

Front-End Web UI Frameworks and Technology Tools

ECAP916

Edited by
Dr. Ajay Bansal



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Dr. Ajay Bansal**

CONTENT

Unit 1:	Introduction to Bootstrap	1
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 2:	GIT	14
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 3:	NodeJS and NPM	25
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 4:	Responsive Design	39
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 5:	Navigation	53
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 6:	Navigability Elements	63
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 7:	Bootstrap CSS	74
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 8:	Forms	87
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 9:	Tabs and Pills	100
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 10:	Collapse and Modals	111
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 11:	Tooltips	123
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 12:	JQuery	138
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 13:	SASS	149
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	
Unit 14:	NPM Scripts	166
	<i>Prikshat Kumar Angra, Lovely Professional University</i>	

Unit 01: Introduction to Bootstrap

CONTENTS

Objectives

Introduction

- 1.1 Bootstrap 4 Advantages
- 1.2 Applications of Bootstrap
- 1.3 Where to Get Bootstrap?
- 1.4 Bootstrap CDN
- 1.5 Web Design, Grid System, Header Section
- 1.6 Bootstrap Forms
- 1.7 Bootstrap Modals and Bootstrap Carousel
- 1.8 Bootstrap 4 Modal

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Recognize front-end web framework
- Understand bootstrap
- Analyze UI development

Introduction

There are several reasons to use Bootstrap but let me boil it down to a few of the key reasons I recommend it. If you're like me, you're constantly starting new web projects. One of the most frustrating parts of getting a project off the ground is to reinvent the base HTML, CSS, and JavaScript for each project. It makes much more sense to reuse the same base code and then build on top of it. Some developers may prefer to write their own framework, and in some cases, this may make sense. However, with most projects, it has been found that it is easier to just use an existing framework. On top of the components that Bootstrap provides out-of-the-box, there are hundreds of other third-party components you can integrate with, with a large community of other developers to help you.

In the startup environment, Bootstrap is also a potent prototype tool. You'll frequently want to evaluate a concept without devoting a lot of effort to it. With Bootstrap, you can quickly create a prototype to test your idea without spending a lot of time creating a front end that you might not use.

1.1 Bootstrap 4 Advantages

1. The first and foremost advantage of using Bootstrap is that it is very easy to use and implement. If a person has some basic knowledge of HTML and CSS, that user can easily use Bootstrap.
2. The fact that Bootstrap can adapt to the size of any phone, tablet, desktop and so on is also very interesting feature.
3. Bootstrap 4 is also useful because it is compatible with all modern browsers which include Google Chrome, Firefox, Internet Explorer 10+, Edge, Safari, and Opera.
4. It also produces less cross-browser bugs.
5. It is light weighted and consequently it can be widely used as a framework for creating responsive sites.
6. Lastly, Bootstrap 4 is a very simple and yet very effective grid system.

1.2 Applications of Bootstrap

- **Scaffolding:** Bootstrap provides a basic structure with Grid System, link styles, and background.
- **CSS:** Bootstrap comes with the feature of global CSS settings, fundamental HTML elements styled and enhanced with extensible classes, and an advanced grid system.
- **Components:** Bootstrap contains over a dozen reusable components built to provide iconography, dropdowns, navigation, alerts, pop-overs, and much more.

1.3 Where to Get Bootstrap?

Bootstrap is open-source software and it can be downloaded from getbootstrap.com

If you want to download and host Bootstrap yourself, go to getbootstrap.com, and follow the instructions there.

OR:

Include Bootstrap from a CDN

- If you don't want to download and host Bootstrap yourself, you can include it from a CDN (Content Delivery Network).
- MaxCDN provides CDN support for Bootstrap's CSS and JavaScript. You must also include jQuery.

1.4 Bootstrap CDN

You must include the following Bootstrap's CSS, JavaScript, and jQuery from MaxCDN into your web page.

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

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

```
<!-- latest jQuery library -->
<script src="https://code.jquery.com/jquery-latest.js"></script>
```

Advantage of Using Bootstrap CDN

- Many users already have downloaded Bootstrap from MaxCDN when visiting another site.
- As a result, it will be loaded from cache when they visit your site, which leads to faster loading time.
- Also, most CDN's will make sure that once a user requests a file from it, it will be served from the server closest to them, which also leads to faster loading time.

