

Developing Responsive Websites with Bootstrap and jQuery

For Aptech Centre Use Only

Developing Responsive Websites with Bootstrap and jQuery

Trainer's Guide

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APTECH LIMITED

Contact E-mail: ov-support@onlinevarsity.com

First Edition - 2017



Dear Learner,

We congratulate you on your decision to pursue an Aptech Worldwide course.

Aptech Ltd. designs its courses using a sound instructional design model – from conceptualization to execution, incorporating the following key aspects:

➤ **Scanning the user system and needs assessment**

Needs assessment is carried out to find the educational and training needs of the learner.

Technology trends are regularly scanned and tracked by core teams at Aptech Ltd. TAG* analyzes these on a monthly basis to understand the emerging technology training needs for the Industry.

An annual Industry Recruitment Profile Survey# is conducted during August - October to understand the technologies that Industries would be adapting in the next 2 to 3 years. An analysis of these trends & recruitment needs is then carried out to understand the skill requirements for different roles & career opportunities.

The skill requirements are then mapped with the learner profile (user system) to derive the Learning objectives for the different roles.

➤ **Needs analysis and design of curriculum**

The Learning objectives are then analyzed and translated into learning tasks. Each learning task or activity is analyzed in terms of knowledge, skills and attitudes that are required to perform that task. Teachers and domain experts do this jointly. These are then grouped in clusters to form the subjects to be covered by the curriculum.

In addition, the society, the teachers, and the industry expect certain knowledge and skills that are related to abilities such as learning-to-learn, thinking, adaptability, problem solving, positive attitude etc. These competencies would cover both cognitive and affective domains.

A precedence diagram for the subjects is drawn where the prerequisites for each subject are graphically illustrated. The number of levels in this diagram is determined by the duration of the course in terms of number of semesters etc. Using the precedence diagram and the time duration for each subject, the curriculum is organized.

➤ **Design & development of instructional materials**

The content outlines are developed by including additional topics that are required for the completion of the domain and for the logical development of the competencies identified. Evaluation strategy and scheme is developed for the subject. The topics are arranged/organized in a meaningful sequence.

The detailed instructional material – Training aids, Learner material, reference material, project guidelines, etc.- are then developed. Rigorous quality checks are conducted at every stage.

➤ **Strategies for delivery of instruction**

Careful consideration is given for the integral development of abilities like thinking, problem solving, learning-to-learn etc. by selecting appropriate instructional strategies (training methodology), instructional activities and instructional materials.

The area of IT is fast changing and nebulous. Hence, considerable flexibility is provided in the instructional process by specially including creative activities with group interaction between the students and the trainer. The positive aspects of Web based learning –acquiring information, organizing information and acting on the basis of insufficient information are some of the aspects, which are incorporated, in the instructional process.

➤ **Assessment of learning**

The learning is assessed through different modes – tests, assignments & projects. The assessment system is designed to evaluate the level of knowledge & skills as defined by the learning objectives.

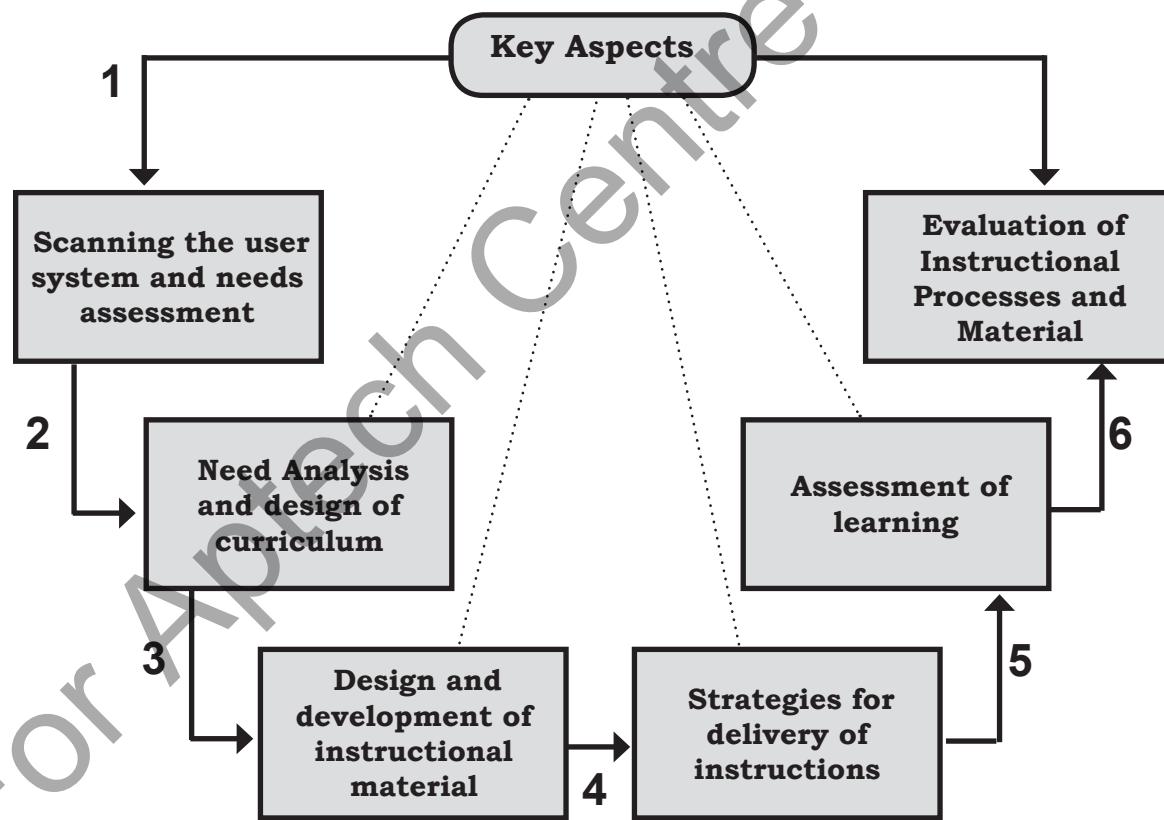
➤ **Evaluation of instructional process and instructional materials**

The instructional process is backed by an elaborate monitoring system to evaluate - on-time delivery, understanding of a subject module, ability of the instructor to impart learning. As an integral part of this process, we request you to kindly send us your feedback in the reply pre-paid form appended at the end of each module.

*TAG – Technology & Academics Group comprises of members from Aptech Ltd., professors from reputed Academic Institutions, Senior Managers from Industry, Technical gurus from Software Majors & representatives from regulatory organizations/forums.

Technology heads of Aptech Ltd. meet on a monthly basis to share and evaluate the technology trends. The group interfaces with the representatives of the TAG thrice a year to review and validate the technology and academic directions and endeavors of Aptech Ltd.

Aptech New Products Design Model



“

A little learning is a dangerous thing,
but a lot of ignorance is just as bad

”

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Preface

The book ‘Developing Responsive Websites with Bootstrap and jQuery’ Trainer’s Guide serves understanding on new features and functionalities of Bootstrap framework and jQuery. The faculty/trainer should teach the concepts in the theory class using the slides. This Trainer’s Guide will provide guidance on the flow of the session and also provide tips and additional examples wherever necessary. The trainer can ask questions to make the session interactive and also to test the understanding of the students.

This book is the result of a concentrated effort of the Design Team, which is continuously striving to bring you the best and the latest in Information Technology. The process of design has been a part of the ISO 9001 Certification for Aptech-IT Division, Education Support Services. As part of Aptech’s quality drive, this team does intensive research and curriculum enrichment to keep it in line with industry trends.

We will be glad to receive your suggestions.

Design Team

“

**Practice is the best of
all instructors.**

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Table of Contents

Sessions

1. Basics of Bootstrap
2. Understanding Programming in Bootstrap
3. Basics of jQuery
4. Functions, Widgets, Plugins in jQuery
5. Creating Bootstrap Responsive Layout
6. Creating Responsive Webpages Using Bootstrap and jQuery

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**“ The future depends on what
we do in the present.**

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Session 01: Basics of Bootstrap

1.1 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

1.1.1 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

1.1.2 Teaching Skills

To teach this session, you should be well versed with the concepts of Bootstrap. You should be familiar with the Bootstrap in detail. You should also know how to get started with Bootstrap and its benefits over JavaScript.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities.

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 2

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

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1.2 In-Class Explanations**Slide 3**

Let us introduce Bootstrap.

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.

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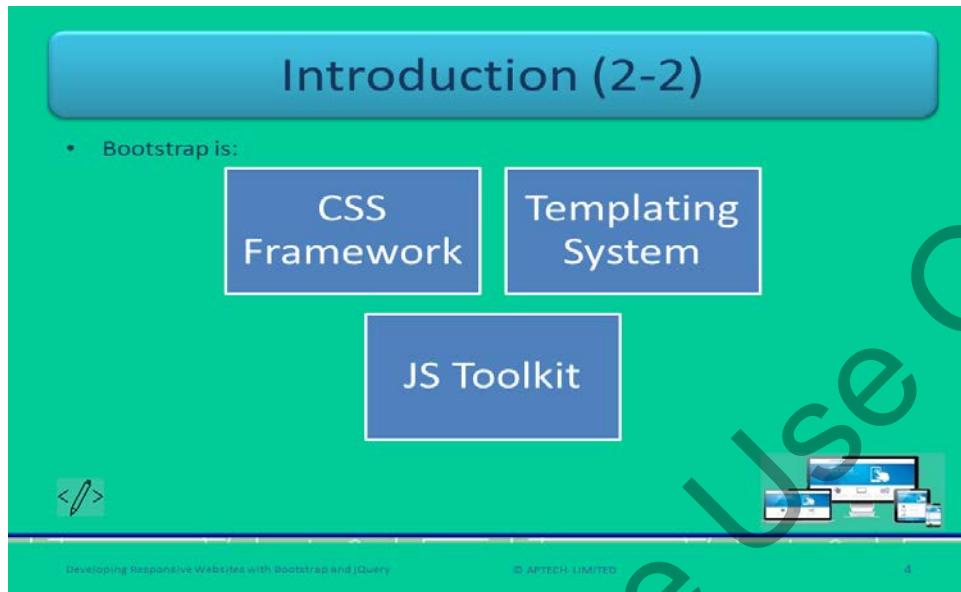


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Explain Bootstrap. Bootstrap is used to make simple and quick front end development of Web applications. Explain students that Bootstrap helps in saving time in designing the Webpages by styling elements. It reduces the burden of writing custom CSS classes of the Webpages elements by including Bootstrap files and predefined class names.

Slide 4

Let us understand about components of Bootstrap.



Elaborate each component of Bootstrap in detail using slide 4.

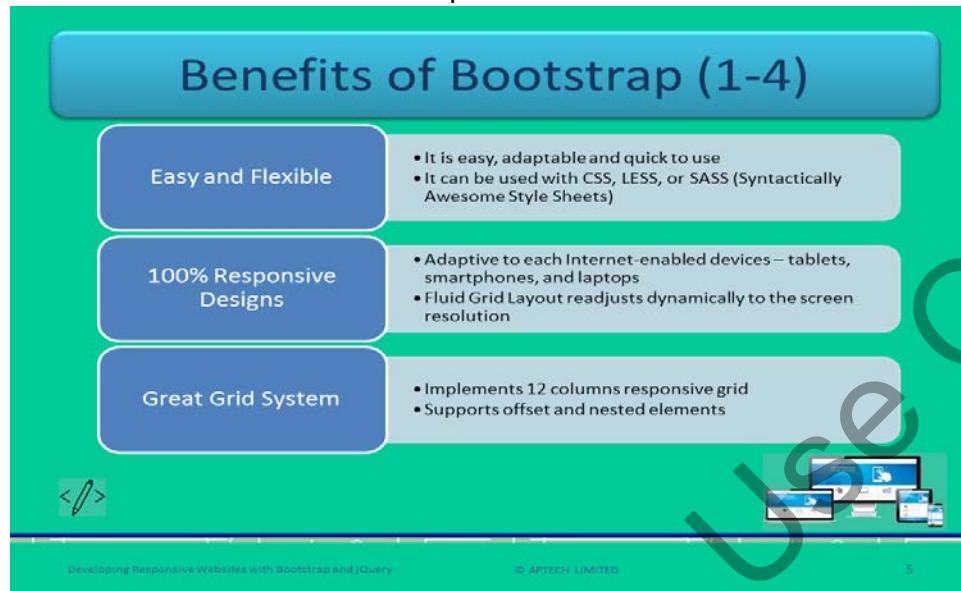
CSS Framework: CSS is used for applying styles to the elements of the Webpage. You can use them by including the classes and thus, assigning classes to the elements.

