



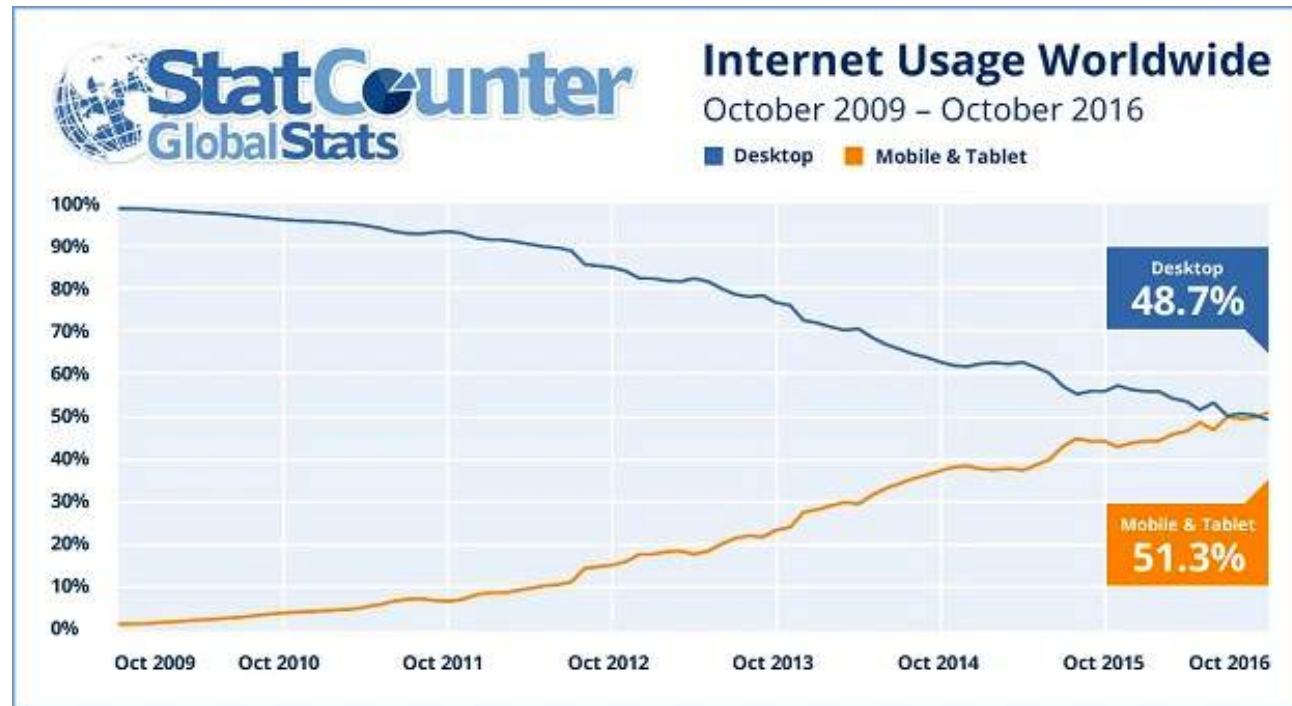
Video 1.9

Chris Murphy

Considering Multiple Devices



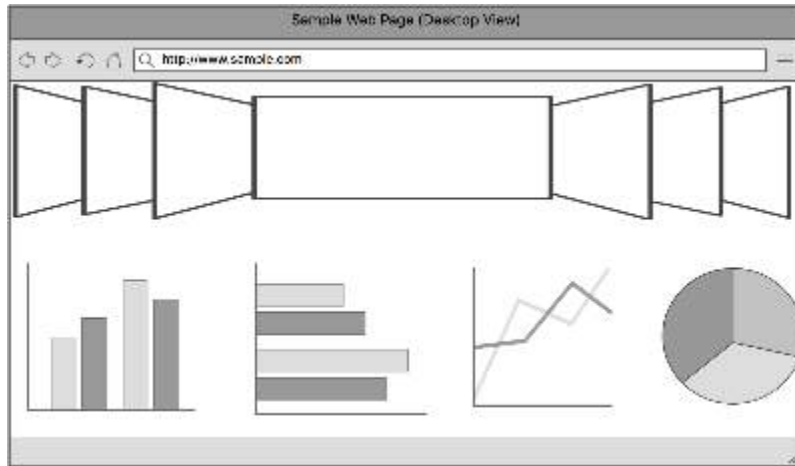
Considering Multiple Devices



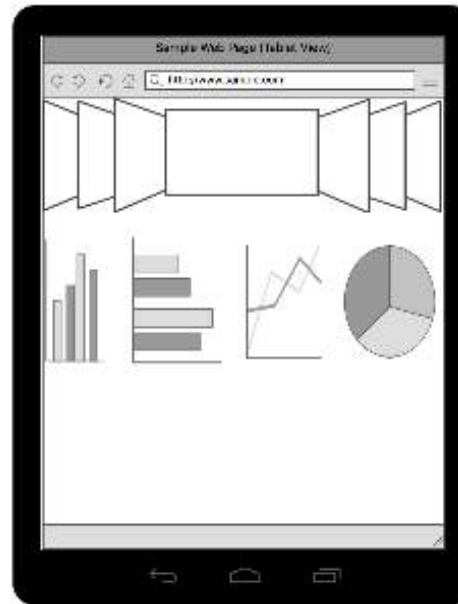
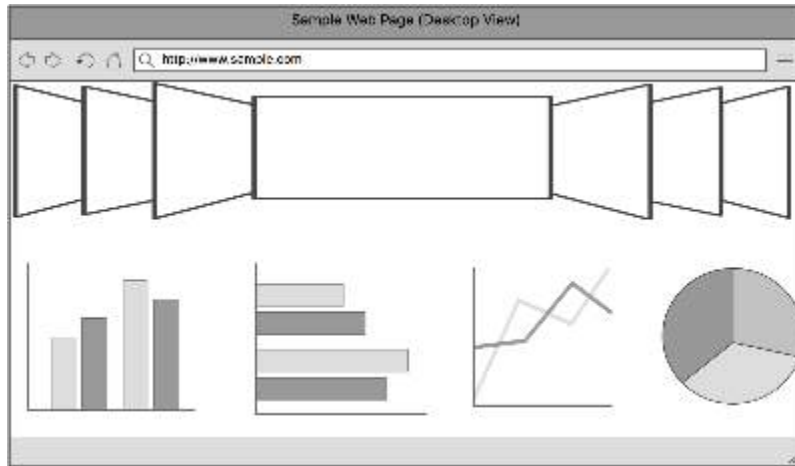
