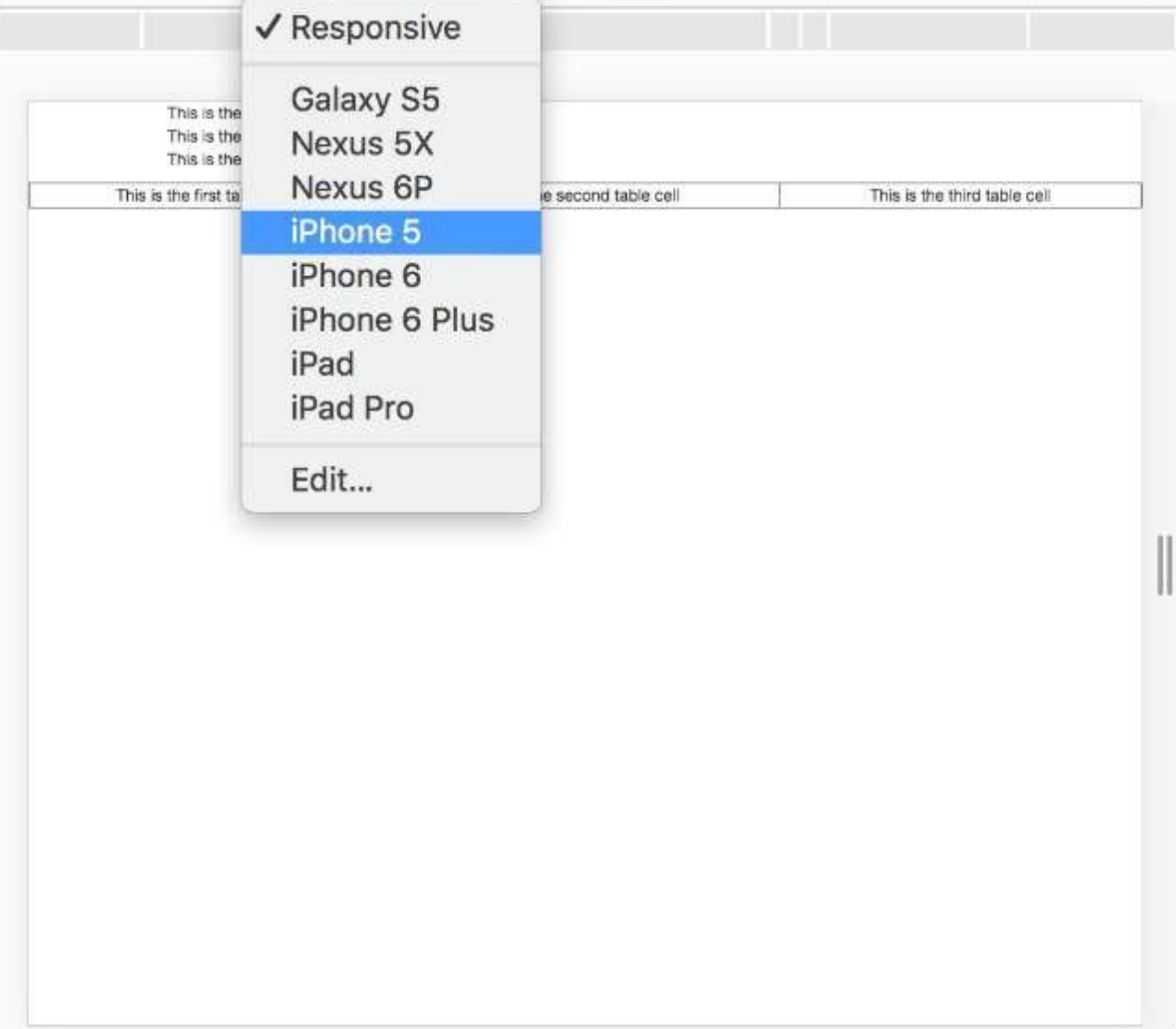
html

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  ▶<body>...</body>  
</html>
```

html

```
:hov .cls +
```

iPad

768 x 1024 38%

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Elements

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html

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  ▶<head>...</head>  
  ▶<body>...</body>  
</html>
```

html

:hov .cls +

Learning more about Bootstrap

- There are many examples of Bootstrap layouts and components at

<https://getbootstrap.com/getting-started/#examples>

- The best way to learn is to select an example and view its source code.
 - This source code is available for re-use
 - Access source code by right-clicking in the web page and selecting “View Page Source”
 - Or right-click on an element and select “Inspect”



Buttons



Tables



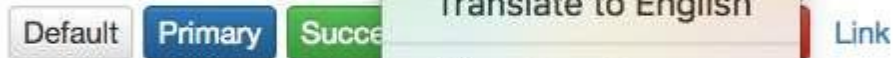
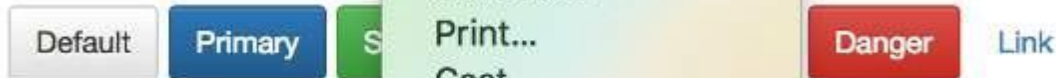
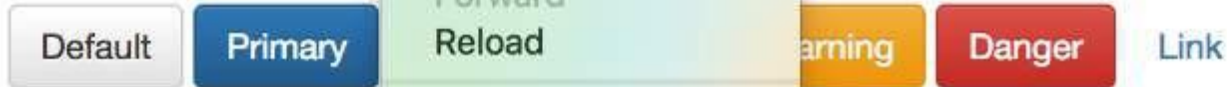
Buttons



Tables



Buttons



- Back
- Forward
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Tables

getbootstrap.com/examples/theme/

1024 x 768

Elements Console Sources Network Performance

Bootstrap theme

Home

About

Buttons

Default

Primary

Success

Default

Primary

Success

Info

Default

Primary

Success

Info

Warning

Default

Primary

Success

Info

Warning

Tables

#	First Name	Last Name
1	Mark	Otto

```
>>> <nav class="navbar navbar-inverse navbar-fixed-top">...</nav>
>>> <div class="container theme-showcase" role="main">
  ::before
  <!-- Main jumbotron for a primary marketing message or call to action -->
  >>> <div class="jumbotron">...</div>
  >>> <div class="page-header">...</div>
  >>> <p>
    <button type="button" class="btn btn-lg btn-default">Default</button>
    <button type="button" class="btn btn-lg btn-primary">Primary</button>
    <button type="button" class="btn btn-lg btn-success">Success</button>
    <button type="button" class="btn btn-lg btn-info">Info</button>
    <button type="button" class="btn btn-lg btn-warning">Warning</button>
    <button type="button" class="btn btn-lg btn-danger">Danger</button>
    <button type="button" class="btn btn-lg btn-link">Link</button>
  </p>
  >>> <p>...</p>
  >>> <p>...</p>
  >>> <p>...</p>
  >>> <div class="page-header">...</div>
  >>> <div class="row">...</div>
  >>> <div class="row">...</div>
```

html body div.container.theme-showcase p button.btn.btn-lg.btn-primary

Styles Event Listeners DOM Breakpoints Properties

Filter

:hov .cls +

Console



top

Filter

Verbose



Review: Part 1

- **HTTP** is the protocol used to transfer content on the Web
- **HTML** allows us to specify the structure of Web content
- **CSS** is a formatting language used to describe the appearance of content in an HTML file
- **RWD** libraries provide CSS formatting that we can use to address the challenges of displaying Web content on various devices