Templating System: Bootstrap is a templating system, which provides template for Websites. This will help the Web developers or designers in reducing time in writing entire code for each page. Bootstrap templates can be used directly.

JS Toolkit: JavaScript Toolkit helps in including js files that will reduce time in writing code. It is just drag and drop facility.

Slides 5 to 8

Let us understand about benefits of Bootstrap.



Tell the students benefits of Bootstrap point wise and explain each one using slide 5.

1. **Easy and Flexible:** Bootstrap is very easy to use and adaptable to different Web projects. It is very quick and responsive. It reduces time by dragging and dropping the elements instead of writing the code for each element.
2. **100% Responsive Designs:** It should be responsive to each Internet enabled devices. For example, it should fit to the screen of devices – smartphones, tablets, laptops, and desktops. It should be easy adaptive to screens with smooth appearance and easy navigation. This is achieved through Fluid container, which readjusts its width dynamically to screen resolution.
3. **Great Grid System:** Bootstrap has 12 column and responsive grid. This grid system supports offset and nested elements.

Benefits of Bootstrap (2-4)

| | |
|--------------------------|---|
| Better Development Speed | <ul style="list-style-type: none">• It has readymade blocks of code for designing• Developers are not required to know HTML and CSS coding |
| Browser Compatibility | <ul style="list-style-type: none">• Resolves many cross-browser compatibility issues• Web applications runs smoothly in Web browsers – Chrome, Safari, IE (Internet Explorer), and Firefox |
| Customization | <ul style="list-style-type: none">• It can be customized by selecting required aspects available on the Bootstrap customize page |

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Continue explaining benefits of Bootstrap using slide 6.

4. Better Development Speed: Bootstrap provides already written block of code to developers for designing Webpages. Thus, this helps in reduce time in designing and making Bootstrap even more efficient. Back-end developers can merge the readymade blocks with cross browser compatibility and CSS-Less functionality will help in saving lot of time.

5. Browser Compatibility: Bootstrap helps in resolving cross-browser compatibility issues. With the help of containers the screen width readjusts itself with smooth navigation and no pixels distortion. Web applications developed in Bootstrap will help in smooth running in many Web browsers.

6. Customization: Bootstrap can be used as per distinct design requirements. Developers can select and deselect the aspects as per requirements during customization. It is available on custom page, including CSS components, JS components, and utilities.

Benefits of Bootstrap (3-4)

| | |
|--------------------------------------|---|
| Consistency | <ul style="list-style-type: none"> • Mark Otto released first open-source Bootstrap version • He also described framework expansion through single core concept of merging designers and developers |
| Big Support | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • A pre-defined set of JS components are used for different functionalities of User Interface components • Examples – tooltips, alerts, and modal windows |





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Continue explaining benefits of Bootstrap using slide 7.

7. Consistency: At first, the twitter team expanded framework to improve the consistency across the internal tools. Later, the co-founder Mark Otto released first version of open source Bootstrap framework.

8. Big Support: Bootstrap provides a big supportive community that help Web developers with any sort of help at any point of time. Apart from this, the makers of Bootstrap keep the framework updated. Give students an idea about GitHub. GitHub is a Web based version control repository and Internet hosting service. It provides all the distributed version control and source code management functionality. Currently, it is being hosted on GitHub with 500 contributors.

Note: Bootstrap is the free open source framework. You need not to pay anything, it is available for free.

9. Bundled JavaScript Components: This framework has a set of JS components that use for UI components. Name a few examples to students such as – tooltips, alerts, and modal windows. A tooltip is also known as infotip or as a hint. It is a user interface element which appears when a user hovers the pointer or cursor on an item. An alert is a dialog box that gives warning message to the users. Modal window is a pop up window that appears on the top of the current page.

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

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Continue to explain benefits of Bootstrap using slide 8.

10. Simple Integration: Bootstrap has the added advantage of integrating with other frameworks and platforms. It can also use existing CSS files.

11. Extensive Pre-styled components: Bootstrap has pre-styled components such as drop-downs, alerts, and navigation bars. Developers need not to write code for such components.

Slide 9

Let us understand about setting up Bootstrap.

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)

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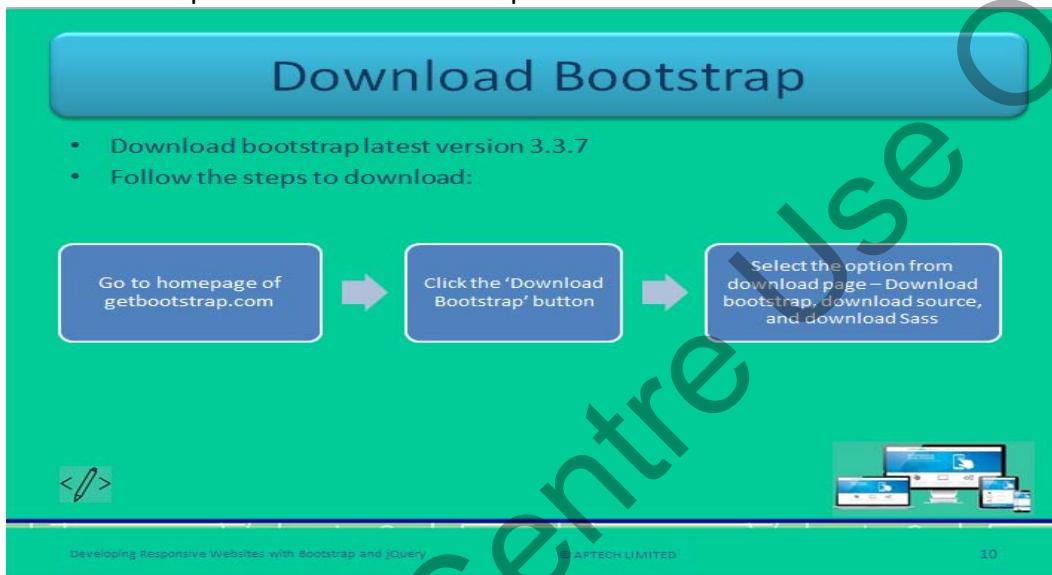
Explain students, how to set up BootStrap using slide 9.

Bootstrap is very easy to download and available for free. Tell the students that there are two ways to start using the framework on a Website:

1. Download from getbootstrap.com
2. Including it from Content Delivery Network

Slide 10

Let us understand steps to download Bootstrap.



Explain students the steps for downloading Bootstrap from getbootstrap.com Website using slide 10.

1. Go to the site getbootstrap.com
2. Click the button 'download Bootstrap'
3. Select an option from download page:
 - a) Download Bootstrap: It allows the precompiled, mini versions of CSS, fonts, and JavaScript downloads excluding original files of source code or documentation. It provides drag and drop facility rather than writing code for each element. It also includes compiled CSS, JS files, mini compiled versions, Bootstrap theme, and Glyphicon fonts.
 - b) Download Source: It is the source code version of Bootstrap. It provides downloading latest documentation and JS source code from GitHub. It consists of precompiled CSS and JS files, font files, and Bootstrap Less assets.
 - c) Download Sass: It is the latest Bootstrap version which is imported from LESS to SASS. It is only for Sass projects.

Slide 11

Let us understand about Content Delivery Network (CDN).

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

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Define CDN to students using slide 10.

Content Delivery Network is a system of network of distributed servers which delivers Webpages and Web content to client locations. Basically, CDN is for the developers who do not intend to host the framework by themselves. It focuses on quick delivery of Web content to global sites and high traffic sites.

Slide 12

Let us understand about file structure and source code.

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)

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Explain students the file structure and source code of Bootstrap framework using slide 12.

After downloading the Bootstrap with precompiled version, there will be a zip file that will be containing all the directories and files. Once the file is extracted, the content will be visible in the form of structured css, js, and fonts directories. CSS is a cascading style sheet files. JS is java script files. Font directories consist of all the fonts.

Slide 13

Let us understand about the file structure of precompiled Bootstrap version.

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/
    +-- glyphicon-halflings-regular.eot
    +-- glyphicon-halflings-regular.svg
    +-- glyphicon-halflings-regular.ttf
    +-- glyphicon-halflings-regular.woff
    +-- glyphicon-halflings-regular.woff2
  
```

</>

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Read out the list of file names of precompiled Bootstrap file structure using slide 13.

Slide 14

Let us understand about the file structure of Bootstrap.

Bootstrap File Structure

- Bootstrap File Structure has following categories:

| Scaffolding | CSS | Components | JavaScript Plugins |
|---|---|--|--|
| <ul style="list-style-type: none"> Basic grid structure Simple layouts Background Link Styles | <ul style="list-style-type: none"> Global CSS settings Advanced Grid System Basic HTML elements styles | <ul style="list-style-type: none"> Styles for reusable components Alerts, tabs, and page headers | <ul style="list-style-type: none"> Customs and interactive jQuery plugins Modals, tooltips, and popovers |

</>

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Tell students that there are few user interface elements that are offered by components and JS plugins using slide 14. These are listed as follows:

1. Button groups and button drop-downs
2. Page headers and hero unit
3. Navbar
4. Navigational tabs, pills, and lists
5. Labels
6. Thumbnails
7. Badges
8. drop-down
9. Tooltips
10. Alerts
11. Modals
12. Progress bars

Slide 15

Let us understand about default Bootstrap template.

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

Htm5shiv.min.js

Respond.min.js

</>

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15

Explain students about the default Bootstrap template code and describe few tags or attributes of HTML code using slide 15.

1. <head> tag: It ensures the depiction and touch zooming on the Internet-enabled mobile gadgets.
2. Width: This ensures the screen resolution of the page of the device that fits appropriately. You can set its value as 'device-width' that will fit into the screen of the target device such as tablets, smartphone, desktops.

Slide 16

Let us understand MaxCDN Code.

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 JavaScript -->
<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>
```

</>



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Describe this code snippet to students using slide 16. First describe MaxCDN to students mentioning that it is a CDN provider which provides desired JS and CSS files for working easily with Bootstrap.

In this snippet, the links are referring to MaxCDN under the head tag of different versions.

Slide 17

Let us understand about Bootstrap with CSS.

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 <ul style="list-style-type: none"> Preset width of viewport Does not change the width Easy to use and personalize Width in pixels .container class in <div> tag | Fluid <ul style="list-style-type: none"> 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 |
|---|--|

</>



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Explain students the difference of Bootstrap version 3 over version 2 using slide 17. Tell the students that the zooming can be disabled on any mobile device.

In Bootstrap, containers are the containing elements that contain contents of Websites and a grid system. These containers are non-nestable that is, no other container can include another container. It is of two types: Fixed and Fluid.

Describe each container in detail with examples:

1. Fixed Container: It has a preset width of layout of Webpage which remains constant and does not change across different screens and browsers. It does not vary with change in resolution. For example, In a whole page's layout, which is known as viewport, of width 960 pixels and each column has a preset width that does not change in fixed container. When a user changes the browser's window or shrinks it to, suppose, 959 pixels then the container changes to a new layout on a media query.
2. Fluid Container: It does not have a preset width such as in fixed container. It changes its width as there is a change in the size of browser or screen. For example, When a user resizes the browser window then each column of the container adjusts its width according to calculated relative size that is, 25% with 100% layout's width.

Slides 18 and 19

Let us understand about Bootstrap with JavaScript.

The slide has a blue header bar with the title "Bootstrap with JavaScript (1-2)". Below the header, there is a bulleted list of methods to include JavaScript plugins:

- 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

At the bottom left, there is a small icon of a computer monitor with code on the screen. At the bottom right, there is a small icon of three mobile devices (laptop, tablet, smartphone) showing a responsive design. The footer of the slide contains the text "Developing Responsive Websites with Bootstrap and jQuery", "© APTECH LIMITED", and the number "18".

Explain students about Bootstrap with JavaScript using 18. Web developers can include JS plugins by two ways – By using *.js files individually and by including bootstrap.js file or bootstrap.min.js file all at once.

Then tell students that there are again two ways of using JS plugins. One is through data attributes and other is via JavaScript.

Now, explain each method to the students by giving example or showing them code snippets:

1. Data Attributes – Developers can utilize all the Bootstrap plugins through Application Programming Interface, short for APIs. In some cases, data attribute APIs need to be disabled.

Explain the code snippet to students.

Code Snippet:

`$(‘body’).off(‘.data-api’)` – This will frees all the events on the body with the namespace ‘data-api’.

`$(‘body’).off(‘.alert.data-api’)` – This will turn OFF the functionality for a specific plugin ‘alert’.

2. JavaScript API – This is another way to use Bootstrap plugins. API is chainable method that returns a collection. This method should receive an object which is optional called options. This object is of string type. When this object is null, this means that this method is not receiving anything and hence, the method with a default behavior. Explain the code snippet to students.