Heisler, Yoni. "Mobile internet usage surpasses desktop usage for the first time in history." BGR. N.p., 02 Nov. 2016. Web.

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

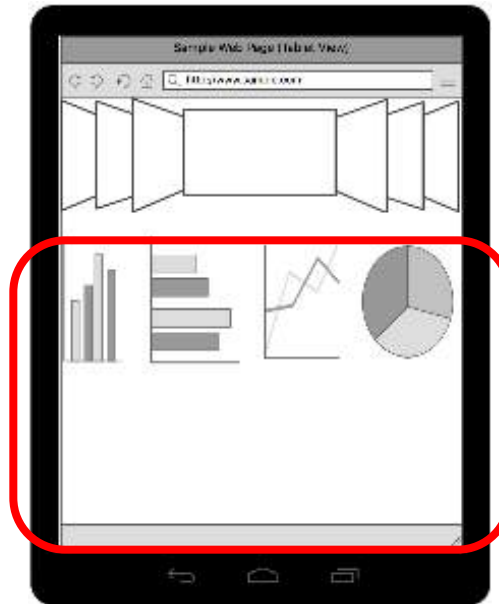
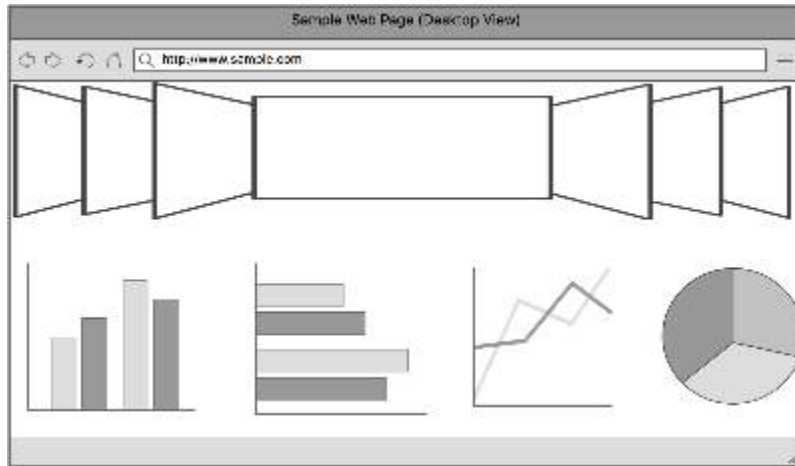
Traditional Web Design