Create Web Page with Bootstrap

Add the HTML5 doctype

Bootstrap uses HTML elements and CSS properties that require the HTML5 doctype. Always include the HTML5 doctype at the beginning of the page, along with the lang attribute and the correct character set:

Bootstrap uses HTML elements and CSS properties that require the HTML5 doctype. Always include the HTML5 doctype at the beginning of the page, along with the lang attribute and the correct character set:

```
<!DOCTYPE html>

<html lang="en">
  <head>
    <meta charset="utf-8">
  </head>
</html>
```

Create Web Page with Bootstrap

Bootstrap 3 is designed to be responsive to mobile devices. Mobile-first styles are part of the core framework.

Bootstrap is mobile-first

To ensure proper rendering and touch zooming, add the following <meta> tag inside the <head> element:

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

Bootstrap is mobile-first

The width=device-width part sets the width of the page to follow the screen-width of the device (which will vary depending on the device).

The initial-scale=1 part sets the initial zoom level when the page is first loaded by the browser.

Containers

Bootstrap also requires a containing element to wrap site contents.

There are two container classes to choose from:

The .container class provides a responsive **fixed width container**.

The .container-fluid class provides a **full width container**, spanning the entire width of the viewport.



Example: Containers are not nestable (you cannot put a container inside another container).

Bootstrap Grids

Bootstrap's grid system allows up to 12 columns across the page.

If you do not want to use all 12 columns individually, you can group the columns together to create wider columns:

```
<div class="col-md-12">Span 12 columns</div>
```



```
<div class="col-md-6">Span 6</div><div class="col-md-6">Span 6</div>
<div class="col-md-4">Span 4</div><div class="col-md-8">Span 8</div>
<div class="col-md-4">Span 4</div><div class="col-md-4">Span 4</div><div class="col-md-4">Span 4</div>
```

Bootstrap's grid system is responsive, and the columns will re-arrange automatically depending on the screen size.

Grid Classes

The Bootstrap grid system has four classes:

- xs (for phones)
- sm (for tablets)
- md (for desktops)
- lg (for larger desktops)

The classes above can be combined to create more dynamic and flexible layouts.

```
<!DOCTYPE html>
<html lang="en">
<head><meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
<title>Any title</title>
</head>
<body>
//write code
</body>
</html>
```

Add the HTML 5 doctype:

Bootstrap uses HTML elements and CSS properties, so you have to add the HTML 5 doctype at the beginning of the page with lang attribute and correct character set.

- Bootstrap 3 is designed to be responsive to mobile devices.
- Mobile-first styles are part of the core framework of Bootstrap. You have to add the following <meta> tag inside the <head> element for proper rendering and touch zooming:



Note: The "width=device-width" part is used to set the width of the page to follow the screen-width of the device (vary according to the devices).

The initial-scale=1 part is used to set the initial zoom level when the page is first loaded by the browser.

Bootstrap is mobile friendly

Bootstrap 3 is designed to be responsive to mobile devices. Mobile-first styles are part of the core framework of Bootstrap. You have to add the following <meta> tag inside the <head> element for proper rendering and touch zooming:

The "width=device-width" part is used to set the width of the page to follow the screen-width of the device (vary according to the devices). The initial-scale=1 part is used to set the initial zoom level when the page is first loaded by the browser.

Bootstrap Navigation bar

- A navigation bar is like a navigation header that is placed at the top of the page. You can collapse or extend it according to the screen size.



Basic Navbar Example

A navigation bar is a navigation header that is placed at the top of the page.

Creating a standard navigation bar at the top of the page with:

`<NAV CLASS="NAVBAR NAVBAR-DEFAULT">`.

Bootstrap Inverted Navigation Bar

- Inverted navigation bar provides an alternative black navbar. It can be used to style the default navigation bar by changing. navbar-**default class** into. navbar-**inverse class**.



Inverted Navbar

An inverted navbar is black instead of gray.

1.5 Web Design,Grid System,Header Section

Typography

Bootstrap's global default font size is 14px, with a line height of 1.428. This is applied to the `<body>` element and all paragraphs (`<p>`). In addition, all `<p>` elements have a bottom margin that equals half their computed line-height (10px by default).