Code Snippet:

`$("#newModal").modal(‘show’)` – In this method, ‘show’ is the string object to display the modal dialog immediately.

`$("#newModal").modal()` – This is the default method initialization.

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

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Explain students about events and transitions in Bootstrap using slide 19.

Events: These are custom events and are used to handle different actions of plugins. These are of two types of forms: Infinitive, and Past Participle. Infinitive form is invoked at the beginning of the event.

Transitions: It is recommended for Web developers to use **transition.js** file to apply basic transition effects. This file will not be required if developers are using compiled **bootstrap.js** file already.

Slide 20

Let us understand about Bootstrap Templates.

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 slide shows a preview of a blog post template. The template has a header with 'Page Heading' and 'Secondary Text', a 'Blog Post Title' by 'Start Bootstrap', a timestamp 'Posted on August 28, 2014 at 10:00 PM', and a large placeholder image labeled '900x300'. To the right is a sidebar with 'Blog Categories' (Category Name, Category Name, Category Name, Category Name) and a 'Side Widget Well' (Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.). At the bottom, there's a 'Read More' button and a small image of a laptop and smartphone. The footer contains 'Developing Responsive Websites with Bootstrap and jQuery' and '© APTECH LIMITED'.

Explain students about Bootstrap templates using slide 20.

Bootstrap template is basically a mock Website used by the Web designers for designing using Bootstrap framework. There are few components of Bootstrap template, they are:

1. JavaScript Code
2. CSS Code
3. HTML pages
4. Fonts
5. Design images

Now, explain the students with an example, this will give a good understanding.

For example, For an e-commerce Website, the template will have product category page, cart page, contact us page, and customer testimonial page. All these pages are standard pages for any e-commerce site.

There are different versions of Bootstrap templates. These have few characteristics:

1. Responsive
2. Easy customization
3. Ready to use
4. Reusable

Slides 21 to 23

Let us summarize the session.

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.



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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.

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Using slides 21 to 23 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.

1.3 Post Class Activities for Faculty

You should familiarize yourself with the topics of the next session.

Session 02: Understanding Programming in Bootstrap

2.1 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

2.1.1 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

2.1.2 Teaching Skills

To teach this session, you should be well versed with the programming in Bootstrap. You should be familiar with the Bootstrap programming in detail. You should also know about CSS, JavaScript, and how to write programs in Bootstrap.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities:

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 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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2.2 In-Class Explanations

Slide 3

Let us understand about components of Bootstrap.

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

Developing Responsive Websites with Bootstrap and jQuery © APTECH LIMITED 3

Describe the components of Bootstrap. Elaborate each point in detail using slide 3.

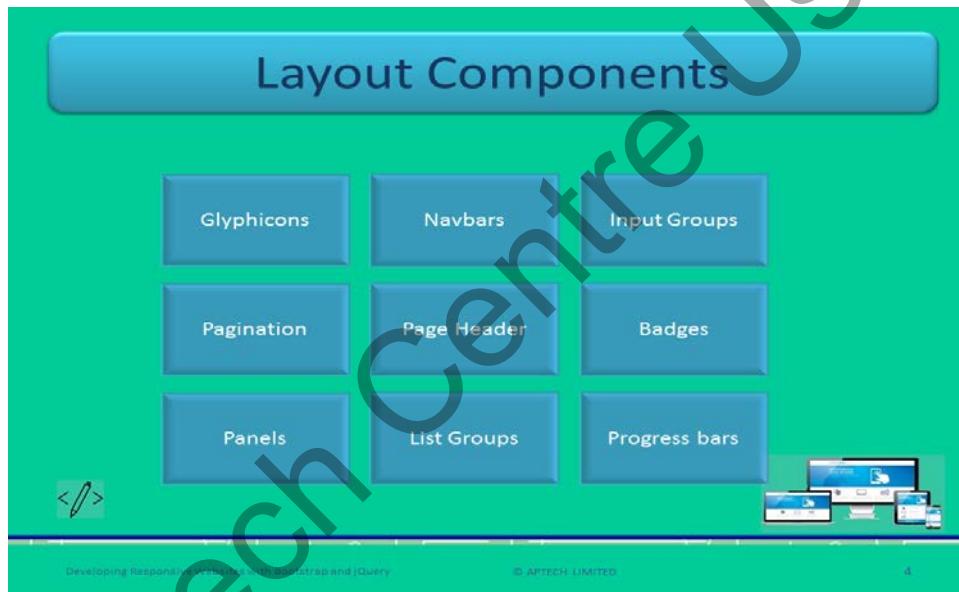
1. Bootstrap is a collection of Less stylesheets that basically utilize all the different components.

Then, it compiles them into a bundle that is used in adding to Webpages where each section can be removed or replaced. These stylesheets also provide standard style definitions for HTML components.

2. There are group of configuration variables which regulates components' visible features.
3. Each component consists – html structure, CSS code, and associated JS.
4. Bootstrap offers variety of JS components that are available as jQuery plugins. They offer additional elements such as carousels, alerts, modals, popovers, tooltips, dialog boxes, and drop-down.
5. All the latest versions of browsers are supported by Bootstrap 3. Some are mentioned – Firefox, Opera, Chrome, IE, and Safari. The advantage of Bootstrap components is that they are adaptive and hence, render themselves as per different browsers.

Slide 4

Let us understand about layout components.



Name the layout components of Bootstrap to the students using slide 4.

1. Glyphicons
2. Navbars
3. Input Groups
4. Pagination
5. Page Header
6. Badges
7. Panels
8. List Groups
9. Progress bars

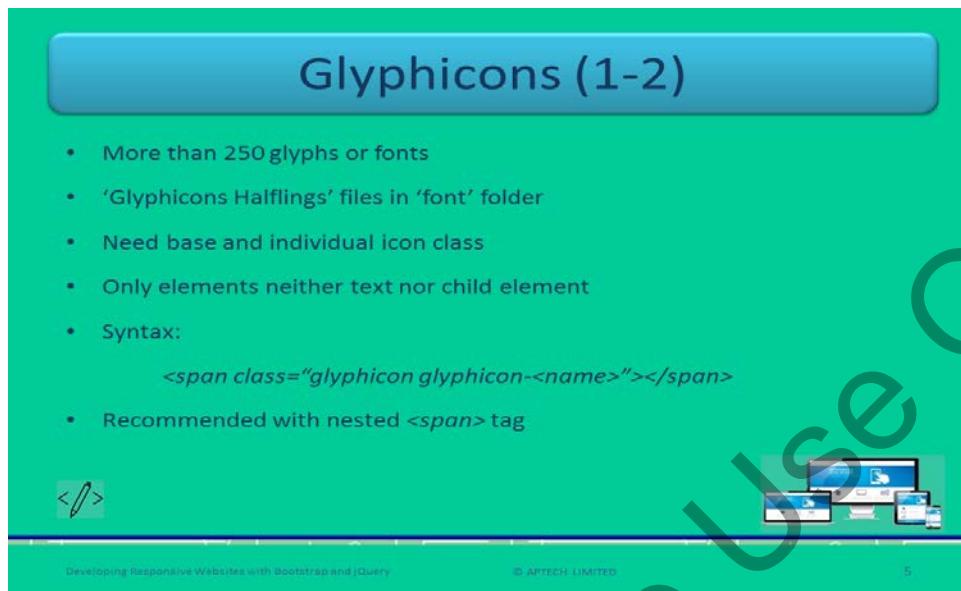
Slide 5

Let us understand about Glyphicons.

Glyphicons (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>">`
- Recommended with nested `` tag

</>



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Explain to students about glyphicon component of Bootstrap using slide 5. Brief them:

1. There are more than 250 glyphs or fonts in Bootstrap
2. They are available in 'Glyphicons Halflings' of 'font' folder
3. They need a base as well as individual icon class
4. The syntax for using Glyphicon is mentioned on the slide. Explain each keyword in brief to the students for better understanding.
 - a) Glyphicon: it is the base class
 - b) Glyphicon-name: it is an individual icon class. Basically, it uses unicode font reference in glyphicons halfling.
 - c) Name: Here, we use the exact glyphicon name.

Slide 6

Let us understand about how to use glyphicons in programming.

The slide has a blue header bar with the title "Glyphicons (2-2)". Below the header, there are two sections: "Code snippet:" and "Output:". The "Code snippet:" section shows a portion of an HTML file with line numbers 12 to 20. The code includes nested spans for icons. The "Output:" section shows a screenshot of a browser displaying the rendered HTML. The page title is "Some Glyphicons". It contains three paragraphs: "Envelope icon: ", "Hyperlinked Envelope: ", and "Search ". The browser interface is visible at the top, and a watermark for "APTECH LIMITED" is in the bottom right corner.

Show the students the example of using glyphicons using slide 6.

In the first image, the sample code is written. To use a glyphicon, nested span tag is used as shown in the sample code.

<p> Envelope icon: </p>

Now, check the second image on slide 6, in which the output of the code is shown.

Note: 1. The **aria-hidden** attribute should be set to true to prevent any kind of unwanted or confusing output by a screen reader.
2. **.sr-only** class for hiding the additional content on a Webpage but making it available for a screen reader to read.

Slide 7

Let us understand about Navbars.

The slide has a blue header bar with the title "Navbars". Below the title is a bulleted list of features:

- 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">
```

At the bottom of the slide, there is a footer bar with the text "Developing Responsive Websites with Bootstrap and jQuery" and "© APTECH LIMITED". There is also a small icon of a computer monitor.

Explain to students about navbars which is short form for Navigation bars.

1. It is a responsive navigation header that is appearing on the top of the Webpage.
2. It is adaptive or collapsible – because it can adjust the as per the size of the targeted screen in Bootstrap.
3. It can contain – links, drop-downs, buttons, icons, or may be combination of these elements.
4. It can be aligned left or right by the Web developers.
5. Basically, when the width of the viewport increases then the navbars are set horizontally.

Now, explain the syntax to the students.

<nav class= “navbar navbar-default”>

This will create a navbar in the Webpage.

.navbar-brand class is used to display the name of your organization.

.navbar-nav class is used for light and full-height navigation and it also provides classes which helps in adding links and drop-down to an unordered list. **Active** class indicates the current Webpage displaying in the browser.

Slide 8

Let us understand about Input Groups.

The slide has a blue header bar with the title "Input Groups (1-3)". Below the title is a bulleted list of features:

- 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

At the bottom left is a code snippet: </>. At the bottom right is a small image of four mobile devices displaying different web pages.

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Explain to students about input groups in Bootstrap using slide 8.

It is referred as extended form controls that append or prefix icons, buttons, or text to an input field.

Explain this by an example – You can prefix a dollar icon with an input field accepting price in dollars.

Explain the following classes and their uses:

1. `.input-group` container class – used for improving an input field by adding help text, button, or icon in front or at the rear of input field.
2. `.input-group-addon` class – used to affix text, button, or icon to the input field.
3. `Form-group` class – used to add some spaces between controls.

Slide 9

Let us understand about form controls of Input Groups.

The slide has a blue header bar with the title "Input Groups (2-3)". Below the title, there are two bullet points:

- Bootstrap supports following form controls:
Input, Textarea, Radio, Select, Checkbox
- Also supports input types:
Text, Number, Password, Email, Date Time, URL
Search, Color

At the bottom left is a small icon of a computer screen with code. At the bottom right is a small image of four mobile devices. The footer contains the text "Developing Responsive Websites with Bootstrap and jQuery", "© APTECH LIMITED", and the number "9".

Name all the form controls that Bootstrap supports: Input, Textarea, Radio, Select, and Checkbox.

Tell the students that in select form control even multiple selects are possible.

Now, name the input types that Bootstrap supports: Text, number, password, email, date, time, URL, search, and color.

Tell the students that in date and time input type includes date time-local, week, time, month, and date.

Note: It is not possible to add several form controls in an input group.

Slide 10

Let us understand about syntax of Input Groups.

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>
```

</>

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Show this sample code to the students for better understanding using slide 10.

```
<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>
```

This code shows how to create text and password input controls using .form-control class.

Slide 11

Let us understand about Pagination.

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:

Explain to students about pagination using slide 11.

It is used when there are many Webpages in a Website.

It is used with the unordered list element. To add this component, Web developers should use .pagination class in .

Show the screenshot given on slide 11 for the output of the pagination to the students for better understanding.

Slide 12

Let us understand about Page Headers.

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

Explain the students about page headers using slide 12.

1. It works such as a section splitter which splits into sections.
2. It adds proper spacing to the Webpage headings.
3. It is similar to heading 1 <H1> tag.
4. It is basically used to show each title on a Webpage specifically, when there are multiple titles.
5. You can add a page header by using .page-header class with the <div> tag.

Show the output given on slide 12 to the students for better understanding of a page header.

Slide 13

Let us understand about Badges.