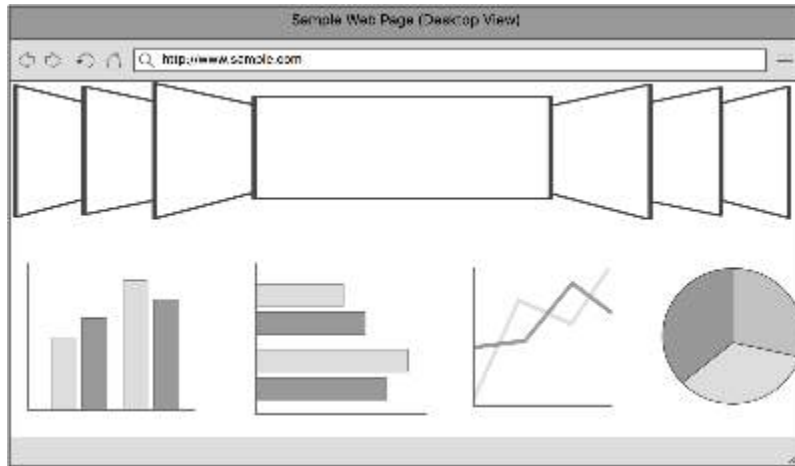
Traditional Web Design



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 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)

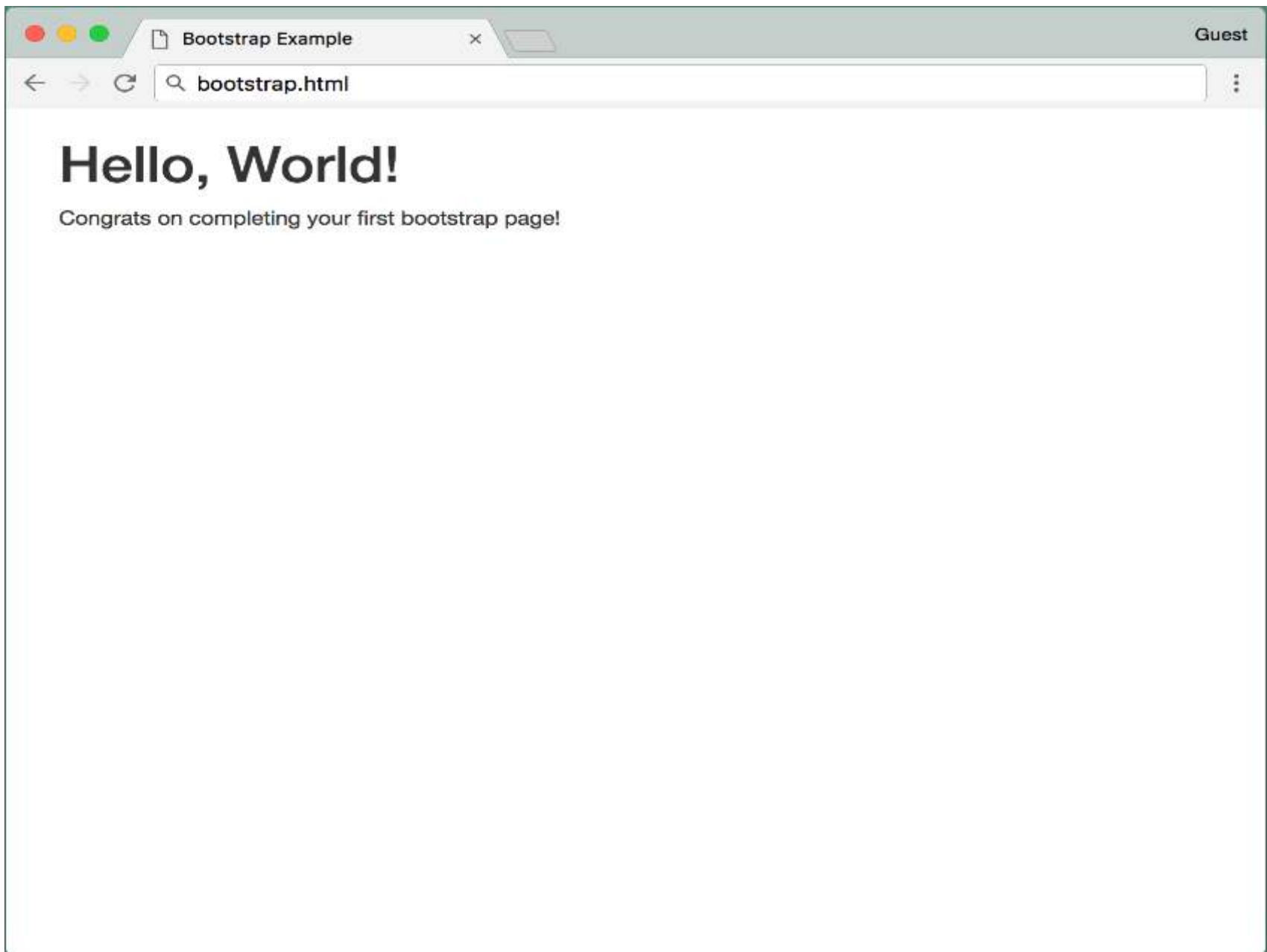
```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

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>
```



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>
```

```
<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>
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```
      <td>This is the second table cell</td>
```

```
      <td>This is the third table cell</td>
```

```
    </tr>
```

```
  </table>
```

```
</body>
```

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  </table>

</body>
```

