



Basics of Bootstrap

Session 1



Objectives

At the end of this session, you will be able to:

- Describe Bootstrap
- Explain the basic concepts of Bootstrap
- Describe the process of setting up Bootstrap
- Outline the file structure and the default source code in Bootstrap
- Use Bootstrap with CSS and JS
- Describe the significance of Bootstrap templates



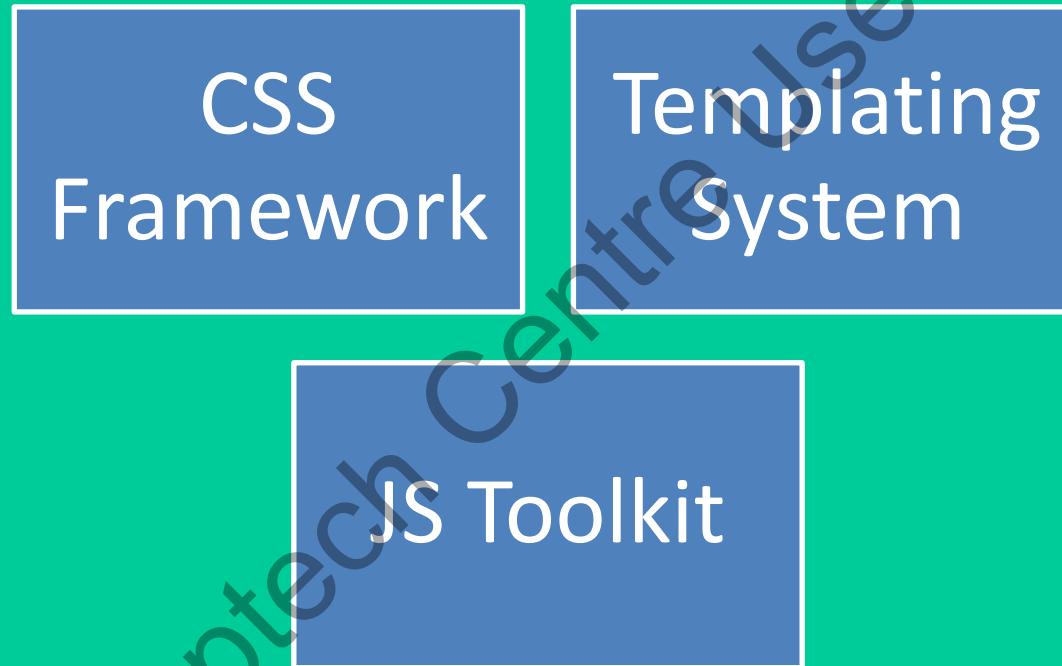
Introduction (1-2)

- Bootstrap is an open-source framework
- It is easy to use and understand
- It is also known as front-end Framework
- Used to make responsive Websites and Web applications
- It includes JS (JavaScript), CSS (Cascading Style Sheets), and HTML (Hyper Text Mark-up Language).
- It designs variety of components – forms, layout, navigation, and JavaScript Extensions.



Introduction (2-2)

- Bootstrap is:



Benefits of Bootstrap (1-4)

Easy and Flexible

- It is easy, adaptable and quick to use
- It can be used with CSS, LESS, or SASS (Syntactically Awesome Style Sheets)

100% Responsive Designs

- Adaptive to each Internet-enabled devices – tablets, smartphones, and laptops
- Fluid Grid Layout readjusts dynamically to the screen resolution

Great Grid System

- Implements 12 columns responsive grid
- Supports offset and nested elements



Benefits of Bootstrap (2-4)

Better Development Speed

- It has readymade blocks of code for designing
- Developers are not required to know HTML and CSS coding

Browser Compatibility

- Resolves many cross-browser compatibility issues
- Web applications runs smoothly in Web browsers – Chrome, Safari, IE (Internet Explorer), and Firefox

Customization

- It can be customized by selecting required aspects available on the Bootstrap customize page



Benefits of Bootstrap (3-4)

Consistency

- Mark Otto released first open-source Bootstrap version
- He also described framework expansion through single core concept of merging designers and developers

Big Support

- Web developers can get kind of help from a big supportive community of Bootstrap
- It is hosted and updated on GitHub with 500 contributors

Bundled JavaScript Components

- A pre-defined set of JS components are used for different functionalities of User Interface components
- Examples – tooltips, alerts, and modal windows



Benefits of Bootstrap (4-4)

Simple Integration

- Bootstrap can be integrated with other frameworks and platforms, also for existing Websites

Extensive Pre-styled Components

- Bootstrap has different pre-styled components for Drop-downs, alerts, and navigation bars



Setting Up Bootstrap

- Easy to download, install, and set up
- Two ways to start:

Download from
getbootstrap.com

Include it from Content
Delivery Network (CDN)



Download Bootstrap

- Download bootstrap latest version 3.3.7
- Follow the steps to download:

Go to homepage of
getbootstrap.com

Click the 'Download
Bootstrap' button

Select the option from
download page – Download
bootstrap, download source,
and download Sass



Content Delivery Network (CDN)

- Content Delivery Network (CDN) is a network of distributed servers
- Delivers Webpages or Web content to various user locations
- It is for those developers who do not want to host the framework
- Closer the server, faster the network
- Benefit of fast and quick loads



File Structure and Source Code

- A ZIP file contains the directories and files
- Extracted files are: structured CSS, JavaScript, and font directories
- Web developers uses desired components and plugins by drag-drop on a Webpage
- **Bootstrap.*.maps** contains CSS source maps
- Includes Glyphicon fonts and bootstrap theme (optional)



File Structure of Precompiled Bootstrap Version

```
bootstrap/
+-- css/
|   +-- bootstrap.css
|   +-- bootstrap.css.map
|   +-- bootstrap.min.css
|   +-- bootstrap.min.css.map
|   +-- bootstrap-theme.css
|   +-- bootstrap-theme.css.map
|   +-- bootstrap-theme.min.css
|   +-- bootstrap-theme.min.css.map
+-- js/
|   +-- bootstrap.js
|   +-- bootstrap.min.js
+-- fonts/
+-- glyphicons-halflings-regular.eot
+-- glyphicons-halflings-regular.svg
+-- glyphicons-halflings-regular.ttf
+-- glyphicons-halflings-regular.woff
+-- glyphicons-halflings-regular.woff2
```



Bootstrap File Structure

- Bootstrap File Structure has following categories:

Scaffolding	CSS	Components	JavaScript Plugins
<ul style="list-style-type: none">Basic grid structureSimple layoutsBackgroundLink Styles	<ul style="list-style-type: none">Global CSS settingsAdvanced Grid SystemBasic HTML elements styles	<ul style="list-style-type: none">Styles for reusable componentsAlerts, tabs, and page headers	<ul style="list-style-type: none">Customs and interactive jQuery pluginsModals, tooltips, and popovers



Default Bootstrap Template

- Conversion from HTML file into Bootstrapped file
- Include JQuery library before Bootstrap library
- Template includes following files:

Bootstrap.min.css

Jquery.min.js

Bootstrap.min.js

Html5shiv.min.js

Respond.min.js



MaxCDN Code

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

<!-- Optional theme -->
<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap-theme.min.css">

<!-- Compiled and minified jQuery -->
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.0/jquery.min.js"></script>

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



Bootstrap with CSS

- Bootstrap 2 had discretionary mobile-friendly styles
- Bootstrap 3 is mobile-friendly entirely
- A container element contains all the Website contents and grid system
- Two types of containers:

Fixed

- Preset width of viewport
- Does not change the width
- Easy to use and personalize
- Width in pixels
- *.container* class in <div> tag

Fluid

- Covers the width of whole viewport
- Changes the width as per change in the screen size
- Width is in percentage
- *.container-fluid* class in <div> tag



Bootstrap with JavaScript (1-2)

- Include JavaScript Plugins by two ways:



Using *.js files



Using bootstrap.js or bootstrap.min.js files

- Two ways of using JavaScript plugins:



Data attributes



JavaScript



Bootstrap with JavaScript (2-2)

Events

- Handle distinct actions of plugins
- Infinitive form and past participle form

Transitions

- Include transition.js to apply transition effects
- To achieve sliding and fading effects



Templates in Bootstrap

- A mock Website designed using Bootstrap framework
- Components – JS code, CSS code, HTML pages, fonts, and images
- Used for – e-commerce site, corporate portal, blog, or static page
- Blog Bootstrap template page:

The screenshot shows a blog post template layout. At the top left is a "Page Heading" and "Secondary Text". Below that is a "Blog Post Title" and the author "by Start Bootstrap". A timestamp "Posted on August 28, 2013 at 10:00 PM" is also present. To the right of the main content area is a "Blog Search" input field with a magnifying glass icon. Below it is a "Blog Categories" section listing five categories: Category Name, Category Name, Category Name, Category Name, and Category Name. Further down is a "Side Widget Well" containing placeholder text: "Lorem ipsum dolor sit amet, consectetur adipisicing elit. Inventore, perspiciatis adipisci accusamus laudantium odit aliquam repellat tempore quos aspernatur vero." At the bottom of the main content area is a "Read More >" button.



Summary (1-3)

- Bootstrap is an open-source Web framework for quickly developing front-end and responsive applications.
- Bootstrap uses CSS, HTML, JavaScript, and jQuery design interactive Webpages.
- Customization, browser compatibility, fully responsive pages, and an assortment of built-in components are the major benefits of Bootstrap.
- There are two ways to start using Bootstrap namely, downloading its files from getbootstrap.com or including them from a CDN.



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Summary (2-3)

- The structure of the precompiled Bootstrap version includes the css, js, and fonts directories offering components and plugins for drag-n-drop usage.
- The basic HTML Bootstrapped template includes **bootstrap.min.css**, **jquery.min.js**, **bootstrap.min.js**, and the jQuery library prior to the Bootstrap library.
- The default Bootstrapped template contains the viewport meta tag to make a Webpage responsive.