The screenshot shows a presentation slide with a blue header bar containing the word 'Badges'. Below the header, there is a bulleted list of points and a code editor window. The list includes:

- 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>

```

The list also includes:

- Output of a badge

Below the list, there is a screenshot of a web browser displaying the word 'Badges' above three links: 'Hello' (with a badge of 2), 'World' (with a badge of 11), and 'Folks' (with a badge of 12). The browser interface shows tabs and a status bar at the bottom.

Explain students about badges using slide 13.

1. These are special labels that represent new items. Similar to unread emails near the inbox tab in the account.
2. They display numerical values that represent the number of items related to a link. For example, the numerical value in front of 'unread' tab represents the number of unread emails in an account.
3. Web developers should use .badge class within tag to create badges. You can also use this class in other elements such as buttons and list groups.

Show the output of the badge to the students for clear understanding.

Slide 14

Let us understand about Panels.

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:

```

1.3 <div class="container">
1.4   <h2>Demo Panel</h2>
1.5   <div class="panel panel-default">
1.6     <div class="panel-body">A Basic Panel</div>
1.7   </div>
1.8 </div>

```

- Output of the panels

The screenshot shows a browser window titled 'C:\App\Panel.html'. The page content is a single heading 'Demo Panel' followed by the text 'A Basic Panel'. The browser interface includes a back button, forward button, address bar, and tabs.

Explain to students about panels using slide 14.

- It is a container that holds the other components such as lists and tables with appropriate padding.
- Web developers should use .panel base class with standard padding and border to create a panel.
- Web developers should use .panel-body class that will place the content in the components.

Show the output of the panels to the students for clear understanding.

Slide 15

Let us understand about List Groups.

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:

```

1.3 <div class="container">
1.4   <h2>List Group With Badges</h2>
1.5   <ul class="list-group">
1.6     <li class="list-group-item">Hello <span class="badge">2</span></li>
1.7     <li class="list-group-item">World <span class="badge">15</span></li>
1.8     <li class="list-group-item">Folks <span class="badge">13</span></li>
1.9   </ul>
2.0 </div>

```

- Output of list groups:

The screenshot shows a browser window titled 'C:\App\List.html'. The page content is a list with three items: 'Hello' (with a badge of '2'), 'World' (with a badge of '15'), and 'Folks' (with a badge of '13'). The browser interface includes a back button, forward button, address bar, and tabs.

Explain to students about list groups using slide 15.

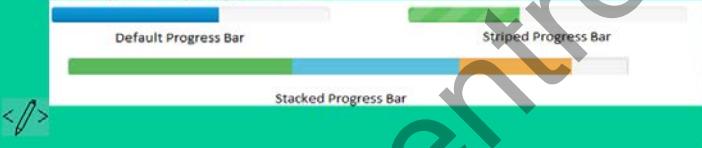
1. It renders an unordered list of items.
2. It provides complex and tailored content.
3. You can create it by using two classes - .list-group class with tag and .list-group-item class with tag.

Show the output of the list groups to the students for clear understanding.

Slides 16 and 17

Let us understand about Progress Bars.

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:
 - Default
 - Stripped
 - Animated
 - Stacked
- Examples of progress bars:
 - Default Progress Bar
 - Striped Progress Bar
 - Stacked Progress Bar

</>

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Explain to students about progress bars using slide 16.

1. It is used to display status of an action or process that is in progress such as downloading progress and uploading progress of a file.
2. It also represents a feedback or conveys an action that is occurring regarding a Webpage element.

Name the types of progress bars to the students – Default, Stripped, Animated, and Stacked.

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:

</>

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17

Continue explaining about progress bars using slide 17.

4. Show the examples of progress bars to the students for good understanding.

5. You can create a progress bar by using .progress class with <div> tag.

Show the output of the default type progress bar to the students for clear understanding.

Slide 18

Let us understand about programming in Bootstrap.

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

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18

Brief the students that the programming in Bootstrap mainly consists of CSS, JavaScript, and jQuery using slide 18.

In the head section of a Webpage the Bootstrap CSS exists.

At the end of the body section – Bootstrap JavaScript and jQuery exists.

Tell students that JavaScript can also be a part of head section of a Webpage. A browser starts loading a Webpage from top to bottom stepwise. If JavaScript is present in the head section then it will slow down the loading process.

Slide 19

Let us understand about programming in Bootstrap.

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

```
</>
```

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Explain to students about collapsible content using slide 19.

1. A collapsible is used to show or hide the content when there is a huge amount of content.
2. You can create a collapsible button by using collapse class in the `<div>` element. This class will indicate that the content in the `<div>` section is marked collapsible. This content will be visible or hidden when a user clicks the button.
3. Data-toggle attribute value is set to 'collapse' – which means you can toggle to show or hide the content by clicking the button.
4. Data-target attribute will link the button to the collapsible content.
5. Collapsible content in a Webpage is hidden by default.
6. The JavaScript code for collapsible content:

`$('.collapse').collapse();`

This will use the collapse plugin internally which will automatically provide the control over `<div>`.

Show the output of the collapsible component to the students for good understanding.

Tell the students that for proper functioning of collapsible, the Bootstrap version should include `transition.js` (plugin).

Slide 20

Let us understand about demo on Bootstrap functionality.

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.

</>

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Explain students the Bootstrap functionality using slide 20.

Inform that if they style each content of HTML forms with manual CSS code then it will be very tedious and complex and prone to errors. This is eliminated in Bootstrap by providing a predefined collection of classes for styling and aligning the form controls.

There are three layouts of forms: Vertical, Horizontal, and Inline.

Web developers include all the elements in <div> elements by using .form-group class and .form-control class in the elements <input>, <textarea>, and <select>.

Slide 21

Let us understand about vertical forms.

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

</>

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Explain students about vertical forms using slide 21.

1. It is a default layout in Bootstrap for forms.
2. In this vertical layout, styles are specified for controls without using a base class.
3. In this layout, all the controls are properly labelled and are aligned to left.

Show the output of a vertical form layout to the students for better understanding.

Slide 22

Let us understand about inline forms.

The slide has a blue header bar with the title 'Inline Forms'. Below the header is a green content area. Inside the green area, there is a screenshot of a web browser window showing an 'Inline form' example. The browser window has a title bar 'C:\Users\dhollap\Desktop\p.html' and a tab 'Bootstrap Example'. The main content of the browser shows an 'Inline form' with labels 'Email:' and 'Password:' next to their respective input fields. A note below the labels says 'Make the viewport larger than 768px wide to see that all of the form elements are inline, left aligned, and the labels are alongside.' At the bottom of the slide, there is footer text 'Developing Responsive Websites with Bootstrap and jQuery' and 'APTECH LIMITED' along with a page number '22'.

Explain students about inline forms using slide 22.

1. In this layout, all the elements are in line that is one after the other and are left aligned.
2. The minimum width of the viewport of the browser is 768 pixels.
3. Web developers arrange the controls side-by-side by squeezing the layout of the form vertically.
4. The inline form layout is useful when the screen size of the device suits.
5. Web developers should use .form-inline class in the <form> element.

Show the output of an inline form layout to the students for better understanding.

Slide 23

Let us understand about popovers.

The slide has a blue header bar with the word 'Popover'. Below it is a bulleted list of five points:

- 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:

Below the list is a screenshot of a web browser window. The title bar says 'C:\Users\Abhishek\Desktop\p.html'. The main content area shows a button labeled 'Toggle popover' with a tooltip above it. The tooltip has a header 'Popover Header' and a message 'Hi there!!'. At the bottom of the slide, there is footer text: 'Developing Responsive Websites with Bootstrap and jQuery', '© APTECH LIMITED', and '23'.

Explain students about popovers using slide 23.

1. It is pop-up dialog box that appears on clicking an element on a Webpage.
2. It is similar to a tooltip.
3. A popover can display much more content unlike tooltip.
4. It is not CSS only plugin and thus, initialize through jQuery.

Show the output of a popover to the students for better understanding.

The jQuery code for popover:

`$('.[data-toggle="popover"]').popover()`

This will select the element that has the data-toggle property value to popover that will trigger the popover method.

Slides 24 to 26

Let us summarize the session.

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.



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Summary (2-3)

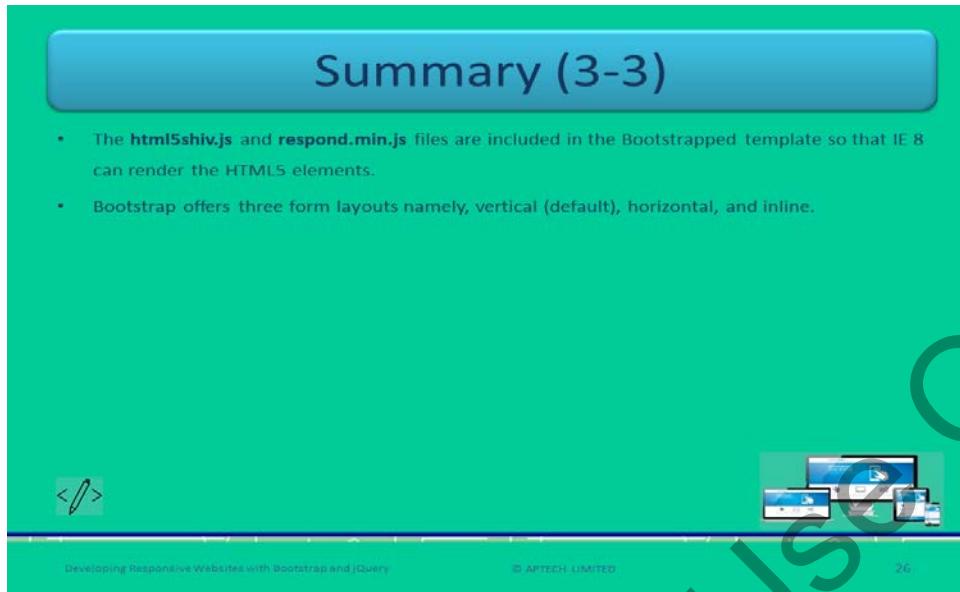
- Badges are special labels indicating new items, which is similar to the number of unread emails near the Inbox tab in an e-mail account.
- A panel refers to a container that can hold other components such as lists and tables with proper padding.
- A list group renders an unordered list of items as 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.



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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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Using slides 24 to 26 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.

2.3 Post Class Activities for Faculty

You should familiarize yourself with the topics of the next session.

Session 03: Basics of jQuery

3 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

3.1.1 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

3.1.2 Teaching Skills

To teach this session, you should be well versed with the concepts of jQuery. You should be familiar with the JSON in detail. You should also know how to get started with jQuery and its functions.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities:

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 2

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

</>



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3.2 In-Class Explanations

Slide 3

Let us introduce 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

</>



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Explain students about jQuery using slide 3.

1. It refers to a lightweight and brief JavaScript library that focuses to make the JS programming easy and faster.

2. It is a feature rich and open source library that aims to simplify complicated or complex tasks. These tasks include – manipulating and traversing an HTML/CSS page, handling events, animating objects, and making Asynchronous JavaScript and XML (AJAX) calls.
3. This open source library offers easy to use API. This helps in getting compatibility across many browsers.
4. jQuery binds many common tasks into built-in methods. Instead of writing lines of code, Web developers can take use of these built in methods of JS code. Thus, helps in reducing time and make programming faster.

Slides 4 and 5

Let us understand about benefits of jQuery over JavaScript.

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

</>

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Explain students about benefits of jQuery over JS using slide 4.

1. Unobtrusive JS – jQuery offers Webpage designing through unobtrusive JavaScript. This is an approach that separates functionality among presentation and structure of a Webpage.
2. Lightweight – jQuery library size is in KB (kilo Bytes) which is smaller than a digital photo file. The current version of jQuery 2.x is smaller than version 1.x. The version 2.x is widely used because it supports IE 6/7/8.
3. Easy to use – jQuery is very easy to use. It has very simple yet robust syntax. This syntax helps to select the page elements that need to be change.
4. Big and focused library – Web developers can perform variety of functions of jQuery unlike JavaScript. Thus, jQuery offers many utility functions. The functions include – parsing data, string trim, and array search.

Benefits of jQuery over JS (2-2)

| | |
|-----------------------------|--|
| Extensibility | <ul style="list-style-type: none">Plugin framework – third party and official pluginsAny feature can be included through plugin |
| Browser Compatibility | <ul style="list-style-type: none">Resolves cross browser issuesjQuery implemented compatibility code |
| Strong Community | <ul style="list-style-type: none">Exclusive community where developers improve functionalityOffers several plugins which accelerate Web development process |
| AJAX Support | <ul style="list-style-type: none">Creates AJAX templatesOffers smooth interfaces and efficient loading |
| Comprehensive Documentation | <ul style="list-style-type: none">Official website has in-depth documentation and tutorialsHelps beginners for easy use |

</>



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Continue to explain the benefits of jQuery to students using slide 5.

5. Extensibility – jQuery is a plugin framework which helps to reduce the complexity to extend the jQuery. This framework has both the third-party and official plugins. Suppose, if any feature is not there in the library then it can be included through plugins.

6. Browser Compatibility – jQuery provides good compatibility across all the Web browsers. Similar to few JS libraries, jQuery also resolves cross-browser issues.

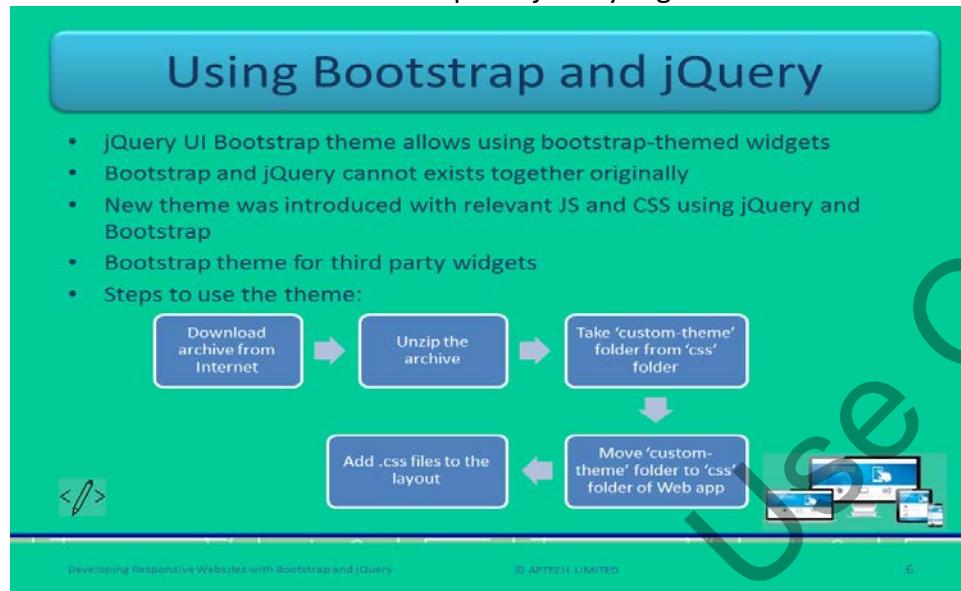
7. Strong Community – jQuery has an exclusive community which helps the Web developers to improve its functionality.

8. AJAX Support – jQuery offers creating AJAX templates. These templates help in providing smooth interface and efficient loads. Actions can be performed by users on a Webpage without reloading the entire page.

9. Comprehensive Documentation – jQuery official Website has proper and in-depth documentation and tutorials which help the users to understand all the features of jQuery.

Slide 6

Let us understand about how to use Bootstrap and jQuery together.



Explain students about using bootstrap and jQuery together using slide 6.

1. JQuery with bootstrap is used through jQuery UI bootstrap theme. This theme allows bootstrap themed widgets without disturbing the appearance of components.
2. Earlier this existence was not available because of which trying to use them together created conflicts with JS and CSS styles and classes.
3. This new theme was available with relevant JS and CSS. This is used for designing a Web application using jQuery and bootstrap.
4. It provides bootstrap theme for third party jQuery widgets which is used for designing UI.
5. The steps to use this theme are as follows:
 1. Download the archive from the Internet.
 2. Unzip the archive folder.
 3. Take the folder 'custom-theme' from the folder 'css' of unzipped package.
 4. Move the folder 'custom-theme' to the folder 'css' of the Web application to be used.

Add the relevant .css files to the layout of the Website.

Slide 7

Let us understand about how to use jQuery in Web application.

The slide has a blue header bar with the title "Use of jQuery in Web Application". Below the header, there is a bulleted list:

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

Two circular icons point to boxes containing instructions:

- Download the library file from [jQuery.com](https://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](#)

At the bottom left is a small icon of a computer monitor with code symbols (</>). The footer contains the text "Developing Responsive Websites with Bootstrap and jQuery" and "© APTECH LIMITED".

Explain students about using jQuery in a Web application using slide 7.

1. JQuery library is a JavaScript file which is used for programming in jQuery. It is used to developed Web applications.
2. There are two ways to use the file:
 1. First, download the library file from [jQuery.com](https://jquery.com). Then, refer it in a HTML code and then, save the downloaded file in the directory of Webpages.
 2. Include the jQuery library in HTML code by referring to CDN. Just such as Google and Microsoft.

Now show a code snippet to the students for good understanding.