<code>.font-weight-bold</code>	Bold text
<code>.font-weight-bolder</code>	Bolder text
<code>.font-italic</code>	<i>Italic text</i>
<code>.lead</code>	Makes a paragraph stand out
<code>.text-uppercase</code>	Indicates uppercased text
<code>.text-left</code>	Indicates left-aligned text

Background Colors

The classes for background colors are

- `bg-primary`,
- `.bg-success`,
- `.bg-info`, `.bg-warning`,
- `.bg-danger`,
- `.bg-secondary`,
- `.bg-dark` and
- `.bg-light`.

The classes for text colors are:

- `.text-muted`, `.text-primary`,
- `.text-success`, `.text-info`,
- `.text-warning`, `.text-danger`,
- `.text-secondary`, `.text-white`, `.text-dark`, `.text-body` (default body color/often black) and `.text-light`

1.6 Bootstrap Forms

In Bootstrap, there are three types of form layouts:

- Vertical form (this is default)
- Horizontal form
- Inline form

There are three standard rules for these 3 form layouts:

Always use `<form role="form">` (helps improve accessibility for people using screen readers)

Wrap labels and form controls in `<div class="form-group">` (needed for optimum spacing)

Add class `.form-control` to all textual `<input>`, `<textarea>`, and `<select>` elements

Vertical Form Example

Email address

Password

Bootstrap Inline Form

In an inline form, all of the elements are inline, left-aligned, and the labels are alongside.

Note: This only applies to forms within viewports that are at least 768px wide!

Additional rule for an inline form:

Add class `.form-inline` to the `<form>` element

A horizontal form means that the labels are aligned next to the input field (horizontal) on large and medium screens. On small screens (767px and below), it will transform to a vertical form (labels are placed on top of each input).

Horizontal form

Additional rules for a horizontal form:

Add class `.form-horizontal` to the `<form>` element

Add class `.control-label` to all `<label>` elements

Tip: Use Bootstrap's predefined grid classes to align labels and groups of form controls in a horizontal layout.

Bootstrap Badges and Labels

Badges are numerical indicators of how many items are associated with a link:



The numbers (5, 10, and 2) are the badges. Use the `badge` class within `` elements to create badges. Badges can also be used inside other elements, such as buttons:



Labels

Labels are used to provide additional information about something:

Use the `label` class, followed by one of the six contextual classes: `label-default`, `label-primary`, `label-success`, `label-info`, `label-warning` or `label-danger`, within a `` element to create a label:

1.7 Bootstrap Modals and Bootstrap Carousel

A carousel in Bootstrap 4 can be defined as a slideshow that is used for the purpose to slideshow through a series of content to show the audience the content and to enhance the website. A carousel can also be called as slideshow or image slider.

It can be regarded as one of the best ways of displaying the large number of contents inside a small space on a web page.

A carousel can be created in four main ways, which are

- Using slides only
- Using controls
- With the indicators
- With the captions

This carousel only contains slides. The class `carousel-inner` is used to add different slides to the carousel. In this, two little arrows will be added to the slides which can help a user to manually switch to any slide in the carousel.

.carousel-control-prev class - It inserts a left or previous button to the carousel, that will give access to the user to go back between the slides.

.carousel-control-next class - It inserts a right or next button to the carousel that will give access to the user to go forward between the slides.

.carousel-control-prev-icon class - It can be used along with the `.carousel-control-prev` in order to create a previous button.

.carousel-control-next-icon class - It can be used along with the `.carousel-control-next` to create a "next" button

Indicators

The `.carousel-indicators` is the class that can be used to add indicators for the carousel. The indicators in this class are used to indicate how many slides are in the carousel, and which slide the user is currently viewing.

Captions

A user can also add captions to their slides in Bootstrap 4. A caption can be easily used to convey to the audience of the website that what exactly is happening in the carousel. For the purpose of adding captions, a user has to add elements inside `<div class="carousel-caption">` within each `<div class="carousel-item">` in order to create a caption for every slide.

1.8 Bootstrap 4 Modal

The Modal component is a dialog box/popup window that is displayed on top of the current page

Creating a modal

```
<!-- The Modal -->
<div class="modal" id="myModal">
  <div class="modal-dialog">
    <div class="modal-content">
      <!-- Modal Header -->
      <div class="modal-header">
        <h4 class="modal-title">Modal Heading</h4>
        <button type="button" class="close" data-dismiss="modal">&times;</button>
      </div>
      <!-- Modal body -->
```



```
<div class="modal-body">
    Modal body..
</div>
<!-- Modal footer -->
<div class="modal-footer">
<button type="button" class="btn btn-danger" data-dismiss="modal">Close</button>
</div>
```

Grid

Furthermore, Bootstrap provides a grid system, which creates a page layout through a series of rows and columns that can place the content. There is no Grid system in CSS.