Summary (3-3)

- Bootstrap 3 is mobile first, which means the mobile-friendly styles are present throughout the library rather than in isolated files.
- Bootstrap comes with two types of containers namely, fixed width and full width containers.
- There are two ways of using JavaScript plugins namely, through data attributes and via JavaScript.
- Bootstrap template are sample Webpages designed for using the bootstrap framework.





Understanding Programming in Bootstrap

Session 2



Objectives

At the end of this session, you will be able to:

- Use different Bootstrap components
- Write programs in Bootstrap
- Apply CSS and JavaScript to Bootstrap components



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Components in Bootstrap

- Includes a collection of Less stylesheets use the components
- A set of configuration variables that control features of components
- Developers implement the components as CSS classes
- A variety of JavaScript components as jQuery plugins
- Bootstrap 3 supports web browsers – Firefox, Opera, Chrome, Safari, and IE
- Each component comprises:

HTML
Structure

CSS Code

JavaScript



Layout Components

Glyphicons

Navbars

Input Groups

Pagination

Page Header

Badges

Panels

List Groups

Progress bars



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Glyphicon (1-2)

- More than 250 glyphs or fonts
- ‘Glyphicons Halflings’ files in ‘font’ folder
- Need base and individual icon class
- Only elements neither text nor child element
- Syntax:

```
<span class="glyphicon glyphicon-<name>"></span>
```

- Recommended with nested `` tag

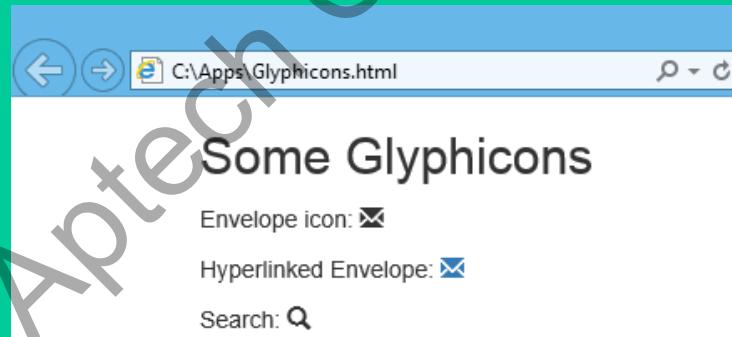


Glyphicon (2-2)

- Code snippet:

```
12
13 <div class="container">
14   <h2>Some Glyphicons</h2>
15   <p>Envelope icon: <span class="glyphicon glyphicon-envelope"></span></p>
16   <p>Hyperlinked Envelope:
17     <a href="#"><span class="glyphicon glyphicon-envelope"></span></a>
18   </p>
19   <p>Search: <span class="glyphicon glyphicon-search"></span></p>
20 </div>
```

- Output:



Navbars

- Also called as Navigation bars
- A navigation header appears on the top of a Web page
- Collapsible or extensible according to the browser screen size
- Contains – links, drop-downs, buttons, icons, or combination
- Left or right alignment of these elements is possible
- Sets horizontally when viewport width increases
- Syntax:

```
<nav class="navbar navbar-default">
```



Input Groups (1-3)

- Referred as extended form controls
- Easy to append or prefix icons, buttons, or text.
- **.input-group** container class adds help text, button, or an icon.
- **.input-group-addon** class affixes text, icon, or button
- **Form-group** class adds space between controls



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Input Groups (2-3)

- Bootstrap supports following form controls:

Input

Textarea

Radio

Select

Checkbox

- Also supports input types:

Text

Number

Password

Email

Date Time

URL

Search

Color



Input Groups (3-3)

- Syntax for creating text and password input controls:

```
<div class="form-group">  
  <label for="user">Name:</label>  
  <input type="text" class="form-control" id="user">  
</div>  
  
<div class="form-group">  
  <label for="pwd">Password:</label>  
  <input type="password" class="form-control" id="pwd">  
</div>
```

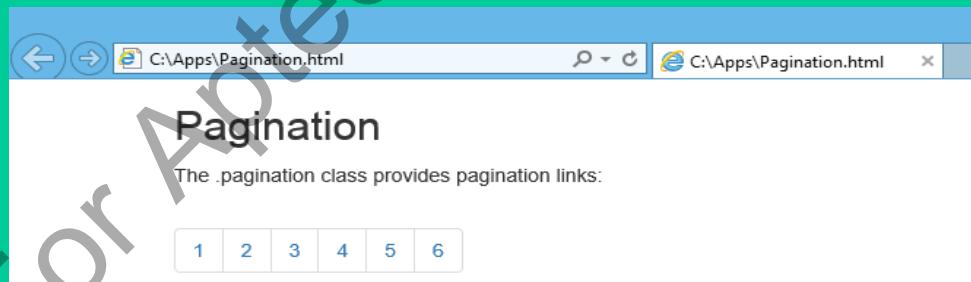


Pagination

- Useful to Websites with many pages
- .pagination class in element should be used to add pagination component
- Code snippet:

```
13 <div class="container">
14   <h2>Pagination</h2>
15   <p>The .pagination class provides pagination links:</p>
16   <ul class="pagination">
17     <li><a href="#">1</a></li>
18     <li><a href="#">2</a></li>
19     <li><a href="#">3</a></li>
20     <li><a href="#">4</a></li>
21     <li><a href="#">5</a></li>
22     <li><a href="#">6</a></li>
23   </ul>
24 </div>
```

- Output:

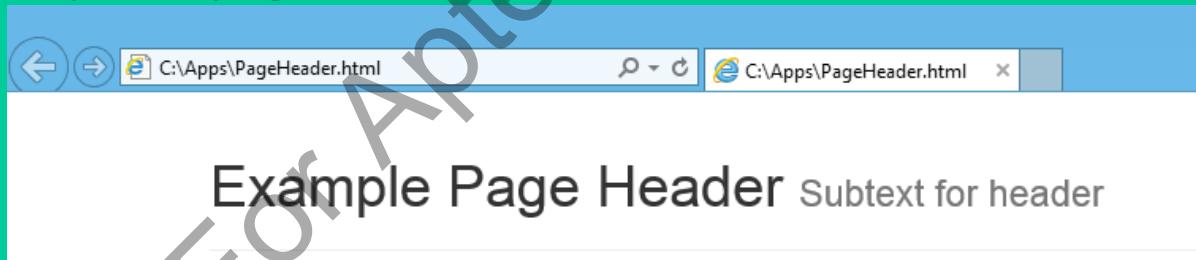


Page Headers

- It is a section splitter
- Add proper spacing to the Webpage headings
- Similar to <H1> tag
- Use .page-header class with <div> element
- Code:

```
13  <div class="page-header">
14    <h1>Example page header <small>Subtext for header</small></h1>
15  </div>
```

- Output of page header

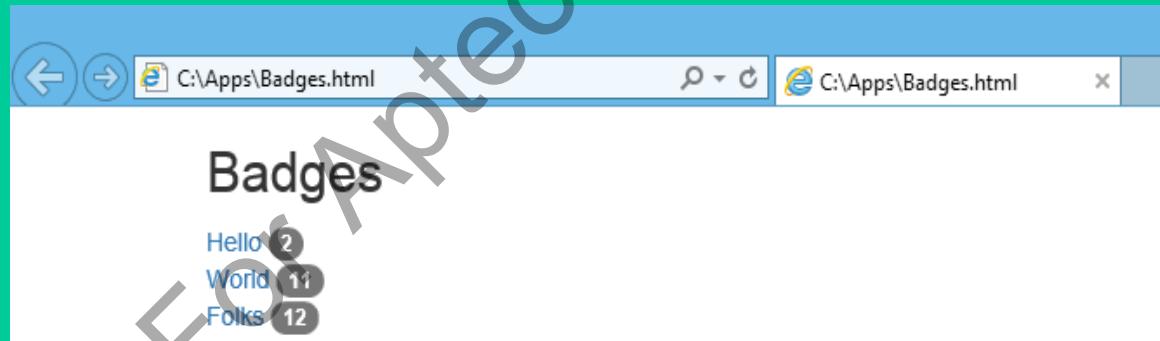


Badges

- Special labels representing new items
- Show numerical values indicating number of items
- Use .badge class with tag
- Code:

```
13 <div class="container">
14   <h2>Badges</h2>
15   <a href="#">Hello <span class="badge">2</span></a><br>
16   <a href="#">World <span class="badge">11</span></a><br>
17   <a href="#">Folks <span class="badge">12</span></a>
18 </div>
```

- Output of a badge

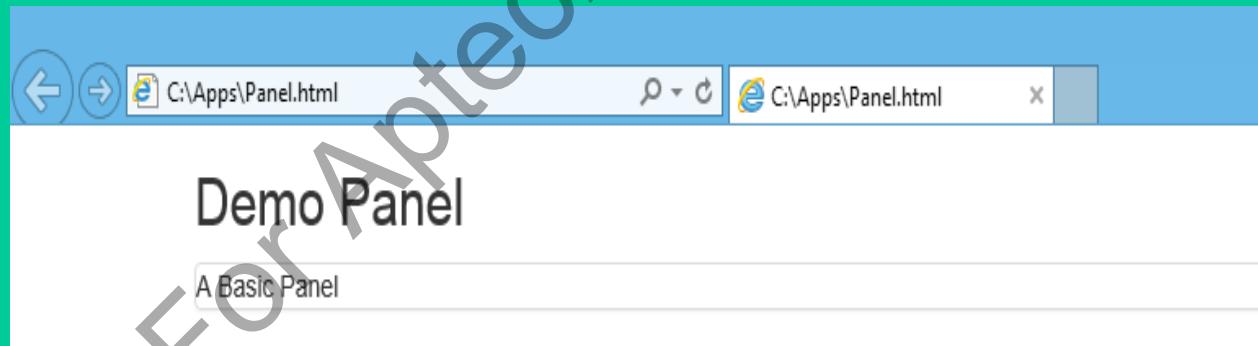


Panels

- A container that holds other components
- Use .panel base class with standard padding and border for creating panel
- Use .panel-body class to place the content
- Code:

```
13 <div class="container">
14   <h2>Demo Panel</h2>
15   <div class="panel panel-default">
16     <div class="panel-body">A Basic Panel</div>
17   </div>
18 </div>
```