```
<head>
<script src="https://ajax.aspnetcdn.com/ajax/jquery/jquery-3.2.0.min.js"></script>
</head>
```

This snippet shows how to use the library in a HTML code. Here, the library is Microsoft CDN.

Slide 8

Let us understand about jQuery syntax.

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

</>

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Explain students about jQuery syntax using slide 8.

jQuery helps the Web developer to find and select the HTML elements and trigger the desired set of actions on it. That is why, the customized syntax is being provided. The syntax is:

\$(selector).action()

Explain each symbol of the syntax to the students.

\$: This is the jQuery identifier which indicates the use of jQuery.

(selector): This keyword is used to find and select the HTML elements which are being triggered.

Action(): This is a jQuery action which is performed on selected elements.

Now, tell the students about few examples of using syntax.

\$(this).hide(): This function is used to hide the selected HTML element.

\$("#div").fadeIn(): This function is used to fade in all the <div> elements.

\$("#info").hide(): This function is used to hide the element whose id is #info.

\$(".info").show(): This function is used to show the element whose class attributes value is info.

Using the syntax mentioned on slide 8, explain students about each symbol in detail:

Document: Refers to the DOM of the HTML page.

Ready: This is an event which is raised when fully loaded DOM is ready to manipulate through JS.

Function: An anonymous function which has no name and contains an action to be performed.

Slide 9

Let us understand about functions of jQuery.

jQuery Functions

- Function definition can be done in four ways:

| | | | |
|---|--|---|--|
| Basic Declaration | Declaration as a Variable name | Self-invoking Function Declaration | User-defined Function Declaration |
| <ul style="list-style-type: none"> Easy way of declaration Used for quick testing Not recommended to use | <ul style="list-style-type: none"> Defining a function through an expression assigned to a variable Variable is used as a function | <ul style="list-style-type: none"> Expression where script invokes automatically without being called No name and no explicit calls | <ul style="list-style-type: none"> Developers creating own functions jQuery.fn or \$fn creates a user-defined function |

</>

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Explain jQuery functions to students using slide 9.

There are four ways to define jQuery functions:

1. Basic Declaration: It is an easy way of function declaration in jQuery.

Show a code snippet to students for good understanding.

```
function Multiply(var1, var2, var3)
{
    return (var1 * var2 * var3);
}
```

```
document.write("Basic Way:"+Multiply(10, 10, 8));
```

This Multiply function is defined which returns product of three numbers.

2. Declaration as a variable name: A function can be defined through an expression which is assigned to a variable.

Show the code snippet to students for better understanding.

```
var Multiply = function (var1, var2, var3)
{
    return (var1 * var2 * var3);
}
```

```
document.write("Function as Variable Name "+Multiply(10, 10, 8));
```

In this snippet, the variable Multiply is assigned to a function which returns the product of three numbers.

3. Self-invoking function declaration: An anonymous function can be assigned to a method directly instead of to a variable. This function has no name and it is not possible to call it explicitly.

Show the code snippet to students for better understanding.

```
(function () {document.write("Self Invoking Function, Hello! I called myself");})();
```

The self-invoking function is defined within parentheses and calls itself on its own.

4. User-defined Function Declaration: When a Web developer creates its own function then it is known as user defined function.

Show the code snippet to students for better understanding.

```
$(document).ready(function(){
    $.fn.myFunction = function(){
        alert('You have successfully defined the function!');
    }
    $(".call-btn").click(function(){
        $.fn.myFunction();
    });
});
```

`$.fn` object creates a user-defined function named `myFunction` which contains `alert` function.

Slides 10 to 12

Let us understand about jQuery selectors.

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:

| | |
|------------------------|-------------------------------|
| <code></></code> | <code>Id</code> |
| | <code>Class name</code> |
| | <code>Tag name</code> |
| | <code>Attribute</code> |
| | <code>Attribute values</code> |
| | <code>Other selectors</code> |

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Explain to students about jQuery Selectors using slide 10.

1. jQuery library use CSS and its own custom selectors which help in smooth access and manipulation of HTML elements in DOM.
2. jQuery selector is a function which is in the form of expression used for searching matching element in DOM.
3. Selectors can select single or multiple HTML elements that trigger different actions.
4. Selector begin with jQuery identifier (\$) and is followed by parentheses.
5. jQuery library allows accessing the elements by – Id, class name, tag name, attribute, attribute values, and other selectors.

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>')`

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Continue to explain to students about jQuery selectors using slide 11.

1. Id Selector: It is an id attribute of a HTML tag that is used to search corresponding HTML element. ID is a unique identifier of each HTML element which is used to find single tag at a time. The syntax is `$('#<id>')`

id: the value of id attribute of the required HTML element.

Id selector features are:

1. It is the most efficient selector
2. It accesses only the first element when there are 2 or more tags with same id
3. It is not same as document.getElementById()
4. It is slow as compared to document.getElementById()
5. It is not prone to errors unlike document.getElementById() where error is raise when element is not found

2. Class selector: This selector finds the HTML element having specified class. It works by relying on document.getElementsByClassName() function. The syntax is:

`$('.<class>')`

class: Is the value of class attribute of the required HTML element.

jQuery Selectors (3-3)

Element Selector

- Access elements as per name
- Specify element selector within parentheses followed by \$ 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")

</>


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Explain students further about jQuery selectors using slide 12.

3. Element selector: It accesses elements as per their name. A Web developer specifies the element selector within parentheses followed by \$ character.

Syntax

`$(<element>)`

element: Is the name of the element.

4. Checked selector: It accesses and selects all selected radio buttons and check boxes.

Syntax

`$(":checked")`

Slide 13

Let us understand about JSON and its conversions.

JSON and Conversions to JSON

- It is a lightweight format used for exchanging and storing data
- Alternate to eExtensible 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

</>


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Explain to students about JSON using slide 13.

1. JSON refers to a lightweight format which is used for exchanging and storing data.
2. It is an easier alternative to XML because it is a self-describing format which helps in exchanging data between server and client.
3. The data exchanged between server and client happens only in simple text format.
4. JSON is a simple text format although it uses JS syntax.
5. It works independent of any programming language.
6. A Web developer can convert an object into JSON and can send it to server or can convert the data obtained from server into JSON objects or arrays.

These processes of conversions are free from complex parsing.

Slide 14

Let us understand about how to create JSON objects.

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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Explain to students about creating JSON objects using slide 14.

It is similar to JS objects. That is why it is written in the form of pairs – Key/value or name/value.

In JSON, key or name is always a string that is why it is to be in double quotes unlike in JS. Whereas in JS, the strings can be in single or double quotes.

In JSON, a name should be in double quotes and is separated by the value with a colon.

Syntax

{"name":value}

value: a valid data type – number, string, Boolean, array, null, or object

Inform students that JSON does not support date data type. It can only be represented as string.

Show the code snippet to students for good understanding about JSON code.

Code Snippet:

{"city":"Moscow"}

```
{"age":40}
{"marriage":"1980-12-23"}
```

Slide 15

Let us understand about data access from JSON objects.

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

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Explain to students about accessing data from JSON objects using slide 15.

To access the data from JSON objects, use dot (.) notation and corresponding property name.

Syntax

```
<Object>.<propertyName>;
```

Show a code snippet to students for better understanding about JSON objects.

```
var employeeJSON =
```

```
{
  "firstName": "Philips",
  "lastName": "LG",
  "gender": "Male",
  "salary": 5000,
  "bike": null
};
```

This is creating JSON object.

```
var firstName = employeeJSON.firstName;
```

This code is accessing all the data from employeeJSON object using jQuery.

Slide 16

Let us understand about how to use JSON arrays.

The slide has a blue header bar with the title 'Using JSON Arrays'. Below the title is a bulleted list of four points:

- 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" ]
```

At the bottom left is a code editor icon with '</>' and at the bottom right is a small image of a computer monitor displaying a web page.

Small text at the bottom left: Developing Responsive Websites with Bootstrap and jQuery. Small text at the bottom center: © APTECH LIMITED. Small text at the bottom right: 16.

Explain to students about JSON arrays using slide 16.

Array is useful for storing more than one data objects. JSON array holds several objects.

Create a JSON array by including objects in square brackets which is separated by comma (,).

Explain to students by showing a code snippet.