Designing Classes

Also, Bootstrap contains already designed classes. The programmer can use them in his program to add styling to the elements without writing code from the beginning. On the other hand, in CSS, the programmer should write the code from scratch.

Considering the usage, the Bootstrap helps to create responsive designs that are more presentable while CSS helps to create presentable webpages. Bootstrap and CSS help to build presentable user interfaces. The basic difference between Bootstrap and CSS is that the Bootstrap is a front-end framework while CSS is a style sheet language. They help to add background and borders, text effects, 2D, 3D animations etc. to web pages.

Bootstrap Auto-layout Columns

Creating equal width columns for all devices (x-small, small, medium, large, x-large, and xx-large) through simply using the class .col, without specifying any column number.

```
<div class="container">
<!--Row with two equal columns-->
<div class="row">
<div class="col">Column one</div>
<div class="col">Column two</div></div>
<!--Row with three equal columns-->
<div class="row">
<div class="col">Column one</div>
<div class="col">Column two</div>
<div class="col">Column three</div>
</div>
</div>
```

Summary

- Bootstrap is a free front-end framework for faster and easier web development. It also gives you the ability to easily create responsive designs.
- Content delivery network (CDN) is a system of distributed servers (network) that deliver webpages and other Web content to a user based on the geographic locations of the user, the origin of the webpage and a content delivery server.
- A caption can be easily used to convey to the audience of the website that what exactly is happening in the carousel

- Bootstrap provides a grid system, which creates a page layout through a series of rows and columns that can place the content. There is no Grid system in CSS.
- Bootstrap's global default font-size is 14px, with a line-height of 1.428. This is applied to the `<body>` element and all paragraphs (`<p>`).
- Bootstrap 4 is designed to be responsive to mobile devices. Mobile-first styles are part of the core framework of Bootstrap. You have to add the following `<meta>` tag inside the `<head>` element for proper rendering and touch zooming:

Keywords

Bootstrap: Bootstrap is a free front-end framework for faster and easier web development. It also gives you the ability to easily create responsive designs.

Carousel -A carousel in Bootstrap 4 can be defined as a slideshow that is used for the purpose to slideshow through a series of content to show the audience the content and to enhance the website

CSS- Bootstrap comes with the feature of global CSS settings, fundamental HTML elements styled and enhanced with extensible classes, and an advanced grid system

Grids- Bootstrap provides a grid system, which creates a page layout through a series of rows and columns that can place the content.

Containers- Containers are not nestable (you cannot put a container inside another container).

Bootstrap Inline: In an inline form, all of the elements are inline, left-aligned, and the labels are alongside

Navigation Bar- A navigation bar is like a navigation header that is placed at the top of the page. You can collapse or extend it according to the screen size

Inverted Navigation Bar: Inverted navigation bar provides an alternative black navbar. It can be used to style the default navigation bar by changing. `navbar-default class` into. `navbar-inverse class`.

SelfAssessment

1. Which of the following class in Bootstrap is used to provide a responsive fixed width container?
 - A. `.container-fixed`
 - B. `.container-fluid`
 - C. `.container`
 - D. All of the above
2. Is Bootstrap 4 mobile-first?
 - A. True
 - B. False
 - C. Can't say
 - D. May be
3. How many columns are allowed in a bootstrap grid system?
 - A. 2
 - B. 12
 - C. 3

- D. 5
4. What are advantages of Bootstrap
- A. Easy to use
 - B. Responsive
 - C. Mobile first
 - D. All of the above
5. What is full form of CDN
- A. Content Direct Network
 - B. Content Delivery Network
 - C. Content Delivery Node
 - D. Create Delivery Network
6. Which of the following class in bootstrap is used to create a big box for calling extra attention?
- A. .box
 - B. .container
 - C. .container-fluid
 - D. .jumbotron
7. The correct syntax of creating a standard navigation bar is -
- A. <nav class="navigationbar navbar">
 - B. <nav class="navbar navbar-default">
 - C. <nav class="nav navbar">
 - D. <nav class="navbar default">
8. Which class in Bootstrap Grid System used for phones:
- A. Xs
 - B. Sm
 - C. Md
 - D. Lg
9. Which class in Bootstrap Grid System used for tablets:
- A. Xs
 - B. Sm
 - C. Md
 - D. Lg
10. Which class in Bootstrap Grid System used for desktops:
- A. Xs
 - B. Sm