- Output of the panels

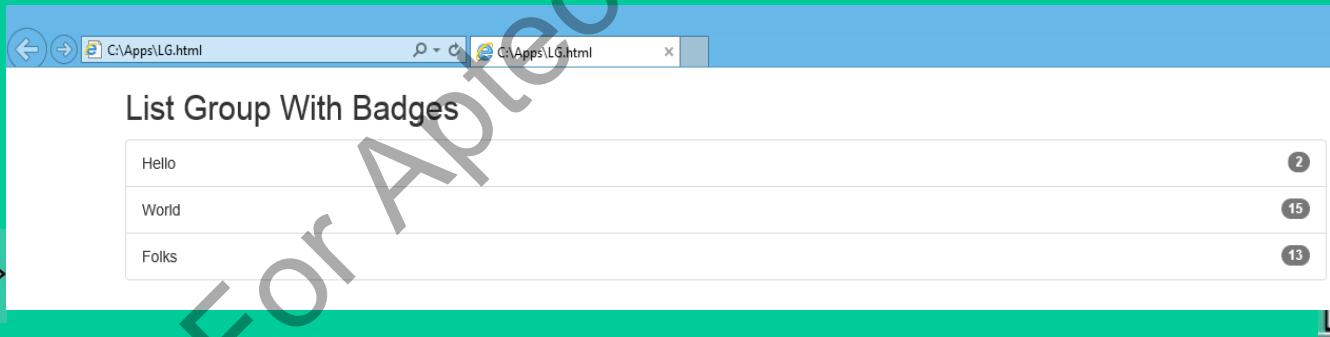


List Groups

- Unordered list of items
- Renders complex and tailored content
- Use .list-group class with tag and .list-group-item class with tag
- Code:

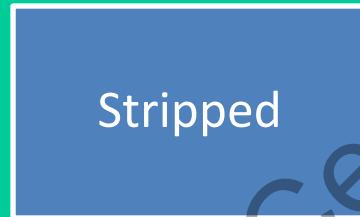
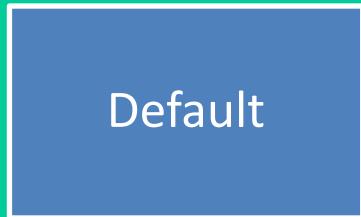
```
13 <div class="container">
14   <h2>List Group With Badges</h2>
15   <ul class="list-group">
16     <li class="list-group-item">Hello <span class="badge">2</span></li>
17     <li class="list-group-item">World <span class="badge">15</span></li>
18     <li class="list-group-item">Folks <span class="badge">13</span></li>
19   </ul>
20 </div>
```

- Output of list groups:

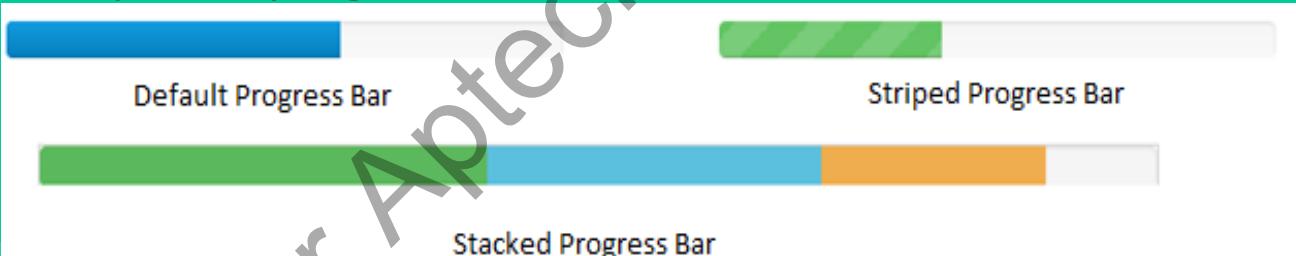


Progress Bars (1-2)

- Display the status of an action or process in progress
- Indicate a feedback or convey an action
- Types of progress bars:



- Examples of progress bars:

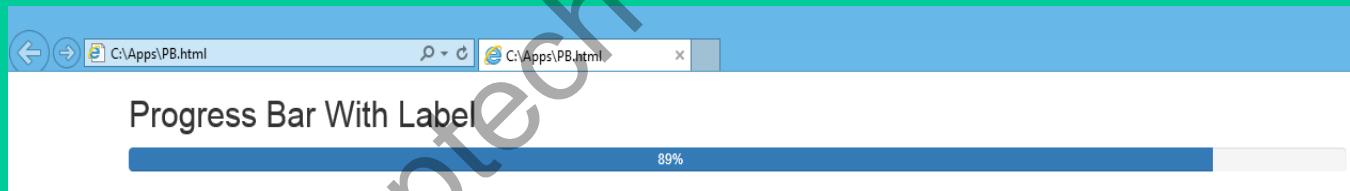


Progress Bars (2-2)

- Use .progress class in <div> tag for generating progress bars.
- Code:

```
13 <div class="container">
14   <h2>Progress Bar With Label</h2>
15   <div class="progress">
16     <div class="progress-bar" role="progressbar"
17       aria-valuemax="100" style="width:89%">
18       89%
19     </div>
20   </div>
21 </div>
```

- Output of a default progress bar:



Programming in Bootstrap (1-2)

- CSS is the core of bootstrap and exists in head section
- JavaScript exists at the end of body section
- Bootstrap consists three main parts:

Bootstrap CSS in the head section

Bootstrap JavaScript at the end of the body

jQuery at the end of the body

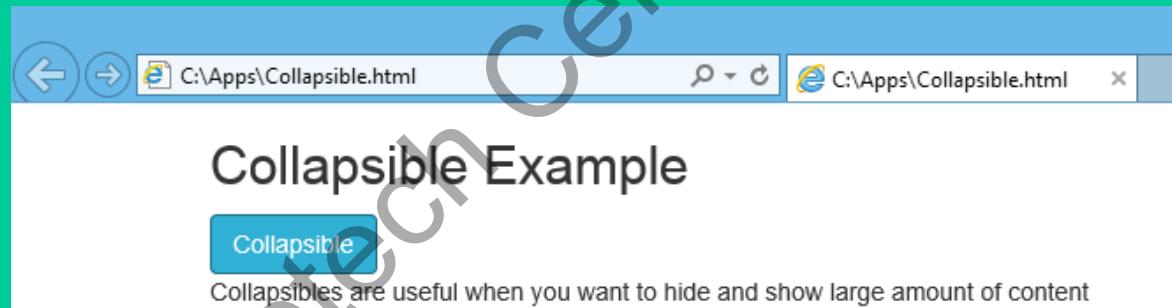


Programming in Bootstrap (2-2)

- Collapsible is used to show or hide content
- Use *collapse* class in <div> tag to add collapsible
- Code for collapsible:

```
<button type="button" class="btn btn-info" data-toggle="collapse" id="mybtn" data-target="#demo">Collapsible</button>
```

- Output of collapsible:



- Collapsible hidden by default



Demo on Bootstrap Functionality

- Bootstrap offers three layouts for forms:

Vertical

Horizontal

Inline

- Include each elements in `<div>` tag using `.form-group` class.
- Use `.form-control` class in `<input>`, `<textarea>`, and `<select>` elements.



Vertical Forms

- A default layout in bootstrap
- Styles are specified without a base class
- Controls are labeled and aligned to left
- Output of vertical form

The screenshot shows a web browser window with the title "Bootstrap Example". The page displays a vertical form with the following fields:

- User Email:
- Password:
- Remember me
-



Inline Forms

- All elements are in line, one after the other, and left aligned
- Width of viewport is 768 pixels
- Suits the screen of the device
- Controls are arranged side-by-side to adjust the layout vertically
- Output of the inline form:

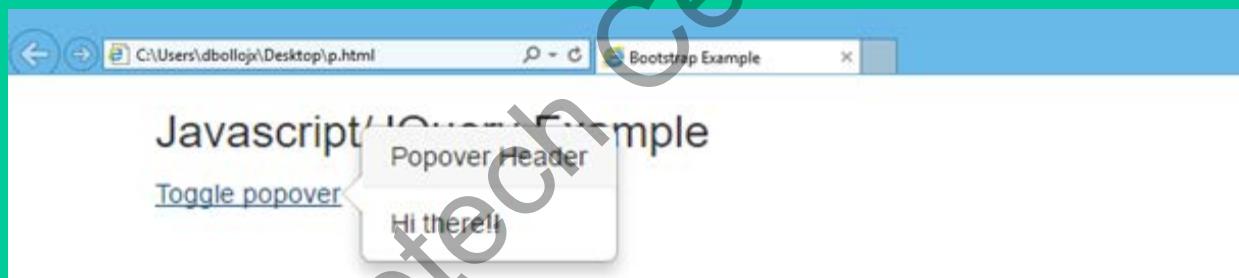
The screenshot shows a web browser window with the following details:

- Address Bar:** C:\Users\dbollojx\Desktop\p.html
- Title Bar:** Bootstrap Example
- Content Area:**
 - Section Header:** **Inline form**
 - Description:** Make the viewport larger than 768px wide to see that all of the form elements are inline, left aligned, and the labels are alongside.
 - Form Elements:**
 - Email:
 - Password:
 - Remember me
 - Submit



Popover

- A pop-up dialog box
- Analogous to a tooltip
- Display much more content
- Not a CSS-only plugin, initialize through jQuery
- Output of the popover:



Summary (1-3)

- Each Bootstrap component is reusable and comprises an HTML structure, CSS code, and even associated JavaScript.
- Bootstrap provides a variety of JavaScript components, which are available as jQuery plugins.
- There are more than 250 glyphs in Bootstrap, which are available in **Glyphicon Halflings** files.
- An icon class is applicable to elements that have neither text nor child elements.
- A navbar is a responsive navigation header visible on the top of a Webpage and is collapsible or extensible.
- Pagination refers to a block of numbers, each indicating a different page of a Website.