Code Snippet:

```
var employeesJSON = [
{
  "firstName": "Philips",
  "lastName": "LG",
  "gender": "Male",
  "salary": 5000
},
{
  "firstName": "Samsung",
  "lastName": "Sam",
  "gender": "Female",
  "salary": 4000
}];
```

This variable is storing data for two employees.

Code Snippet:

```
var result = employeesJSON[0].lastName;
var result = employeesJSON[1].lastName;
```

This is how to access both the JSON objects.

Slide 17

Let us understand about how to convert string to JSON object.

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

</>



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Explain students about conversion of string into JSON objects using slide 17.

Developers can parse a string using `JSON.parse()` function. It is used to convert the string into JSON object or an array.

The string should be used in JSON format to avoid the errors.

Slide 18

Let us understand about event delegation in jQuery.

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

</>



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Explain students about events delegation in jQuery using slide 18.

1. An event is an exact moment when an action is performed by a user. Examples of events
 - Webpage loading, clicking an element, selecting or deselecting a checkbox, and hovering a mouse.
2. Web developers can design dynamic Webpages with the help of events.
3. Event listener listens to the event being raised and notifies to the handler.
4. Event handler handles the event by a custom function that informs what needs to be done.
5. Event delegation allows a Web developer to assign a single listener to a parent element. This parent element listens for all the descendants corresponding to a selector.
6. The methods – on() and delegate() enables event delegation in jQuery. It eliminates the requirement for adding event listeners to tags.

Slide 19

Let us understand about event delegation in jQuery.

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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Explain students about events delegation in jQuery using slide 19.

The main features of event delegation are – event bubbling and target property.

The target property refers to the element that has originated the event.

With the help of event delegation, developers can add a handler to an element, wait for event bubbling, and quickly identify source of event.

The benefits of event delegation are:

1. Less handlers to take up memory
2. Better performance
3. Reduced risk of crash
4. No re-assignment of handlers when child elements get changed

Slides 20 to 22

Let us summarize the session.

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.

</>



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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.

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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.



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Using slides 20 to 22 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.

3.3 Post Class Activities for Faculty

You should familiarize yourself with the topics of the next session.

Session 04: Functions, Widgets, Plugins in jQuery

4.1 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

4.1.1 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

4.1.2 Teaching Skills

To teach this session, you should be well versed with the concepts of jQuery. You should be familiar with the AJAX in detail. You should also know about functions, widgets, and plugins in jQuery.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities:

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 2

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

</>



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4.2 In-Class Explanations**Slides 3 to 6**

Let us understand about built-in functions of jQuery.

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 |

</>



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Explain students about built-in functions of jQuery using slide 3.

jQuery contains different capabilities of JavaScript. JS has a set of built-in functions that are handy in nature.

In JS built-in functions, the developers can manipulate data values such as dates, numbers, and strings.

Now, briefly explain built-in functions to students one by one.

1. charAt() – it fetches the character at the provided index.
2. Concat() – it will return a new string by concatenating the mentioned two strings.
3. indexOf() – it fetches the index inside the requesting string object of the initial occurrence of the mentioned value. It will return -1 if no index is found.

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

</>

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Briefly explain built-in functions to students one by one using slide 4.

4. length() – It returns the number of characters in the mentioned string.
5. forEach() – It will invoke a function for each array element.
6. push() – It will append single or multiple elements at the end of an array and it will fetch the 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

</>



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Continue explaining built-in functions using slide 5.

7. **pop()** – It will remove and return the last array element.
8. **subStr()** – It is sub string function which will extract the string characters at the mentioned index location till it mentioned index length.
9. **Reverse()** – It will reverse the entire string by changing the order of the array elements, making the first element as last and last element as the first in the array.

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

</>



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Continue explaining built-in functions using slide 6.

10. **sort()** – It will sort all the array elements in ascending or descending order.
11. **toLowerCase()** – It will convert the mentioned string value into lower case.
12. **toUpperCase()** – It will convert the mentioned string value into upper case.
13. **toString()** – It will convert the mentioned value into string.

Slide 7

Let us understand about live function of jQuery.

The slide has a blue header bar with the title 'Live Function in jQuery'. Below the title is a bulleted list of points:

- 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

At the bottom left, there is a small footer: 'Developing Responsive Websites with Bootstrap and jQuery'. At the bottom right, there is a small icon of three mobile devices and the number '2'.

Explain students about live() method in jQuery using slide 7.

1. It is a function that delivers order to single or multiple event handlers for all the elements that match with the selector and elements that define a function to run when an event occurs.
2. This live() method is another way to perform event delegation in jQuery.
3. The on() and delegate() functions enables bubbling up the event to the parent element of the source.
4. An associated event handler can be removed by the use of die() method.
5. The syntax is:

`$(selector).live(event,data,function);`

event: A single or multiple events to delegate to the elements.

data: This is optional and it represents extra data to be passed to the function.

function: It is the function that is to be executed once the event takes place.

Tell students that jQuery recommends the use of on() and off() functions instead of live() and die() functions in the latest versions of jQuery.

Slide 8

Let us understand about jQuery with AJAX.

The slide has a blue header bar with the text "jQuery AJAX". Below the header is a bulleted list of eight items. At the bottom of the slide, there are four boxes labeled "Text", "XML", "JSON", and "HTML". To the left of these boxes is a small icon of a bracket with a double slash inside. In the bottom right corner, there is a small image of three computer monitors displaying web pages.

- 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

</>

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Explain students about jQuery with AJAX using slide 8.

1. AJAX allows updating many parts of Webpage by exchanging data between server and client.
2. It exchanges the data without reloading or refreshing the whole Webpage.
3. The examples of AJAX Websites are – Gmail and YouTube.
4. If AJAX coding is without jQuery then it will be bit complicated because syntax of implementation will be different for different browsers.
5. With the help of jQuery the extra effort will be reduced.
6. jQuery offers many AJAX methods to develop Web applications.
7. With the help of jQuery AJAX functions, data can be requested from distant Web servers via GET and POST.
8. This data can be in four formats – Text, eXtensible Markup language (XML), JavaScript Object Notation (JSON), and HyperText Makrup Language (HTML).

Slide 9

Let us understand about AJAX jQuery load() method.

The slide has a blue header bar with the title 'AJAX jQuery Load() Method'. Below the title is a bulleted list:

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

A code snippet is shown in a box:

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

At the bottom left is a small icon of a person at a computer, and at the bottom right is a small image of four mobile devices (phones and tablets) showing different web pages.

Explain students about load() method of AJAX jQuery using slide 9.

1. It is an easy and yet robust AJAX functionality.
2. It first loads the data from the Web server and then inserts the data into the HTML element.
3. Its syntax is:

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

URL: Uniform Resource Locator (URL) of a resource on a server

data (optional): it indicates a set of key/value pairs as a query string in the form of JSON object or string that goes along with the request. The default request method used here is GET.

callback (optional): it indicates the name of a callback function that will run after the load() method completes executing the request.

Slide 10

Let us understand about callbacks.

The slide has a blue header bar with the title 'Callbacks'. Below the title is a bulleted list of points:

- Runs once when current jQuery effect is over
- Line by line execution in JavaScript, lead to errors
- Syntax:
`$(selector).hide(speed,callback);`

 To the right of the list, there is a small image showing three mobile devices displaying a website.

Below the list is another bulleted list:

- Effects are – hide, fade, or slide
- In load() optional callback parameter can be callback function
- Syntax:
`$(selector).load(URL,data,function(response,status,XHR));`

At the bottom of the slide, there is footer text: 'Developing Responsive Websites with Bootstrap and jQuery' and '© APTECH LIMITED'.

Explain students about callbacks in jQuery using slide 10.

1. Callback function runs once when any jQuery effect is over. The effects are – hide, fade, or slide.

2. In JavaScript, the execution happens line by line which disturbs the proper output as next line of code gets executed even when the former is not finished.

3. Its syntax is:

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

speed: Is optional and indicates the speed of hiding an element in milliseconds or as fast or slow.

callback: Is optional and indicates the name of a callback function to run after hide() executes completely.

4. In load() function, the optional parameter 'callback' indicates callback function.

5. Its syntax:

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

response: fetched content in case loading is successful.

status: the status of the loading action.

XHR: Possesses the XMLHttpRequest object with response text.

Tell students that XHR has all contents of the browser's native XMLHttpRequest object.

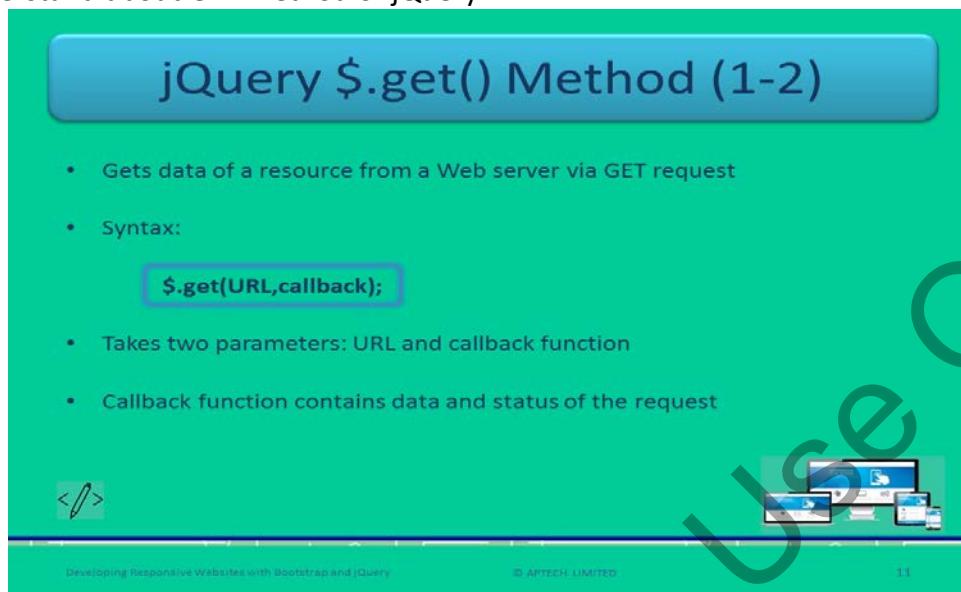
Slide 11

Let us understand about GET method of jQuery.

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

</>



Explain students about GET method of jQuery.

1. This method is used to fetch data from a Web server through GET request.
2. It has two parameters – URL and callback function
3. Its syntax is:
`$.get(URL,callback);`
URL: The URL a Web developer intends to request.
callback (optional): A function to be executed when the request is successful.
4. This optional callback function contains data and status of the request.

Slide 12

Let us understand about differences between load() method and \$.get() method.

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

| Point of Distinction | Load() | \$.get() |
|----------------------|--|--|
| Functionality | 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> |



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12

Explain students about differences between load() and \$.get() using slide 12.

1. Functionality – load() function loads only HTML data whereas, \$.get() function loads any type of data – JSON and script.
2. Type of HTTP request – load() function sends GET or POST request whereas, \$.get() sends only GET request.
3. Selector Usage – load() function follows a selector to insert the content into the matched element whereas, \$.get() function does not follow a selector while coding. It invokes a callback function instead.
4. Syntax - load() function syntax is: `$('.selector').load('url','data');`
 \$.get() function syntax is:

```
$.get('url', 'data', function (response){
    $('.selector').html(response);
});
```

Slide 13

Let us understand about `$.post()` method of jQuery.

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




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Explain students about jQuery `$.post()` function using slide 13.

1. This post() function fetches the data of a resource from a Web server through POST request.
2. Its syntax is:
`$.post(URL,data,callback);`
 URL: The URL a Web developer intends to request.
 Data (optional): represents extra data to be passed to the function.
 Callback (optional): A function to be executed when the request is successful.

Slide 14

Let us understand about the difference between `$.get()` method and `$.post()` method.

\$.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. |




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Explain students about the difference between `$.get()` and `$.post()` functions using slide 14.

1. Functionality: The `get()` function fetches data from a Web server and can send data also whereas, `post()` function changes the data on a Web server and can send data also.
2. Caching: The `get()` function caches the requested data and returns it whereas, `post()` does not cache data.
3. Method of sending data: The `get()` function appends the data to the URL as a query string whereas, `post()` function includes the data in the message body.
4. Limitation on sent data: The `get()` function has the limited amount of data to be sent whereas, `post()` function has no limitation on amount of data.

Slides 15 and 16

Let us understand about autocomplete function of jQuery.

The slide has a blue header bar with the title 'Autocomplete Function (1-2)'. Below the title is a bulleted list of seven points. At the bottom left is a '</>' symbol, and at the bottom right is a small image of three computer monitors displaying web pages. The footer contains the text 'Developing Responsive Websites with Bootstrap and jQuery', '© APTECH LIMITED', and the number '15'.