- C. Md
 - D. Lg
11. Which class in Bootstrap Grid System used for larger desktops:
- A. Xs
 - B. Sm
 - C. Md
 - D. Lg
12. Which is default form layout in Bootstrap
- A. Vertical form
 - B. Horizontal form
 - C. Inline form
 - D. None of these
13. _____ are used to provide additional information about something
- A. Labels
 - B. Badges
 - C. Headings
 - D. None of these
14. A _____ can also be called as slideshow or image slider
- A. Carousel
 - B. Labels
 - C. Badges
 - D. Headings
15. A carousel can be created using:
- A. Using slides only
 - B. Using controls
 - C. With the indicators
 - D. All of the above

Answers for Self Assessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 2. A | 3. B | 4. D | 5. B |
| 6. D | 7. B | 8. A | 9. B | 10. C |
| 11. D | 12. A | 13. A | 14. A | 15. D |

Review Questions

1. Explain why Bootstrap is preferred for website development?
2. What is Bootstrap Grid System? Explain with an example?
3. Explain the typography and links in Bootstrap
4. What is media object in Bootstrap and what are their types
5. Explain the uses of carousel plugin in Bootstrap.
6. What are the bootstrap media objects?
7. What are Bootstrap panels? Explain how to create a Bootstrap panel with a heading
8. What are Bootstrap alerts?
9. What is navigation Bar?
10. What is Inverted Navigation Bar?



Further Readings

- Bootstrap in 24 Hours, Sams
- Silvio Moreto, Bootstrap 4 By Example
- Learning Bootstrap 4 Second Edition, Matt Lambert



Web Links

- <https://getbootstrap.com/>
- [https://en.wikipedia.org/wiki/Bootstrap_\(front-end_framework\)](https://en.wikipedia.org/wiki/Bootstrap_(front-end_framework))

Unit 02: GIT

CONTENTS

Objectives

Introduction

2.1 GIT

2.2 GIT basic commands

2.3 What is Full Stack developer

2.4 Starting a GIT Basics Project

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand GIT
- Execute basic commands of git
- Analyze linking git with cloud repository
- Understand full stack developer

Introduction

Git is a free and open-source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is easy to learn and has a tiny footprint with lightning-fast performance. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like cheap local branching, convenient staging areas, and multiple workflows.

2.1 GIT

Git is a contemporary distributed version control system that is used extensively worldwide. It was created to manage tasks quickly and effectively. We can keep track of and collaborate with our team members in the same workspace thanks to the version control system.

Git is a free and open-source version control system, originally created by Linus Torvalds in 2005. Unlike older centralized version control systems such as SVN and CVS, Git is distributed: every developer has the full history of their code repository locally. This makes the initial clone of the repository slower, but subsequent operations such as commit, blame, diff, merge, and log dramatically faster. Git is a distributed version management system that is open-source. It is made to manage small to large jobs quickly and effectively. It was created to organize the development team's work. We can keep track of each other's work and collaborate in the same workspace thanks to version control.

**Did you Know?**

Git is created by Linus Torvalds in 2005.

How Git works.

1. Create a "repository" (project) with a git hosting tool (like Bitbucket)
2. Copy (or clone) the repository to your local machine
3. Add a file to your local repo and "commit" (save) the changes
4. "Push" your changes to your main branch
5. Make a change to your file with a git hosting tool and commit
6. "Pull" the changes to your local machine
7. Create a "branch" (version), make a change, commit the change
8. Open a "pull request" (propose changes to the main branch)
9. "Merge" your branch to the main branch

2.2 GIT basic commands

Git commands are a distributed version control system for tracking changes in any set of files. They were originally designed for coordinating work among programmers who were operating source codes during software development.

Git is a fast, scalable, and distributed revision control system with an unusually rich command set that provides both high-level operations and full access to internals.