Summary (2-3)

- Badges are special labels indicating new items, which is similar to the number of unread e-mails near the Inbox tab in an e-mail account.
- A panel refers to a container that can hold other components such as lists and tables with proper padding.
- A list group renders an unordered list of items as well as complex and tailored content.
- Bootstrap offers four main types of progress bars namely, default, striped, animated, and stacked.
- Programming in Bootstrap includes CSS in the head section and JavaScript/jQuery in the body section.



Summary (3-3)

- The `html5shiv.js` and `respond.min.js` files are included in the Bootstrapped template so that IE 8 can render the HTML5 elements.
- Bootstrap offers three form layouts namely, vertical (default), horizontal, and inline.



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Basics of JQuery

Session 3



Objectives

At the end of this session, you will be able to:

- Explain the basics of jQuery and its usage with Bootstrap
- Outline selectors and functions in jQuery
- Describe JSON and its usage in jQuery
- Explain conversions to JSON
- Describe the concept of event delegation and its usage in jQuery



Introduction

- A lightweight and concise JS library
- Helps to make JS programming easy and faster
- Feature rich and open source library which simplifies complex tasks
- Easy to use API which is compatible with browsers
- Common tasks into built-in methods
- Reduce time in writing lines of code



Benefits of jQuery over JS (1-2)

Unobtrusive JS

- Web page designing through unobtrusive JS
- Separates functionality between presentation and structure of Web page

Lightweight

- Reduced library size is in kilobytes (KB)
- Browser cache the library throughout Websites instead of downloading it

Easy to use

- Simple and robust syntax
- Reduced lines of code
- Library uses CSS3 selector specification

Big and focused library

- Perform variety of functions through single library
- jQuery offers several utility functions



Benefits of jQuery over JS (2-2)

Extensibility

- Plugin framework – third party and official plugins
- Any feature can be included through plugin

Browser Compatibility

- Resolves cross browser issues
- jQuery implemented compatibility code

Strong Community

- Exclusive community where developers improve functionality
- Offers several plugins which accelerate Web development process

AJAX Support

- Creates AJAX templates
- Offers smooth interfaces and efficient loading

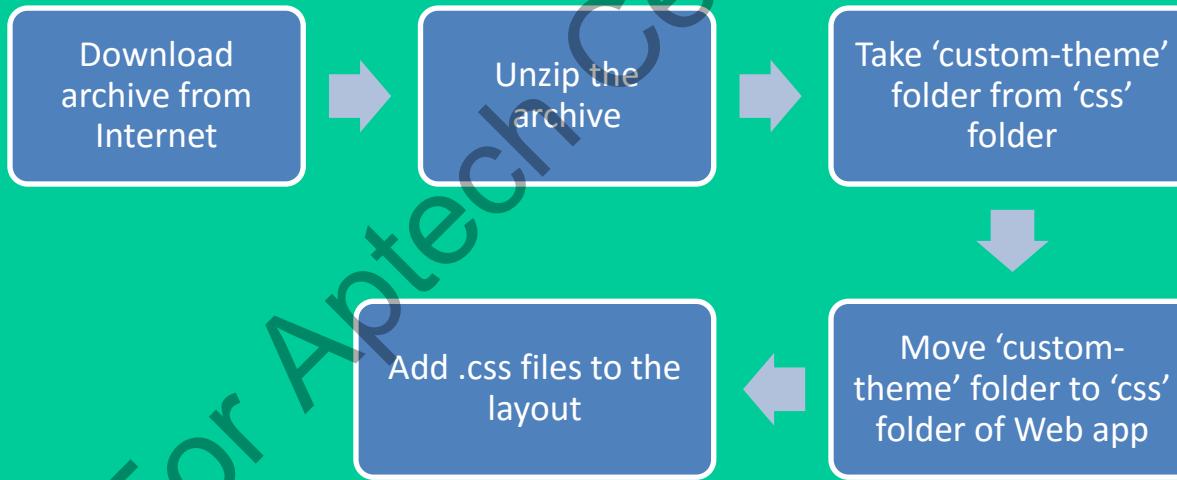
Comprehensive Documentation

- Official website has in-depth documentation and tutorials
- Helps beginners for easy use



Using Bootstrap and jQuery

- jQuery UI Bootstrap theme allows using bootstrap-themed widgets
- Bootstrap and jQuery cannot exists together originally
- New theme was introduced with relevant JS and CSS using jQuery and Bootstrap
- Bootstrap theme for third party widgets
- Steps to use the theme:



Use of jQuery in Web Application

- jQuery library is a JS file
- Used for programming in jQuery to develop Web application
- Two ways to use the file:

Download the library file from jQuery.com and refer it in HTML code and finally, save the downloaded file in the directory

Include the library into the HTML code while referring it to CDN



jQuery Syntax

- Customized syntax:
`$(selector).action()`
- Web developer finds and selects HTML element and triggers desired actions
- jQuery code exists in **document ready** event. Syntax is:
`$(document).ready(function()
{
 //Code jQuery functions here
});`
- Wait for DOM to load fully before requests or responses are handled by HTML pages



jQuery Functions

- Function definition can be done in four ways:

Basic Declaration

- Easy way of declaration
- Used for quick testing
- Not recommended to use

Declaration as a Variable name

- Defining a function through an expression assigned to a variable
- Variable is used as a function

Self-invoking Function Declaration

- Expression where script invokes automatically without being called
- No name and no explicit calls

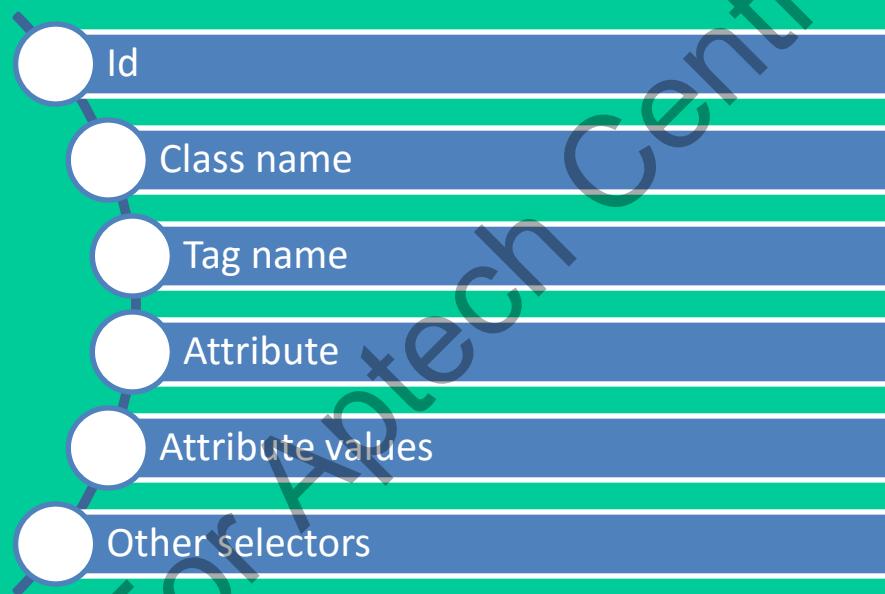
User-defined Function Declaration

- Developers creating own functions
- jQuery.fn or \$.fn creates a user-defined function



jQuery Selectors (1-3)

- A function in the form of expression to search matching element in DOM
- Offers selecting single or multiple HTML elements
- Selectors begin with jQuery identifier (\$) followed by parentheses
- Library allows to access elements by:



jQuery Selectors (2-3)

Id Selector

- Refers to the id attribute of a tag to search relevant element
- Id is unique and used to find single tag at a time
- Document.getElementById() function
- Syntax: \$('#<id>')

Class Selector

- Search HTML elements having specified class
- getElementsByClassName() function
- Syntax: \$('.<class>')



jQuery Selectors (3-3)

Element Selector

- Access elements as per name
- Specify element selector within parentheses followed with \$ character
- Syntax is: \$(<element>)

Checked Selector

- Access and select all selected radio buttons and checkboxes
- Specify :checked in double quotes within parentheses followed by \$ character
- Syntax is: \$(":checked")



JSON and Conversions to JSON

- It is a lightweight format used for exchanging and storing data
- Alternate to eXtensible Markup Language (XML)
- Data exchanged between a server and a client
- Exchange in simple text format
- Independent of programming language
- Convert an object into JSON and send it to the server or vice versa
- Free from complex parsing



Creating JSON Objects

- Similar to JS objects
- Written in the form of key/value or name/value pairs
- Name is in double quotes and is separated by value with a colon
- Syntax: {"name":value}



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Data Access from JSON Object

- Use dot (.) notation and corresponding property name
- Syntax: <Object>.<propertyName>;
- Example: var firstName = employeeJSON.firstName;
- JSON object is created when document is loaded



Using JSON Arrays

- JSON arrays hold several objects
- To store the data of more than one employee in JSON object
- Include objects in square brackets separated by comma (,) notation
- Example of JSON array holding colors of rainbow:

```
[ "Red", "Blue", "Green", "Yellow", "Violet", "Indigo", "Orange" ]
```



Converting String to JSON Object

- Parse a string using `JSON.parse()`
- Convert string into JSON object or an array
- String should be used in JSON format to avoid errors



Event Delegation in jQuery (1-2)

- Event is an exact moment when an action is performed by a user
- Designing of dynamic Web pages
- Event listener listens to the raised event which is associated with source of event
- Event handler is a custom function that conveys for handling an event
- Event delegation assigns single listener to a parent element
- On() and delegate() methods enables event delegation



Event Delegation in jQuery (2-2)

- Main features are – event bubbling and target property
- Boost performance
- Target property is the element that originated the event
- Benefits of event delegation:



Less handler to take up memory



Better performance



Reduced risk of crashing



No re-assigning handlers



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Summary (1-3)

- jQuery is a lightweight, open-source JS library that makes JS programming easier and more efficient.
- jQuery uses unobtrusive JS, offers a variety of reusable functions, is extensible, and is compatible with modern browsers.
- Web developers can either download the jQuery file or include it by referring to a CDN for using jQuery in their Web applications.
- The customized syntax of jQuery is `$(selector).action()`.
- There are four ways of declaring a function in jQuery, which are basic, as a variable, self-invoking, and user-defined.