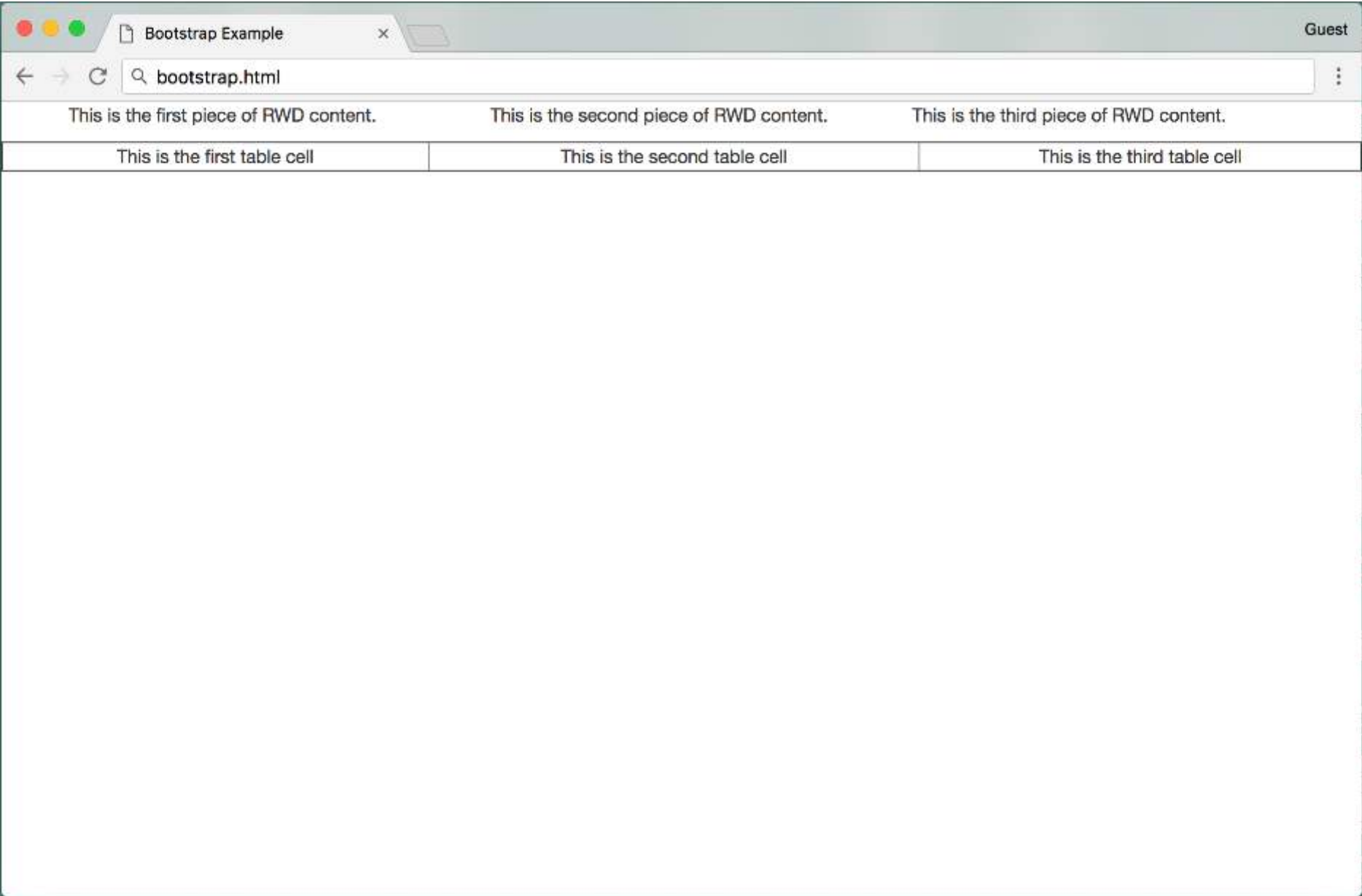
```
<body>

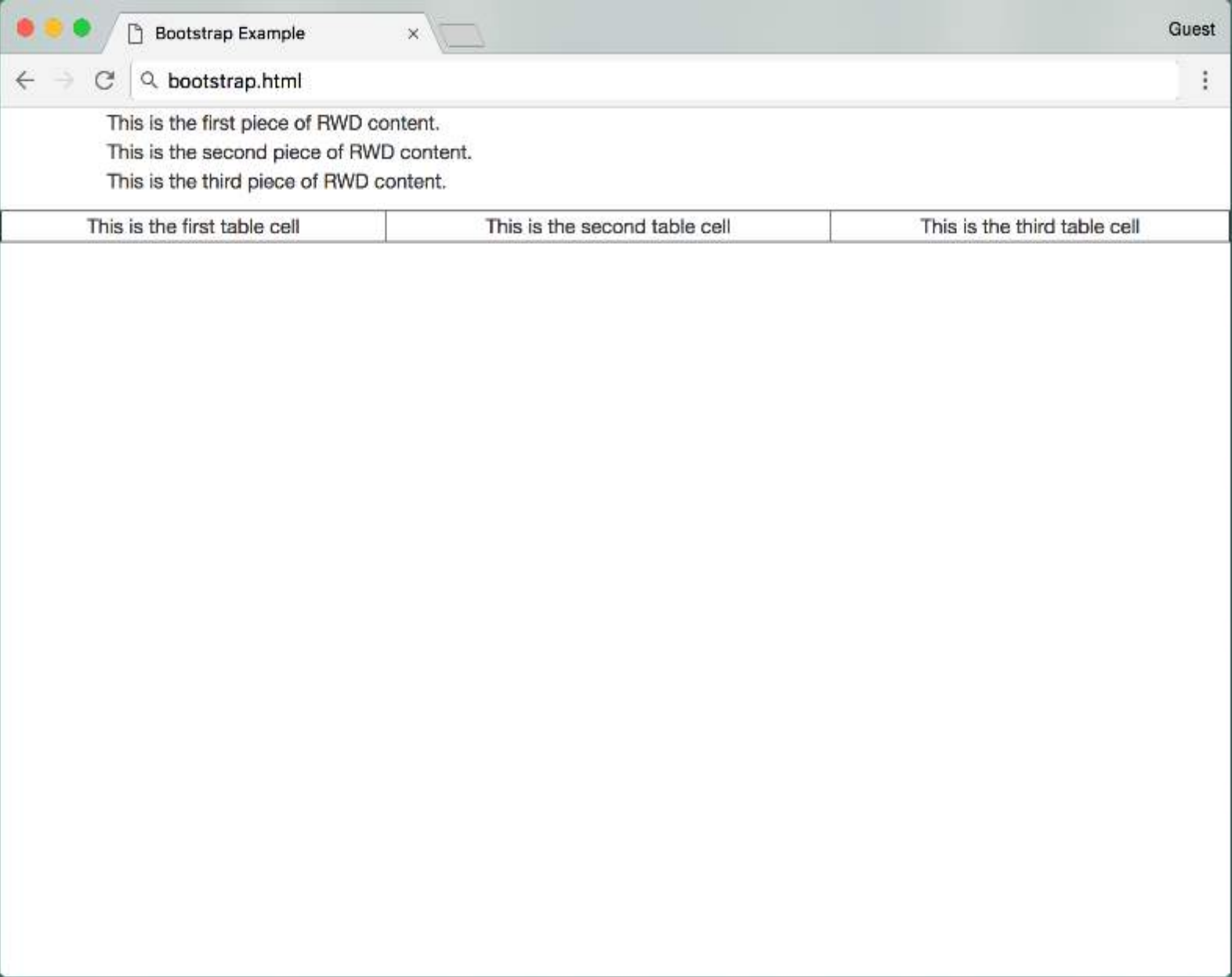
  <div class="container">
    <div class="row">
      <div class="col-md-4">This is the first piece of RWD content.</div>
      <div class="col-md-4">This is the second piece of RWD content.</div>
      <div class="col-md-4">This is the third piece of RWD content.</div>
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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





Bootstrap Example

Guest

←

→

↺

🔍

bootstrap.html

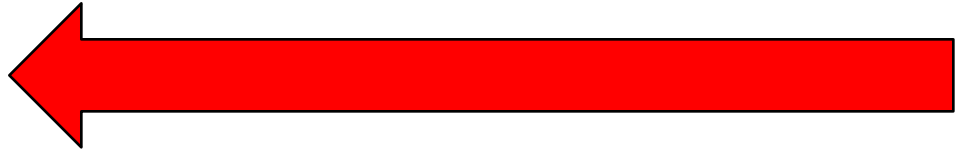
⋮

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
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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
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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.
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

Bootstrap Example

/bootstrap.html

Responsive ▾ 960 x 796 50% ▾

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

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

html

Styles Event Listeners >>

:hov .cls +

Console

top ▾ Filter Verbose ▾