- 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

Explain students about autocomplete function in jQuery using slide 15.

1. Autocomplete function provides a list of suggestions that the user can select instead of typing it.
2. It functions similar to drop-down list. You have seen while filling a form, a drop-down menu contains a list of words when a user types it appears and shows the matched word.
3. It filters the options with the matching word as and when user types.
4. jQuery UI is jQuery user interface which is a robust open-source JS library based on jQuery framework.
5. It also provides a collection of jQuery plugins.
6. Web developers can download the jQuery files from the official Website or can use CDN to refer them.

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

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Continue explaining autocomplete function in jQuery using slide 16.

7. jQuery library offers autocomplete() function.

8. Its syntax is:

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

9. When more than one option is to be included then the syntax is:

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

10. There are different options.

- appendTo – Appends an element to the list.
- source – It indicates how the data will be obtained that will match the input.
- delay – It is the waiting time before fetch the matching value. It is in milliseconds.
- miniLength – Number of characters to be typed before matching starts.
- Autofocus – It focuses the first menu item when the value becomes true. Its default value is false.
- disabled – It will inactivate the widget when the value is true. Its default value is false.
- position – it specifies the position of the input element on the list.

Slide 17

Let us understand about widgets in jQuery.

The slide has a blue header bar with the title "Widgets (1-2)". Below the title is a bulleted list of points. To the left of the list is a vertical stack of four white circles, each connected by a thin line to a horizontal blue bar. The circles are labeled "Lifespan", "Interaction", "State", and "Inheritance". The blue bars are positioned above the corresponding list items. The list contains the following points:

- An object associated with a HTML element to handle many aspects
- Aspects are:
 - Lifespan
 - Interaction
 - State
 - Inheritance
- 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

At the bottom left is a small icon of two overlapping circles with arrows. At the bottom right is a small image showing three computer monitors displaying different web pages. The footer of the slide includes the text "Developing Responsive Websites with Bootstrap and jQuery", "© APTECH LIMITED", and the number "12".

Explain students about widgets in jQuery using slide 17.

1. Widgets are referring to an object that is associated with HTML elements for handling many aspects such as lifespan, interaction, state, and inheritance.
2. At the core, it is the visual section of jQuery UI.
3. In jQuery, widgets come from jQuery UI and these are very useful for designing interactive Webpages.
4. As The standard plugins are not enabled with built-in functionalities or capabilities such as regulating the lifespan of plugin, revealing methods, and associating data with its elements.
5. In case of jQuery, the platform is the browser, JS is the language, and jQuery and jQuery UI libraries are the major parts of environment.

Slide 18

Let us understand about widgets in jQuery.

The slide has a blue header bar with the title "Widgets (2-2)". Below the title is a bulleted list: "jQuery widgets are:". A 3x4 grid of 11 blue boxes follows, each containing a widget name. The grid is as follows:

| | | | |
|--------------|----------|-------------|---------------|
| Accordions | Buttons | Tabs | Sliders |
| Autocomplete | Dialogs | Datepickers | Progress bars |
| Menus | Spinners | Tooltip | |

At the bottom left is a double arrow icon (</>). At the bottom right is a small image of four mobile devices. The footer contains the text "Developing Responsive Websites with Bootstrap and jQuery", "© APTECH LIMITED", and "18".

Explain students about widgets in jQuery using slide 18.

Name all the jQuery widgets to students:

1. Accordions
2. Buttons
3. Tabs
4. Sliders
5. Autocomplete
6. Dialogs
7. Datepickers
8. Progress bars
9. Menus
10. Spinners
11. Tooltip

Slide 19

Let us understand about tooltip widgets in jQuery.

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

</>

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Explain students about using tooltip widgets in jQuery using slide 19.

- Tooltip widget comes with fresh themes and facilitates customization.
- It allows displaying other content instead of only title attribute, such as AJAX-retrieved data and footnotes.
- Widgets facilitates alignment of tooltip.
- It offers additional styling for personalizing the appearance. It is useful for indicating a warning or error.
- Its syntax is:

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

Show the students a code snippet for better understanding to how to use widget tooltip.

Code Snippet:*HTML*

```
<label id="lName" for="tName" title="Full Name">Name</label>
<input id="tName" type="text" title="Your full name as it appears in memo"/>
```

jQuery

```
$('#tName').tooltip();
```

There are eight parameters of tooltip method: content, item, disabled, hide, show, track, position, and tooltipClass.

Slide 20

Let us understand about dialog widgets in jQuery.

The slide has a blue header bar with the title "Dialog Widget". Below it is a list of features:

- 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

At the bottom, there is a small image of a computer monitor displaying a web page.

Explain students about dialog widgets using slide 20.

1. Dialog widget provides a floating window that has a title and a body of content.
2. The window is moveable by dragging and resizable by stretching.
3. User can close the dialog by clicking 'X' icon present on the right top corner.
4. The window is dynamic in nature as it displays the scrollbar when it exceeds its maximum height.
5. To display the dialog in jQuery, dialog() method is there.
6. Its syntax is:
`$(selector, context).dialog(opt);`
`$(selector, context).dialog({opt1: val1, opt2: val2.....});`
7. It has the parameters: title, autoOpen, closeOnEscape, buttons, draggable, resizable, modal, and position.

Slide 21

Let us understand about datatable plugins in jQuery.

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

</>

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Explain students about datatable plugins in jQuery using slide 21.

1. Datatable is an intuitive jQuery plugin which facilitates adding more functions to the <table> element.
2. It makes the plain table a dynamic by including functionalities such as – pagination, sorting, and searching.
3. It enables quick access, flexible and user friendly interaction.
4. Its syntax is:
`$(selector).dataTable();`
5. Web developer needs to include only two additional files to use plugins – DataTables JS files, and DataTables CSS files.

Show code snippet for better understanding.

Code Snippet:

```
($('table').dataTable({
    paginate: true,
    scrollY: 400
});
```

In this code, pagination and scrolling utilities are enabled.

Slides 22 to 24

Let us summarize the session.

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.

</>



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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.

</>



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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.

</>

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Using slides 22 to 24 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.

4.3 Post Class Activities for Faculty

You should familiarize yourself with the topics of the next session.

Session 05: Creating Bootstrap Responsive Layout

5.1 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

5.1.1 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

5.1.2 Teaching Skills

To teach this session, you should be well versed with the concepts of grid system. You should be familiar with the Bootstrap responsive layout in detail. You should also know how to create responsive pages with Bootstrap.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities.

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 2

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

</>



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5.2 In-Class Explanations

Slides 3 and 4

Let us introduce Bootstrap Responsive Layout.

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

</>



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Explain students about Bootstrap responsive layout using slide 3.

1. Bootstrap responsive layout refers to the design process of Websites which provide ease of access and smooth viewing on different devices.
2. It is an efficient way of displaying Websites across variety of devices.
3. This responsive layout is adaptive to user interface components and functionality to any screen size of devices.
4. The devices can be – laptop, desktop, smartphones, or tablets.

5. The changing of the layout according to the size of the target device facilitates an optimal view.

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

</>



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4

Continue explaining Bootstrap responsive layout using slide 4

6. This responsive Website has three elements:

- Fluid and proportion-based grids
- Flexible or fluid images
- CSS3 media queries

7. To make the Website adaptable to different environments, grids and multimedia should be flexible and fluid.

8. Media queries are essential for displaying right assets in right manner on devices.

9. Fluid grids are used for sizing the page elements in relative units that is percentages, rather than in absolute units that is, pixels or points.

10. The media queries used to apply different CSS styles on targeted devices.

11. Bootstrap first focus on small screen devices such as mobile devices and then it expands its components for larger screens such as desktops and laptops.

Tell students that there is no requirement of extra style sheet to activate responsive functionality in Bootstrap 3.

Slide 5

Let us understand working with grids in Bootstrap.

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

- Consists of series of containers, rows, and columns

</>

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Explain students about working with grids in Bootstrap using slide 5.

1. In Bootstrap, grid is a collection of HTML/CSS components.
2. This grid in Bootstrap is known as 12-grid system or 12-column layout which creates up to 12 columns and unlimited rows.
3. Columns in this grid system can be re-arranged according to the size of the screen that is why this grid system is responsive in nature.
4. The grid consists of series of containers, rows, and columns.
5. Container has content by setting margins on left and right. There are two types of containers – fixed and fluid.
6. Rows extend from left to right edge of a container and the content is in the columns.
7. The padding of container is eliminated through a margin value of -15 pixels from both the sides.

Slides 6 and 7

Let us understand predefined grid classes.

Predefined Grid Classes (1-2)

- Four classes forming four tiers of grid system

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

</>

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Explain students about predefined grid classes in Bootstrap using slide 6.

There are four classes to form four tiers of grid system in Bootstrap:

1. Xs – for extra small screen size
2. Sm – for small screen size
3. Md – for medium screen size
4. Lg – for large screen size

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

</>

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Continue explaining predefined grid classes in Bootstrap using slide 7.

Show the table of column specifications for different browsers.

The symbol * represents the number of columns in a row.

Slide 8

Let us understand rules of grid system.

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

</>

Explain students about the rules of Bootstrap 3 grid system using slide 8.

1. Containers are a means to middle-align the contents of Website.
2. Rows are horizontal series of columns that are used to properly align the columns. Place the rows within container for proper aligning and padding of rows.
3. Columns hold the content of Website and can be the only direct children of rows.
4. Grid tiers depend on minimum widths that is, they are applicable to all the tiers.
5. Predefined grid classes for columns indicate two things - type of device and number of columns.
6. Predefined grid classes for both rows and columns make grid layout quickly.
7. Columns have gaps between its content which is known as gutters. This is done through padding, which is neutralized for the first and last column in a row via negative margin.

Slide 9

Let us understand basic structure of grid.

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

</>



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Explain students about basic structure of grid using slide 9.

1. The grid structure in Bootstrap has one or more containers, rows, and columns.
2. Web developer should define a container which contains rows and columns.
3. At first, Web developer should define rows within a container by using .row class.
4. Then, Web developer should define columns within a row by using .col-xs-*, .col-sm-*, .col-md-*, and .col-lg-* classes.
5. Finally, these columns are constructed where Web developers can place the content.

Slide 10

Let us understand grids for devices.

Grids for Device

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

| Stacked | Small Devices | Medium Devices | Large Devices |
|--|--|---|---|
| <ul style="list-style-type: none"> • Also known as horizontal grid • Load as a stack first on small screen sized devices | <ul style="list-style-type: none"> • Screen width between 768 and 991 pixels • Use .col-sm-* classes | <ul style="list-style-type: none"> • Screen width between 992 and 1199 pixels • Use .col-md-* classes | <ul style="list-style-type: none"> • Screen width is at least 1200 pixels • Use .col-lg-* classes |

</>



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Explain students about grids for different devices using slide 10.

1. A grid system offers grid layouts that vary with different devices.
2. There are a different split percentage of columns in a row for each device.
3. The four types of grid for different devices are: Stacked or Horizontal, Small, Medium, and Large.

Stacked or Horizontal:

Small Devices:

The screen width of small devices is between 768 and 991 pixels. Web developer should use .col-sm-* classes. It can be split into the percentage ratio of 75/25 or 25/75.

Medium Devices:

The screen width of medium devices is between 992 and 1199 pixels. Web developers should use .col-md-* classes. It can be split into percentage ratio of 50/50.

Large Devices:

The screen width of large devices is at least 1200 pixels. Web developers should use .col-lg-* classes. It can be split into percentage ratio of 33/66.

Slides 11 and 12

Let us understand how to work with headers.

The slide has a blue header bar with the title 'Working with Headers (1-2)'. Below the header, there is a bulleted list of seven items. At the bottom of the slide, there are two boxes: one on the left with the code '</>' and one on the right showing a screenshot of a website with a large header. The footer contains the text 'Developing Responsive Websites with Bootstrap and jQuery', '© APTECH LIMITED', and the number '11'.

- 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

Explain students about working with header in Bootstrap using slide 11.

1. A page header layout component adds a heading to a Webpage.
2. It separates the heading from rest of the page by inserting a horizontal line under the heading.
3. Jumbotron is a layout component which helps in increasing the size of heading text. It also allows adding much space to the content of the Webpage.
4. It is flexible and lightweight component.
5. It helps to extend the whole viewport of the screen to highlight the key informative content.
6. Web developers should use .jumbotron class within <div> element.
7. There are two ways of using this component:

1. Insert it inside <div class="container">, to prevent from extending up to the edges of screen
2. Insert it outside <div class="container">, to extend up to edges of the screen

Working with Headers (2-2)

- Output of Jumbotron inside <div>
- Output of Jumbotron outside <div>

</>

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Continue explaining working with header in Bootstrap using slide 12.