Summary (2-3)

- A jQuery Selector refers to a function in the form of an expression for searching the matching element in the DOM.
- The jQuery library allows selecting the HTML elements by ID, class name, tag name, attribute, and attributed values.
- JSON is a lightweight format for exchanging and storing data as well as an easier alternative to XML.
- Unlike in JS, the key or name in JSON is always a string.
- Each name/value pair in JSON format is referred to as a property.
- A JSON object is a collection of properties, each separated by a colon.



Summary (3-3)

- The JSON.stringify() method converts a JSON object into a JSON string.
- The JSON.parse() method converts a JSON string into a JSON object or array.
- Event delegation allows assigning a single listener to a parent element, which will listen for all descendants corresponding to a selector.
- The on() and delegate() methods facilitate delegating an event in jQuery.
- Event bubbling in which an event bubbles upwards from the source element in the DOM tree.
- Event bubbling and target property are the main features of event delegation.





Functions, Widgets, Plugins in jQuery

Session 4



Objectives

At the end of this session, you will be able to:

- Describe various types of functions in jQuery
- Explain use of AJAX in jQuery
- Elucidate the callback concept in jQuery
- Describe implementation and use of various controls such as widgets and datatables in jQuery



For Aptech Centre Use Only



Built-in Methods in jQuery (1-4)

- jQuery framework contains different skills of JS
- The built-in jQuery methods are:

charAt()

- Fetches the character at the mentioned index

Concat()

- Returns a new string by combining two strings

indexOf()

- Fetches the index inside the requesting string object of the initial occurrence of the mentioned value
- If nothing is found, it returns -1



Built-in Methods in jQuery (2-4)

length()

- Returns the number of characters in a string

forEach()

- Invokes a function for each array element

Push()

- Appends single or multiple elements at the end of an array and fetches its modified length



Built-in Methods in jQuery (3-4)

pop()

- Removes and returns the last array element

subStr()

- Extracts the string characters starting at the mentioned index location until the specified index length

reverse()

- Changes the order of array elements by making the first one last and the last one first



Built-in Methods in jQuery (4-4)

sort()

- Arranges the array elements in an ascending or descending order

toLowerCase()

- Converts a string value into lower case

toUpperCase()

- Converts a string value into upper case

toString()

- Converts a given value into a string



Live Function in jQuery

- Live() function delegates single or multiple event handlers
- Another way of event delegation performs in jQuery
- Promote the use of DOM
- The die() method is used to remove associated event handler
- Syntax:

```
$(selector).live(event,data,function);
```
- On() method takes care of all event delegation task as well as live() method tasks



jQuery AJAX

- Update parts of Webpage by exchanging data between server and client
- Without reloading or refreshing Webpage
- Examples – Gmail and YouTube
- AJAX code without jQuery is complex
- jQuery provides AJAX methods to develop Web applications
- Request data from server via GET and POST
- Data request in four formats:

Text

XML

JSON

HTML



AJAX jQuery Load() Method

- Easy and robust method
- Loads the requested data from Web server and inserts into element
- Syntax:

```
$(selector).load(URL,data,callback);
```



Callbacks

- Runs once when current jQuery effect is over
- Line by line execution in JavaScript, lead to errors
- Syntax:

```
$(selector).hide(speed,callback);
```

- Effects are – hide, fade, or slide
- In load() optional callback parameter can be callback function
- Syntax:

```
$(selector).load(URL,data,function(response,status,XHR));
```



jQuery \$.get() Method (1-2)

- Gets data of a resource from a Web server via GET request
- Syntax:

```
$.get(URL,callback);
```

- Takes two parameters: URL and callback function
- Callback function contains data and status of the request



jQuery \$.get() Method (2-2)

Point of Distinction	Load()	\$.get()
Functional ity	Loads only HTML data.	Loads any type of data, such as JSON and script.
Type of HTTP Request	Sends a GET or POST request. If data parameter is specified, POST is used. Otherwise, GET is used.	Sends a GET request always.
Selector Usage	Follows a selector for inserting the retrieved content into the element that matches with the selector. For example: <code>\$(selector).load('url', 'data');</code>	Does not follow a selector while coding. Instead, it invokes a callback function to insert the data from the server. For example: <code>\$.get('url', 'data', function (response) { \$(selector).html(response); });</code>



jQuery \$.post() Function

- Changes the data of a resource on a Web server via POST request
- Syntax:

```
$.post(URL,data,callback);
```
- Three parameters – URL, data, and callback function



\$.get() and \$.post() Functions

Point of Distinction	\$.get()	\$.post()
Functionality	Obtaining of data from a Web server although it can send data.	Changing of data on a Web server although it can send data.
Caching	Is capable of caching the requested data and returning it.	Does not cache data.
Method of Sending Data	Appends data to the URL as a query string.	Includes the data in the message body.
Limitation on Data to Be Sent	Puts a limit on the amount of data to be sent because of the limit on the length of the data passed to an URL..	Has no such limitation.



Autocomplete Function (1-2)

- Offers a list of suggestions to select a value instead of typing it
- Functions similar to a drop-down list
- Filters the options matching as the user types into a control
- jQuery UI stands for jQuery user interface
- A robust open-source JS library based on jQuery framework
- Provide a collection of jQuery plugins
- Download jQuery UI files from Website or use a CDN to refer the files



Autocomplete Function (2-2)

- Library offers autocomplete() function

- Syntax:

```
$ (selector, context).autocomplete (opt);
```

- More than one option can be included

- Syntax:

```
$(selector, context).autocomplete({opt1: val1, opt2: val2.....});
```

- Different options are:

appendTo

source

delay

miniLength

Autofocus

disabled

position



Widgets (1-2)

- An object associated with a HTML element to handle many aspects
- Aspects are:



- Widget is the visual section of jQuery user interface
- Come from jQuery UI and used for interactive designing of Webpages
- Special plugins which used to apply functionality to associated elements



Widgets (2-2)

- jQuery widgets are:

Accordions

Buttons

Tabs

Sliders

Autocomplete

Dialogs

Datepickers

Progress bars

Menus

Spinners

Tooltip



Tooltip Widget

- Facilitates customization and provides fresh themes
- Allows to display other content apart from title attribute
- Customization of alignment of tooltip
- Used to indicate a warning or error
- Syntax:

```
$(selector, context).tooltip(opt);
```

```
$(selector, context).tooltip({opt1: val1, opt2: val2.....});
```

- Parameters of tooltip():

Content

Item

disabled

hide

Show

Track

Position

tooltipClass



Dialog Widget

- Floating window having title and a body with content
- Moveable and resizable window
- Dynamic window to display scrollbar
- jQuery offers dialog() method
- Syntax:

```
$(selector, context).dialog(opt);
```

```
$(selector, context).dialog({opt1: val1, opt2: val2.....});
```

- Parameters of dialog() method:

Title

autoOpen

closeOnEscape

Buttons

Draggable

Resizable

Modal

position



Datatable Plugin

- An intuitive jQuery plugin that adds additional functionality to <table> element
- Dynamic table including pagination, sorting, and searching functionalities
- Quick data access and user friendly interaction
- Syntax:

```
$(selector).dataTable();
```

- Include two additional files: DataTables JS files and DataTables CSS files
- Either download files from Website or refer to CDN



Summary (1-3)

- Built-in functions are methods that allow manipulating data values such as dates, numbers, and strings.
- The live() method delegates event handlers to existing and future elements that match with the selector.
- The jQuery AJAX methods allow requesting data from a distant Web server via LOAD, GET, and POST in different formats and load the same into the desired HTML element.
- A callback function runs once the current jQuery effect is over.



Summary (2-3)

- The `$.get()` method asks data of a resource from a Web server through a GET request.
- The `$.post()` method asks data of a resource from a Web server through a POST request.
- The jQuery UI library offers the `autocomplete()` method to implement the autocomplete plugin.
- A widget refers to an object associated with an element on a Webpage for handling the lifespan, interaction, state, and inheritance and other aspects with other JS objects or widgets.



Summary (3-3)

- The jQuery UI widgets are special plugins that simplify the task of applying functionality to their associated elements and offering some capabilities lacking in standard jQuery plugins.
- The Datatable jQuery plugin makes a plain HTML table dynamic by easily including the pagination, sorting, and searching utilities in it.