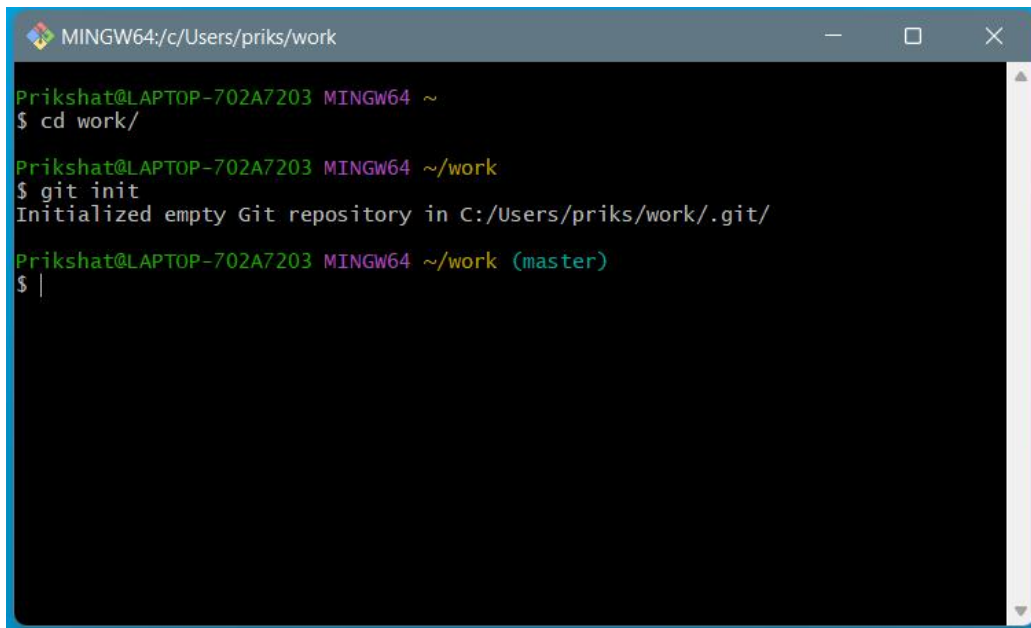
Let's see the following are Git commands discussed with their proper syntax and execution.

- git init
- git add
- git commit
- git status
- git remote
- git push
- git clone

git init

Usage: git init [repository name]

To start a Git repository for our local project folder, we must navigate to the project directory and use the command git init. In order to keep its files structured in other subdirectories, Git will create a hidden.git directory and use it.

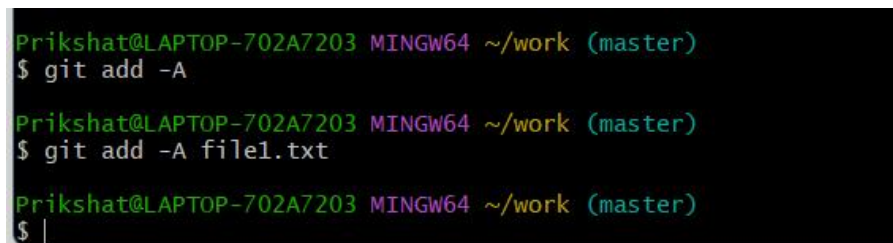


```
MINGW64; c:/Users/priks/work
Prikshtat@LAPTOP-702A7203 MINGW64 ~
$ cd work/
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work
$ git init
Initialized empty Git repository in C:/Users/priks/work/.git/
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ |
```

git add

Usage (i): git add [file(s) name]

This will add the specified file(s) into the Git repository, the staging area, where they are already being tracked by Git and now ready to be committed.




```
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ git add -A
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ git add -A file1.txt
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ |
```

git commit

Usage: git commit -m "message"

This command records or snapshots files permanently in the version history. All the files, which are there in the directory right now, are being saved in the Git file system.



```
Prikshtat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ git commit -m "Committing file1.txt in work"
[master (root-commit) fd64216] Committing file1.txt in work
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 file1.txt
```

Before executing the git commit command, it is required that you logged in with your email id on GitHub (<https://github.com/>). For login using Git Bash following commands used

1. git config user.name "<username> "
2. git config user.email "<user email>"

Git status

Usage: git status

This command will show the modified status of an existing file and the file addition status of a new file, if any, that has to be committed.


```
Prikshat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ git status
On branch master
nothing to commit, working tree clean
```

git push


Usage: git push origin [branch name]

Suppose, we have made some changes in the file and want to push the changes to our remote repository on a particular branch. By using the command 'git push,' the local repository's files can be synced with the remote repository on Github.