Show to students the outputs of Jumbotron component when placed outside and inside of <div> element.

Slides 13 and 14

Let us understand typography.

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:

</>

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Explain students about typography in Bootstrap using slide 13.

1. Typography classes and elements in Bootstrap offers styling HTML elements.
2. It helps in making text in heading, body, and list more stylish.
3. In Bootstrap, .h1 to .h6 classes are for all corresponding HTML headings.

4. These classes are useful for matching heading font's style and put inline text besides the heading text.
5. Web developers should use .small class for inline sub-heading to display secondary text in smaller size and lighter color.

Show output to students for better understanding.

Code snippet for output mentioned on slide 13 is:

```
<div class="container">
<h1>h1 Text Transformation <small>subordinate text</small></h1>
<h2>h2 Text Transformation <small>subordinate text</small></h2>
<h3>h3 Text Transformation <small>subordinate text</small></h3>
<h4>h4 Text Transformation <small>subordinate text</small></h4>
<h5>h5 Text Transformation <small>subordinate text</small></h5>
<h6>h6 Text Transformation <small>subordinate text</small></h6>
</div>
```

Tell students that Web developers can use the heading classes in other elements to apply the heading style in-between text.

The screenshot shows a presentation slide with a blue header bar containing the title "Typography (2-2)". Below the header, there are two bullet points:

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

Below the bullet points is a screenshot of a web browser window displaying three examples:

- Description Listing:** Shows a `<dl>` structure with items "India" and "Asia" under the key "- A country".
- Keyboard Inputs:** Shows a `<kbd>` tag with the text "User `ctrl + a` to undo".
- Code Highlighting:** Shows a `<code>` tag with the text "</>" highlighted in red.

At the bottom of the slide, there is footer text: "Developing Responsive Websites with Bootstrap and jQuery", "© APTECH LIMITED", and "14".

Explain students about more styles in Bootstrap using slide 14.

Bootstrap also offers styles for description list `<dl>`, inline code snippet `<code>`, and keyboard input text `<kbd>`.

Show output to students for good understanding.

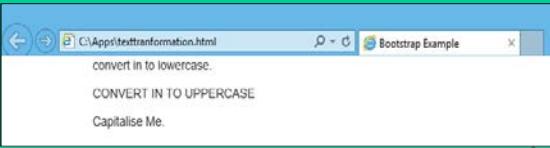
- `<dl>` element provides bold style to the content in `<dt>`.
- `<code>` element highlights the text with background color.
- `<kbd>` element provides new font, black background color, and white text color.

Slide 15

Let us understand text transformation classes.

Text Transformation Classes

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



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Explain students about text transformation classes in Bootstrap using slide 15.

There are three text transformation classes which change the text case in the HTML components:

1. .text-uppercase: Changes each letter in upper case
2. .text-lowercase: Changes each letter in lower case
3. .text-capitalize: Changes first letter of each word in upper case

Show output to students for better understanding.

Slide 16

Let us understand responsive Web designing.

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



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Explain students about responsive Web designing using slide 16.

1. .clearfix class is used to prevent uneven wrapping and organizes the content

2. .visible-sm and .visible-md classes are responsive utility to make content visible on small and medium devices, respectively
3. .visible-sm-block class is used for displaying content through media queries on targeted devices

Web developer can use one or more classes for toggling content across variety of viewport breakpoints.

Slides 17 to 19

Let us summarize the session.

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.

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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.

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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.

</>

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19

Using slides 17 to 19 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.

5.3 Post Class Activities for Faculty

You should familiarize yourself with the topics of the next session.

Session 06: Creating Responsive Webpages Using Bootstrap and jQuery

6.1 Pre-Class Activities

Before you commence the session, you should familiarize yourself with the topics of this session in-depth. Prepare a question or two that will be a key point to relate the current session objectives.

6.1.1 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

6.1.2 Teaching Skills

To teach this session, you should be well versed with the concepts of tables in Bootstrap. You should be familiar with the tabs in detail. You should also know how to create a Website with the help of Bootstrap and jQuery.

You should teach the concepts in the theory class using the images provided. For teaching in the class, you are expected to use slides and LCD projectors.

Tips:

It is recommended that you test the understanding of the students by asking questions in between the class.

In-Class Activities

Follow the order given here during In-Class activities.

Overview of the Session

Give the students an overview of the current session in the form of session objectives. Read out the objectives given on slide 2.

Slide 2

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

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6.2 In-Class Explanations**Slides 3 and 4**

Let us introduce media queries.

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 than 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

</>



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Explain students about roles of media queries in responsive layouts using slide 3.

1. Define media query – It refers to a style rule used to display Website on specific type of device without changing markups.
2. Media query helps in adding responsive CSS to a Bootstrap application. Basically, it defines device specific style sheet.

3. In CSS2, media queries define stylesheets for computer screens, TV-type gadgets, handheld devices, and printers.
4. In CSS3, media queries extend the concept of CSS2 media types and focus on characteristics of devices rather than type of devices.
5. Media queries are useful in defining physical properties of devices: viewport's and device's width and height, screen resolution, and orientation such as portrait, and landscape.
6. A breakpoint is a pixel width at which the layout of the Webpage adjusts to display better on the targeted devices.

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

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Using slide 4 explain that in Bootstrap, media queries are defined in a file `bootstrapresponsive.css`. This file is located in CSS folder under assets folder.

This file specifies the breakpoints in a grid system.

Show code snippet to students for clear understanding.

```

/* Portrait phones and smaller */
@media (max-width: 480px) {}

/* Landscape phones and portrait tablets */
@media (max-width: 767px) {}

/* Portrait tablets and small desktops */
@media (min-width: 768px) and (max-width: 991px) {}

/* Landscape tablets and medium desktops */
@media (min-width: 992px) and (max-width: 1199px) {}

/* Large desktops and laptops */
@media (min-width: 1200px) {}
```

This code is showing the implementation of media queries in Bootstrap.

Tell students that a Web developer can insert several breakpoints as per the requirements.

Slides 5 and 6

Let us understand tables in Bootstrap.

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 slide shows a screenshot of a web browser displaying a basic Bootstrap table. The table has three rows with the following data:
 Row 1: Firstname: Stella, Lastname: Mark, City: smark@example.com
 Row 2: Firstname: Josie, Lastname: Fernandes, City: josie@example.com
 Row 3: Firstname: Jack, Lastname: Doe, City: jdoe@example.com

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Explain students about tables in Bootstrap using slide 5.

1. Tables in Bootstrap are used to display data in a grid layout of rows and columns.
2. Bootstrap provides built-in classes for improving appearance.
3. A basic table contains horizontal splitters and slight padding of 8 pixels.

Tables (2-2)

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

| | | | |
|----------------------------|----------------------------|------------------------------|-------------------------|
| <code><table></code> | <code><thead></code> | <code><tbody></code> | <code><tr></code> |
| <code><td></code> | <code><th></code> | <code><caption></code> | |

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



The slide shows a screenshot of a web browser displaying a basic Bootstrap table. The table has three rows with the following data:
 Row 1: Firstname: Stella, Lastname: Mark, City: smark@example.com
 Row 2: Firstname: Josie, Lastname: Fernandes, City: josie@example.com
 Row 3: Firstname: Jack, Lastname: Doe, City: jdoe@example.com

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Using slide 6 explain that Bootstrap provides a clear layout for creating a table with elements: <table>, <thead>, <tbody>, <tr>, <th>, <td>, and <caption>.

The standard order of table tags are:

1. <table>
2. <tbody>
3. <tr>
4. <td>

In case of column headers, the order is:

1. <thead>
2. <tr>
3. <th>

Slide 7

Let us understand striped rows.

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:

| Sl no | Car Name | Manufacturer Name | Year manufactured |
|-------|----------|-------------------|-------------------|
| 1 | Swift | Maruti | 2008 |
| 2 | Polo | Volkswagen | 2009 |
| 3 | Duster | Renault | 2012 |

</>

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7

Explain students about striped rows in a Bootstrap table using slide 7.

1. In Bootstrap, Web developer can create a table with alternate rows having background color different from previous one.

2. Web developer should use `.table-striped` class and add to `.table` base class.

Show output to students for clear understanding.

Slide 8

Let us understand bordered table.

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:

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

</>

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Explain students about bordered tables in Bootstrap using slide 8.

In Bootstrap, Web developers can enable bordered table which is a border on all sides of the table.

Show output to students for good understanding.

Slide 9

Let us understand hover effects on table rows.

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:

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

</>

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Explain students about hover effects on table rows using slide 9.

When a user moves a mouse on a row it means mouse hover on a table row, it gets in gray background. Bootstrap allows hover effects on table rows. Web developer should use .table-hover class to .table base class.

Show output to students for good understanding.

Slide 10

Let us understand condensed tables.

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:

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

</>



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Explain students about condensed tables or compact tables in Bootstrap using slide 10. Bootstrap allows utility of condensed tables which helps in reducing cells padding by half. It saves spaces around the cells. Web developers should use .table-condensed class to .table base class.

Show output to students for better understanding.

Slide 11

Let us understand emphasis on tables.

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.

</>



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Explain students about emphasis on tables using slide 11.

In Bootstrap there are few contextual classes that are used for emphasizing a cell or an entire row of a table. It indicates success, warning, info, or danger by changing row or cell background color.

The contextual classes in Bootstrap are: .active, .success, .info, .warning, and .danger changes to gray, green, blue, yellow, and red respectively.

These classes are added to .table base class.

Slide 12

Let us understand responsive tables.

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:



</>



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Explain students about responsive tables using slide 12.

In Bootstrap 3, Web developers can create responsive tables which activate horizontal scrolling on small screen. Its screen width is not more than 768 pixels. The same responsive table on large screen will not show any difference. Web developers should use .table-responsive class. Show the outputs of responsive tables on small screen and large screen for good understanding.

Slide 13

Let us understand customizing Bootstrap.

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:

The slide shows a screenshot of a web browser displaying a responsive application. The application has a header with tabs for 'Course Name' and 'Developed By'. Below the header is a table with three rows. The first row contains 'Java' and 'James Gosling'. The second row contains 'Ruby' and 'Yukihiro Matz'. The third row contains 'Python' and 'Guido van Rossum'. To the right of the table, there is a brief description of each language. At the bottom of the slide, there is footer text: 'Developing responsive Websites with Bootstrap and jQuery' and '© APTECH LIMITED'.

Explain students about customizing Bootstrap using slide 13.

Twitter Bootstrap is now a popular CSS framework to develop Web applications because it helps in saving much time for developers. The official Website of Bootstrap offers custom builder for generating personal Bootstrap package.

It is efficient to override CSS file to code the desired styles. This mechanism prevents deviation from normal workflow and provides hassle-free upgradation.

Show output to students for better understanding.

Slide 14

Let us understand about Bootstrap wells.

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 classes .well-lg and .well-sm
- Render a well smaller or larger as per defined base class
- Output of smaller, default, and larger well:

```
</>
```

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Explain students about Bootstrap wells using slide 14.

Bootstrap well is a container component to apply inset style. It is used to insert content inside a box. Web developers wrap content inside <div> element using .well class. It changes the well's size by controlling its padding.

These render smaller or larger well depending on the base class that developer specifies.

Show output of smaller, default, and larger well to students for quick understanding.

Tell students that to avoid a collapsing parent while having floated content inside a well, add .clearfix and .well classes.

Slide 15

Let us understand about tabs in bootstrap wells.

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:

```
</>
```

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Explain students about tabs in Bootstrap well using slide 15.

Bootstrap offers tabbed interface within a well. Tabs contain series of tabs, drop-down menus, or combination of both. Web developers should use .nav-tabs class to .nav base class with tag.

Show output to students for better understanding.

Slide 16

Let us understand how to build a Website.

The slide has a blue header bar with the title 'Building a Website'. The main content area is green and contains a bulleted list of five points:

- 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

At the bottom left is a '</>' symbol, and at the bottom right is a small image of three computer monitors displaying web pages. The footer contains the text 'Developing Responsive Websites with Bootstrap and jQuery', 'APTECH LIMITED', and '16'.

Explain students about building a Website using jQuery and Bootstrap using slide 16.

Using jQuery with Bootstrap used to design robust and dynamic Webpages.

It is simple to use and quick to design Website which is compatible to multiple browsers.

Bootstrap includes containers, form, or form controls in a Webpage and jQuery provides the functionalities to all these components.

Slides 17 to 19

Let us summarize the session.

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.

</>



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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.

</>



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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.

</>



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Using slides 17 to 19 summarize the important topics learnt at the end of this session. Use these pointers to reinforce some essential concepts and provide a quick recap.

Next, let us check your understanding of the topics covered so far in this session.