Creating Bootstrap Responsive Layout

Session 5



Objectives

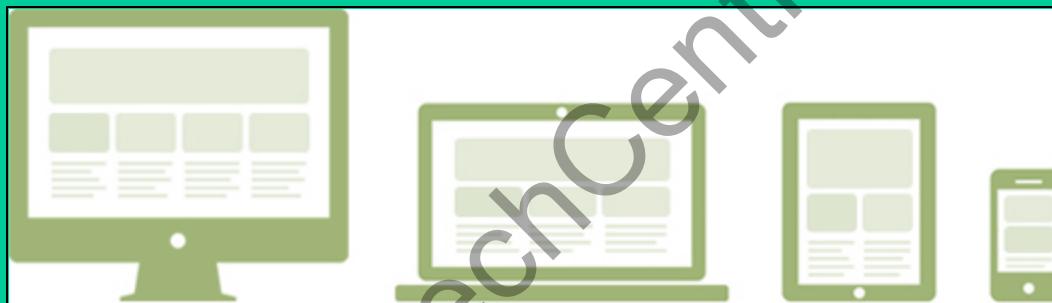
At the end of this session, you will be able to:

- Describe how bootstrap helps in achieving responsiveness
- Explain the grid system
- Outline the use of Jumbotron component
- Describe the use of various typography classes
- Describe creation of simple responsiveness pages with Bootstrap



Bootstrap Responsive Layout (1-2)

- A design process for easy access and smooth view
- Efficient way to display Website on different devices
- Responsive layout is adaptive to UI components
- Screen for devices – laptop, desktop, smartphone, or tablets



- Effortless navigation with minimal resizing, scrolling, and rotating



Bootstrap Responsive Layout (2-2)

- Responsive Website uses three elements:
 - Fluid, proportion-based grids
 - Flexible or fluid images
 - CSS3 media queries
- Grids and multimedia should be fluid and flexible
- Fluid grid handles sizing of page elements in percentage (not in pixels)
- Bootstrap code focuses on small screens first and then it expands for larger screens
- Version 3 has four classes of grids



Working with Grids

- A collection of HTML/CSS components
- Robust mobile-first grid system
- Allows defining rows and columns having content in resulting boxes
- Create up to 12 columns and unlimited rows, known as 12-grid system or 12-column layout

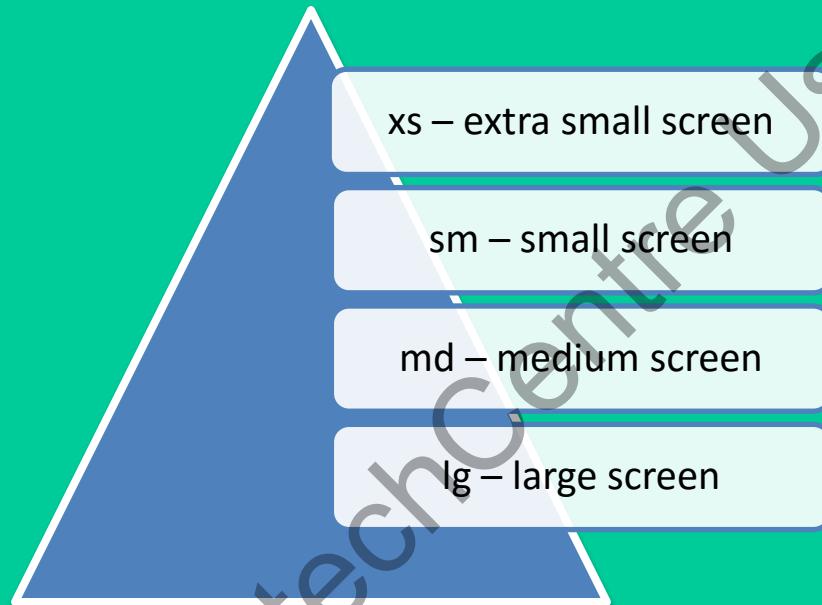
span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1				
span 4				span 4				span 4							
span 4				span 8											
span 6						span 6									
span 12															

- Consists of series of containers, rows, and columns



Predefined Grid Classes (1-2)

- Four classes forming four tiers of grid system



- Use one or more classes for dynamic and fluid design layout



Predefined Grid Classes (2-2)

- Column specification for different browser sizes

Column Definition	Browser of Target Device	Browser Size
.col-lg-*	Large devices (desktops)	1200 pixels and up
.col-md-*	Medium devices (desktops)	992 pixels and up
.col-sm-*	Small devices (tablets)	768 pixels and up
.col-xs-*	Extra small (mobile phones)	< 768 pixels

- Symbol * denotes the number of columns a row should have
- For example, to define column as four out of 14 in one row, specification will be .col-xs-4



Rule of Grid System

- Contents of containers to be middle-aligned
- Place the rows within a container for proper aligning and padding
- Columns have gaps between its content, known as gutters
- Columns contain content and are only direct children of rows
- Grid tiers depend on minimum widths
- Predefined grid classes for rows and columns make quick grid layouts
- Predefined grid classes for column indicate type of device and number of columns



Basic Structure of Grid

- Grid structure has one or more containers, rows, and columns
- Define a container containing rows and columns
- First, define rows within container, using .row class
- Then, define columns within row, using .col-xs-*, .col-sm-*, .col-md-*, and .col-lg-* classes.
- Finally, these columns can contain content



Grids for Device

- Grid layout differs with devices
- Columns are divided in a row according to size of device
- Four types of grid:

Stacked

- Also known as horizontal grid
- Load as a stack first on small screen sized devices

Small Devices

- Screen width between 768 and 991 pixels
- Use .col-sm-* classes

Medium Devices

- Screen width between 992 and 1199 pixels
- Use .col-md-* classes

Large Devices

- Screen width is at least 1200 pixels
- Use .col-lg-* classes



Working with Headers (1-2)

- Page header layout adds header to a page
- Separates rest of the page by inserting a horizontal line under heading
- Jumbotron is a flexible and lightweight component
- Extends the whole viewport to highlight key informative content
- Use .jumbotron class in <div> element
- Two ways of using this component:

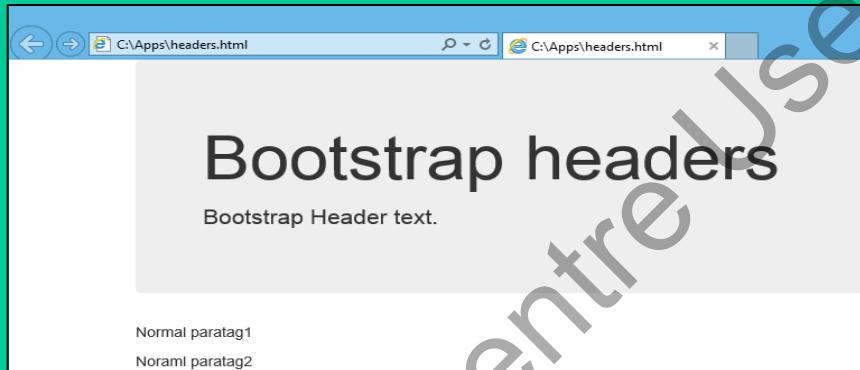
Insert it inside <div class="container"> to prevent from extending up to screen edges

Insert it outside <div class="container"> to extend it up to screen edges

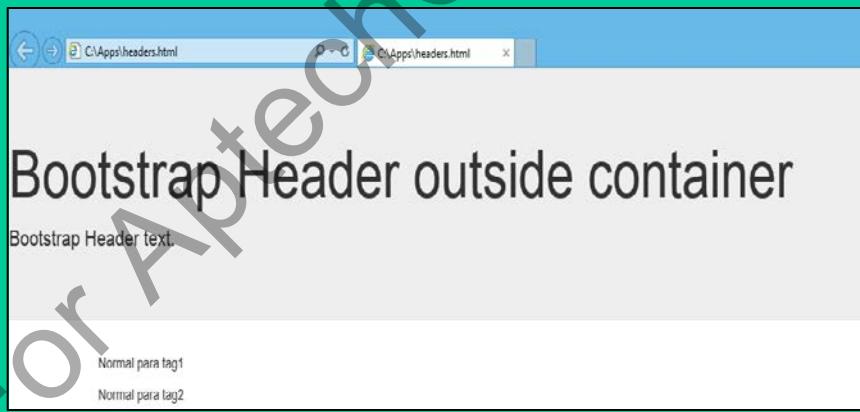


Working with Headers (2-2)

- Output of Jumbotron inside <div>

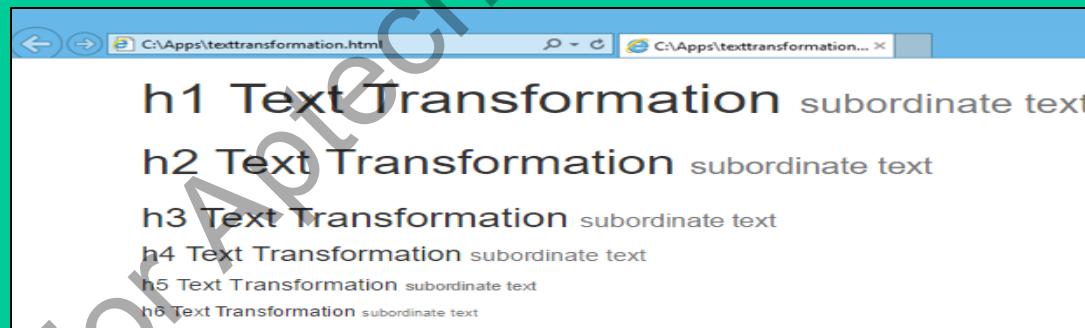


- Output of Jumbotron outside <div>



Typography (1-2)

- Typography classes and elements are used to style HTML elements on Webpages
- Typography classes can be applied to text in heading, body, and list
- HTML headings have .h1 to .h6 classes
- Used to match heading font's style and put inline text
- Use .small class for inline sub-heading to display secondary text in smaller size and light color
- Output:



Typography (2-2)

- Bootstrap offers styles for Description list `<dl>`, inline code snippet `<code>`, and keyboard input text `<kbd>`.
- Output:

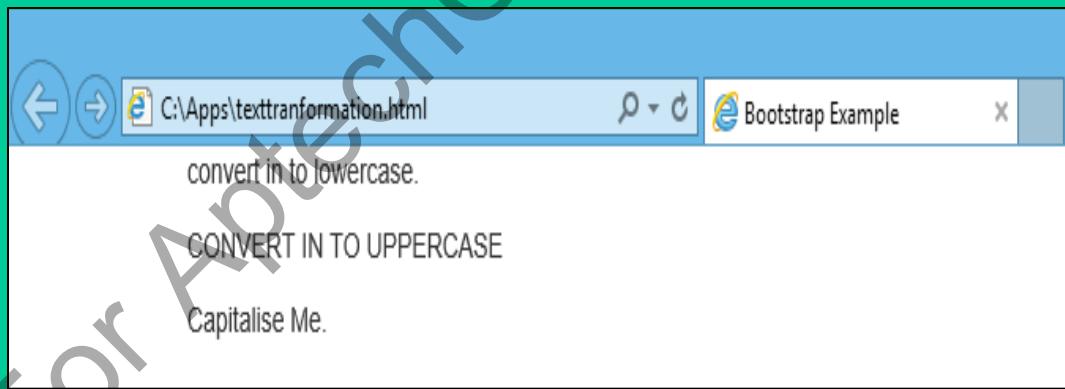
The screenshot shows a web browser window with two tabs, both titled "C:\Apps\Styling.html". The main content area displays three sections: "Description Listing", "Keyboard Inputs", and "Code Highlighting".