Property of Penn Engineering, Chris Murphy

Bootstrap Example

Guest

← → ↻

/bootstrap.html

⋮

Responsive ▼

960 x 796 50% ▼

⋮

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
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Elements >> ⋮ ✕

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html

Styles Event Listeners >>

:hov .cls +

⋮ Console ✕

⊘ top ▼ Filter Verbose ▼ ⚙

Property of Penn Engineering, Chris Murphy



Bootstrap Example

/bootstrap.html

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
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e second table cell

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Elements

>>

<!DOCTYPE html>

<html lang="en"> == \$0

>>><head>...</head>

>>><body>...</body>

</html>

html

Styles

Event Listeners >>

:hov .cls +

Console

top ▾

Filter

Verbose ▾

Property of Penn Engineering, Chris Murphy

Bootstrap Example

Guest

/bootstrap.html

iPhone 5 320 x 568 50%

This is the first piece of RWD content.

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Elements

>>

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</html>

html

Styles

Event Listeners >>

:hov .cls +

Console

top

Filter

Verbose

Property of Penn Engineering, Chris Murphy

Bootstrap Example

Guest

←

→

↻

/bootstrap.html

iPad ▼

768 x 1024 38% ▼

⛔

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
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Elements >>

<!DOCTYPE html>
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html

Styles Event Listeners >>

:hov .cls +

Console

top ▼ Filter Verbose ▼ ⚙

Bootstrap Example


Guest

← → ↻

/bootstrap.html

⋮

iPad ▾ 768 x 1024 38% ▾



⋮

This is the first piece of RWD content.
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Elements >> ⋮ ✕

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

html

Styles Event Listeners >>

:hov .cls +

⋮ Console ✕

ⓧ top ▾ Filter Verbose ▾ ⚙

Bootstrap Example

/bootstrap.html

iPad 1024 x 768 46%

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

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

html

Styles Event Listeners

:hov .cls +

Console

top Filter Verbose

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



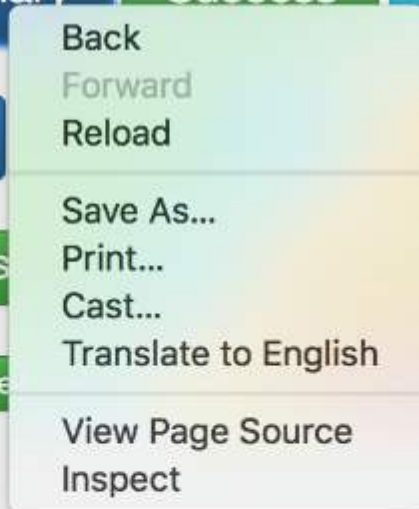
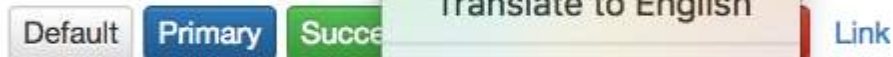
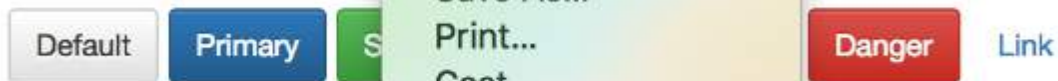