- Description Listing:** Shows a list item for "India" followed by a definition "- A country" and another list item for "Asia" followed by "- A Continent".
- Keyboard Inputs:** Contains the text "To show which control is to be entered through keyboard, place them in kbd tag" and "Use `ctrl + z` to undo".
- Code Highlighting:** Contains the text "Code elements which are to be highlighted, place them in code tag" and "The following oops attributes: `class`, `variable`, and `dynamic` specifies keyword in Java, C#".



Text Transformation Classes

- Three text transformation classes to change the text case in component:
 - .text-uppercase
 - .text-lowercase
 - .text-capitalize
- Output:



Responsive Web Designing

- The .clearfix class is used to prevent uneven wrapping and organizes the content
- The .visible-sm class is a responsive utility to make content visible on small devices
- The .visible-sm-block class is used to show content through media queries
- Use one or more classes to toggle content across variety of viewport



breakpoints



Summary (1-3)

- A responsive layout adapts its user interface components and perhaps even functionality to any screen size on its own.
- A responsive Website adapts its layout to the viewing screen using three elements namely, fluid grids, flexible multimedia, and CSS3 media queries.
- Bootstrap 3 mobile first technology allows the code to focus first on smaller screens and then, expand for fitting on larger screens.
- A grid in Bootstrap is a collection of HTML/CSS components that enable a Web developer to structure a Website and insert its contents easily in the intended locations.



Summary (2-3)

- Bootstrap provides only up to 12 columns for a Webpage regardless of the viewport, but can have unlimited rows.
- The grid system consists of a series of containers, rows, and columns for designing a layout and aligning its content. The container element covers the content by setting the margins on the left and right.
- Bootstrap offers four predefined classes namely, xs, sm, md, and lg for designing responsive layouts quickly as per the targeted devices.
- The jumbotron component allows increasing the size of heading and other text for grabbing quick attention of visitors.



Summary (3-3)

- Inserting jumbotron inside a <div> tag prevents it to extend up to the edges of the screen, while placing it outside extends it up to the edges.
- Bootstrap offers .h1 to .h6 classes for styling heading text and accommodating inline text.
- Bootstrap provides .text-uppercase, .text-lowercase, and .text-capitalize classes for transforming the case of words in any piece of text.





Creating Responsive Webpages Using Bootstrap and jQuery

Session 6



Objectives

At the end of this session, you will be able to:

- Describe the role of media queries in achieving responsiveness in Bootstrap
- Understand the use tables in Bootstrap
- Understand the use tabs in a well in Bootstrap
- Describe how to customize Bootstrap
- Explain how to create a Website using Bootstrap and jQuery



Roles of Media Queries (1-2)

- Media query is a style rule for displaying Website on a particular device type
- Adds responsive CSS to bootstrap application
- CSS2 – computer screens, TV-type gadgets, handheld devices, and printers
- CSS3 – focus on characteristics of target devices rather on type
- Physical properties of device type:

Width and height
of viewport and
device

Screen resolution

Orientation –
portrait, or
landscape

- Device specific style sheet
- Defines breakpoint for width of media where layout changes visibly



Roles of Media Queries (2-2)

- Bootstrap defines media queries in bootstrapresponsive.css file
- Folder structure: **Assets** folder>> **CSS** folder>> **bootstrapresponsive.css** file
- File specifies breakpoints in a grid system
- Breakpoint on mobile:



- Contains *@media* attribute with width-based logical expression
- Returns true when matches, otherwise returns false
- Include styles for different devices in a single Webpage



Tables (1-2)

- Displays data in a grid layout
- Contains rows and columns
- Provides built-in classes to improve appearance
- Basic table has – horizontal splitters and slight padding of 8 pixels
- Basic bootstrap table:



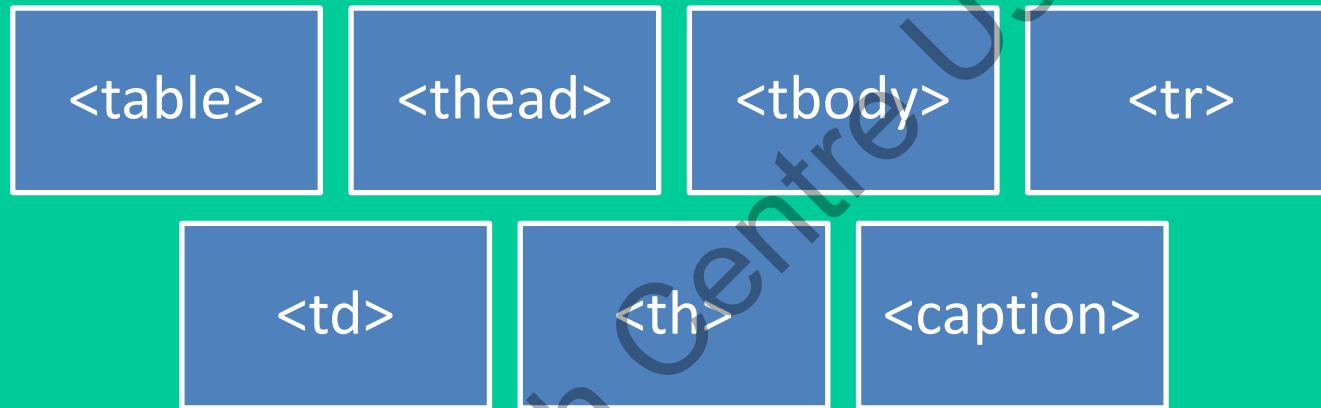
The screenshot shows a web browser window with the title bar "C:\Apps\Tables.html". The main content area displays a table with the following data:

Firstname	Lastname	city
Stella	Mark	smark@example.com
Josie	Fernandes	josief@example.com
Jack	Doe	jdoe@example.com



Tables (2-2)

- Bootstrap provides a clean layout to create a table
- Table elements are:

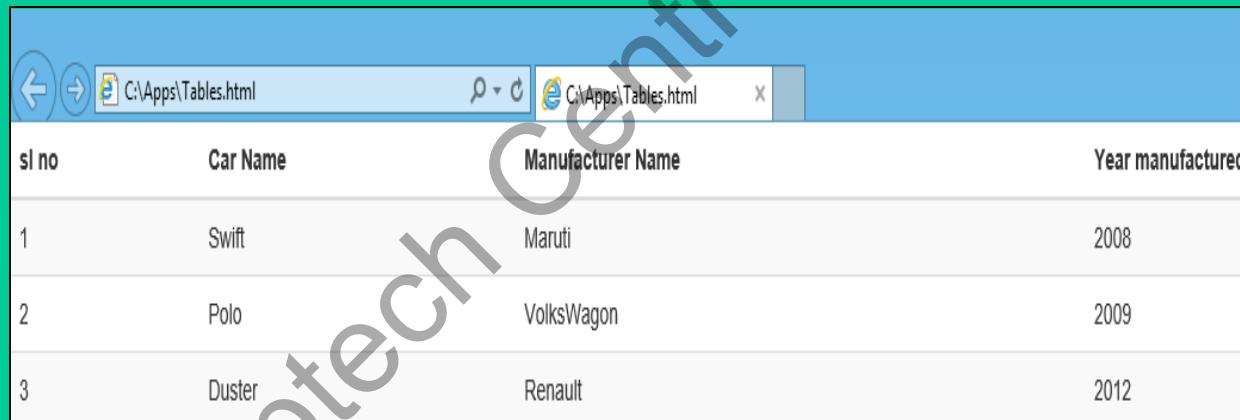


- Standard order of tags: <table>, <tbody>, <tr>, <td>
- Order of column headers: <thead>, <tr>, <th>



Striped Rows

- Table can be created with alternate rows and alternate background color.
- Appearance of zebra strips
- Use `.table-striped` class and add to `.table` base class
- Output:



A screenshot of a web browser window titled "C:\Apps\Tables.html". The browser interface includes standard controls like back, forward, and search. The main content area displays a table with four columns: "sl no", "Car Name", "Manufacturer Name", and "Year manufactured". The table has three rows of data. The first row (odd) has a light blue background, while the second and third rows (even) have white backgrounds. The data is as follows:

sl no	Car Name	Manufacturer Name	Year manufactured
1	Swift	Maruti	2008
2	Polo	VolksWagon	2009
3	Duster	Renault	2012



Bordered Table

- Enable borders on all sides of table
- By default only horizontal dividers are enabled
- Use *.table-bordered* class and add to *.table* base class
- Output:

Bordered Table

Firstname	Lastname	Email
Stella	Mark	smark@example.com
Josie	Fernandes	josief@example.com
Jack	Doe	jdoe@example.com



Hover Effects on Rows

- Apply hover effects on rows of the table
- When hover effect is applied for row, row color changes when user moves mouse on a particular row
- Use .table-hover class and add to .table base class
- Output:

Hover Effect on a Table		
Firstname	Lastname	Email
Stella	Mark	smark@example.com
Josie	Fernandes	josief@example.com
Jack	Doe	jdoe@example.com



Condensed Tables

- Also known as compact tables
- Reduce cell padding by half to make condensed table
- Saves spaces around cells
- Use .table-condensed class and add to .table base class
- Output:

Compact Table

Firstname	Lastname	Email
Stella	Mark	smark@example.com
Josie	Fernandes	josief@example.com
Jack	Doe	jdoe@example.com



Emphasis on Tables

- Few contextual classes to emphasize a cell or entire row
- Indicate success, warning, information, or danger by changing the background color of the row or cell
- List of contextual classes with color:

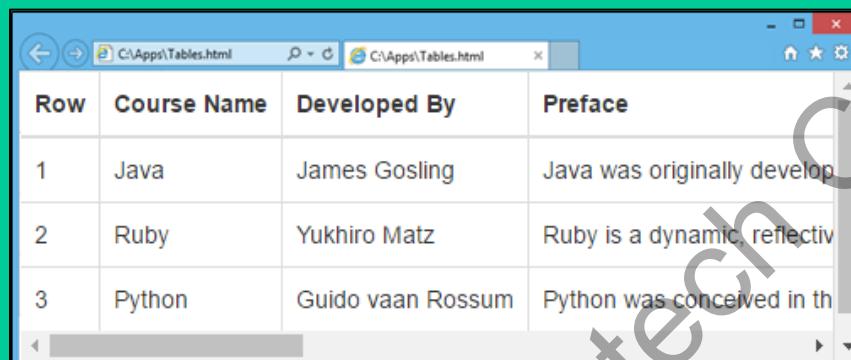
Contextual Class	Background Color	Description
.active	Gray	Applies the hover color to a cell or row.
.success	Green	Denotes a successful action.
.info	Blue	Denotes informative text or neutral action.
.warning	Yellow	Denotes a warning to grab quick attention.
.danger	Red	Denotes a harmful action.

- Use classes .warning, .success, .danger, .active, .info to .table base class.



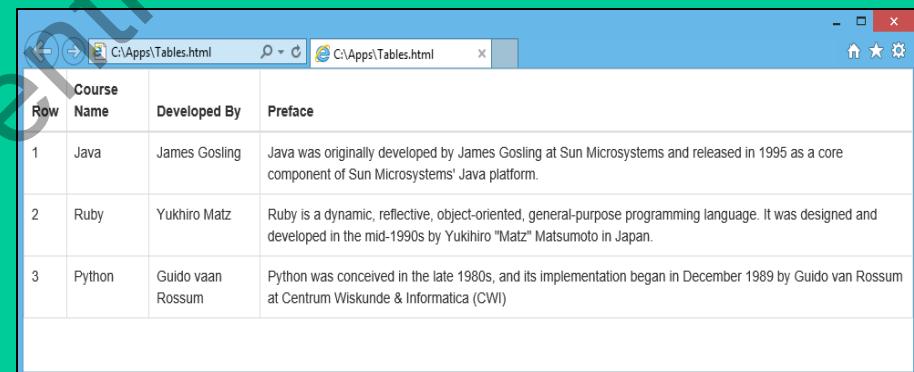
Responsive Tables

- Bootstrap 3 activates horizontal scrolling on small devices
- Same table on larger screens have no difference
- Use .table-responsive class
- Output of responsive table on small screen and larger screen:



A screenshot of a Microsoft Edge browser window displaying a table. The table has four columns: Row, Course Name, Developed By, and Preface. The rows contain data for Java, Ruby, and Python. The 'Preface' column for Java and Ruby is truncated, indicating horizontal scrolling is required to view the full content.

Row	Course Name	Developed By	Preface
1	Java	James Gosling	Java was originally developed by James Gosling at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform.
2	Ruby	Yukhiro Matz	Ruby is a dynamic, reflective, object-oriented, general-purpose programming language. It was designed and developed in the mid-1990s by Yukhiro "Matz" Matsumoto in Japan.
3	Python	Guido van Rossum	Python was conceived in the late 1980s, and its implementation began in December 1989 by Guido van Rossum at Centrum Wiskunde & Informatica (CWI)



A screenshot of a Microsoft Edge browser window displaying the same table on a larger screen. The table is fully visible without any horizontal scrolling, showing all the details for Java, Ruby, and Python.

Row	Course Name	Developed By	Preface
1	Java	James Gosling	Java was originally developed by James Gosling at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform.
2	Ruby	Yukhiro Matz	Ruby is a dynamic, reflective, object-oriented, general-purpose programming language. It was designed and developed in the mid-1990s by Yukhiro "Matz" Matsumoto in Japan.
3	Python	Guido van Rossum	Python was conceived in the late 1980s, and its implementation began in December 1989 by Guido van Rossum at Centrum Wiskunde & Informatica (CWI)



Customizing Bootstrap

- Twitter bootstrap is a popular CSS framework
- Official Website offers custom builder to generate personal bootstrap package
- LESS and SASS versions for compiling CSS file
- Prevents deviation from normal workflow and provide hassle-free upgradation
- Output:



Row	Course Name	Developed By	Preface
1	Java	James Gosling	Java was originally developed by James Gosling at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform.
2	Ruby	Yukhiro Matz	Ruby is a dynamic, reflective, object-oriented, general-purpose programming language. It was designed and developed in the mid-1990s by Yukhiro "Matz" Matsumoto in Japan.
3	Python	Guido van Rossum	Python was conceived in the late 1980s, and its implementation began in December 1989 by Guido van Rossum at Centrum Wiskunde & Informatica (CWI)



Bootstrap Wells

- A well is a container component for applying an inset style
- Used to insert content inside a box
- Put content inside <div> using .well class
- Rounded border with padding and grey background color
- Change the size of well by controlling its padding by using two modifier class .well-lg and .well-sm
- Render a well smaller or larger as per defined base class
- Output of smaller, default, and larger well:

SMALL WELL with reduced padding and radius

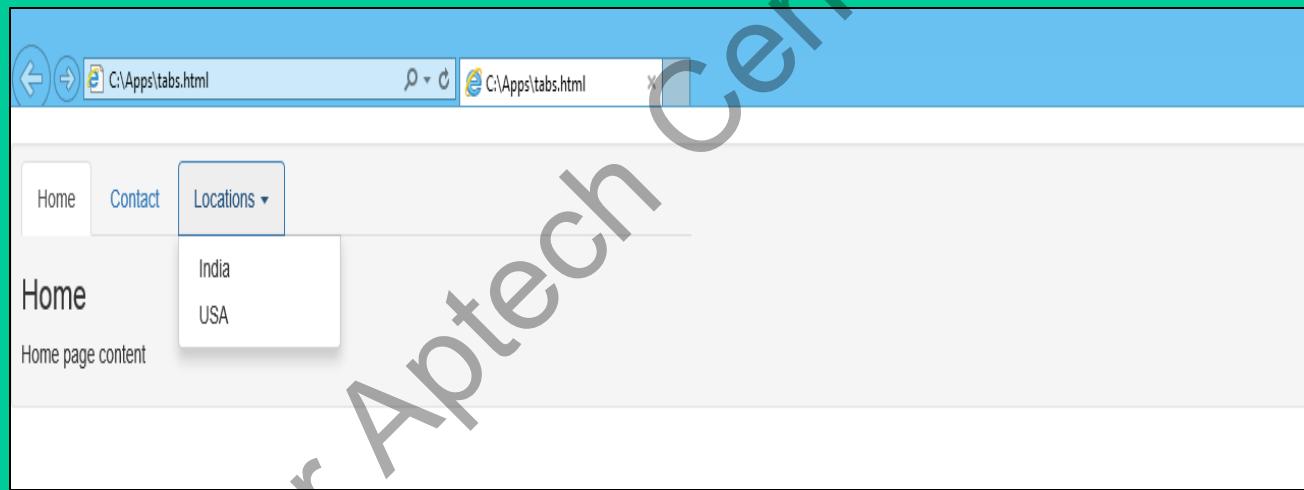
DEFAULT WELL with default padding and radius

A LARGE WELL with increased padding and radius



Tabs in Bootstrap Well

- Offers tabbed interface in a well
- Contains a series of tabs, drop-down menus, or both
- Use .nav-tabs class and add to .nav base class in tag
- Output:



Building a Website

- jQuery with bootstrap used to design robust and dynamic Webpages
- Simple to use and quick to design
- Compatible to multiple browsers
- Bootstrap include containers, form, or form controls in a Webpage
- jQuery provides functionalities to these components



Summary (1-3)

- A media query defines styles for displaying a Webpage on a specific type of device without modifying the markups.
- Media queries are useful in determining the device's physical properties namely, viewport's and device's width and height, screen resolution, and orientation.
- Media queries define the breakpoint for the media's width from where the layout changes on a specific screen.
- Web developers can define device-specific style sheets in Bootstrap and include all in a single Webpage.



Summary (2-3)

- A basic Bootstrap table features distinct appearance in terms of only horizontal splitters and slight padding of 8 pixels.
- A Bootstrap table can have striped rows, borders on all sides, a hovering effect on rows, and emphasized effect on rows or cells.
- The emphasized effect on rows and cells comes from one or more contextual classes namely .active, .success, .info, .danger, and .warning.
- Bootstrap 3 activates horizontal scrolling on a small device whose screen width is not more than 768 pixels.



Summary (3-3)

- Instead of messing up with the core files, it is more efficient to override the default CSS file in Bootstrap.
- A well is a container component to apply an inset style to a block-level element or sunken effect to its content.
- It is also possible to change the well's size by controlling its padding through the modifier classes.