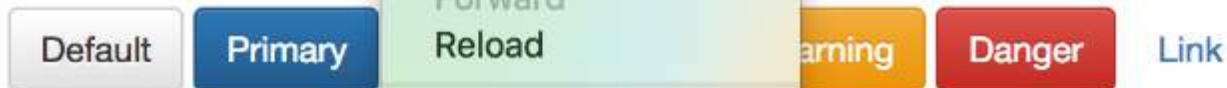
Buttons



Tables



Buttons



Tables



Buttons



Tables

Theme Template for Bootstrap

Guest

getbootstrap.com/examples/theme/

1024 x 768

Bootstrap themeHomeAbout

Buttons

DefaultPrimarySuccess

DefaultPrimarySuccessInfo

DefaultPrimarySuccessInfoWarning

Tables

#	First Name	Last Name
1	Mark	Otto

ElementsConsoleSourcesNetworkPerformance

```
<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>

```

htmlbodydiv.container.theme-showcasepbutton.btn.btn-lg.btn-primary

StylesEvent ListenersDOM BreakpointsProperties

Filter: :hov .cls +

Console

topFilterVerbose

Property of Penn Engineering, Chris Murphy

getbootstrap.com/examples/theme/

1024 x 768

Bootstrap theme

Home

About

Buttons

Default

Primary

Success

Default

Primary

Success

Info

Default

Primary

Success

Info

Default

Primary

Success

Info

Warning

Tables

#	First Name	Last Name
1	Mark	Otto



Elements

Console

Sources

Network

Performance



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    <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: Week 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