Before executing the git push command, it is required to add the origin of the remote repository.

git remote add origin <https://github.com/prikshat/sample.git>





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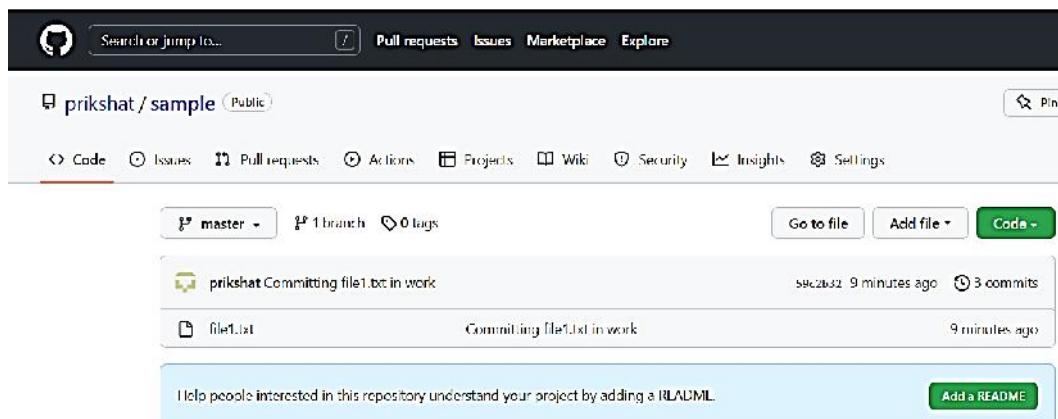


Authentication Succeeded

You may now close this tab and return to the application.

```
Prikshat@LAPTOP-702A7203 MINGW64 ~/work (master)
$ git push -u origin master
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (9/9), 665 bytes | 221.00 KiB/s, done.
Total 9 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/prikshat/sample.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin/master'.
```

After push



git clone

Usage: git clone [URL]

This command is used to clone (download) remote repository data on a local computer.

Find the repository link on the website.



Goto Git bash and then fire following commands

```
mkdir [directory- name]
cd [directory- name]
git clone [URL]
```

Linking GIT with cloud repository

1. Go the Configure Git settings in your Looker Instance
2. For Repository URL put in the URL of the repository you want to use starting with ssh://...
You can generate this by clicking **Clone** and selecting **SSH Authentication** in your Cloud Source Repositories. Make sure to cut off the 'git clone ' bit from the link. It should have a format like the below
ssh://<USERNAME>@source.developers.google.com:2022/p/<PROJECT NAME>/r/<REPOSITORY NAME>
3. For Git Hosting Service select 'Custom Git Configuration' and click continue
4. Copy the SSH key that Looker generates in the next screen for you.
5. In Cloud Source Repositories open the Manage SSH Keys page, click **Register SSH key**. Here you give the key a unique name and paste the key value from Looker and click **Register**.
6. Once the key is registered you go back to your Looker instance and click **Test and Finalize Setup**.

2.3 What is Full Stack developer

Full Stack Developer is an engineer who works on both client-side and server-side of the software application. This type of developer works on the Full Stack of a software application meaning Front end development, Back end development, Database, Server, API, and version controlling systems. Hence, the name "Full Stack" Developer.

A Full-Stack Developer doesn't necessarily master all technologies. However, the professional is expected to work on the client as well as server sides and understand what is going on when developing an application. He or she should have a genuine interest in all software technologies.

2.4 Starting a GIT Basics Project

Following steps are involved to start a basic project using Git.

Step 1: Install Git and Create a GitHub Account



Online link for download git

[Git - Downloads \(git-scm.com\)](https://git-scm.com/)

After installing Git on your machine, the next step is to create a free GitHub account.

Follow these steps:

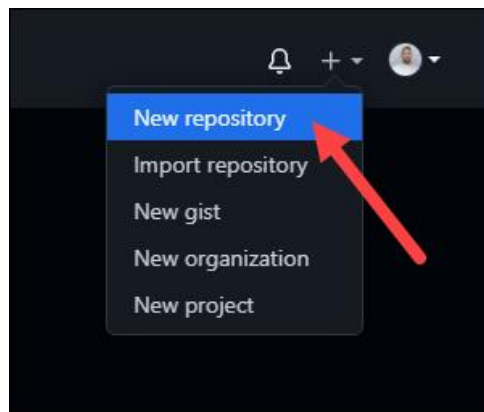
1. Visit the official account creation page: [Join GitHub](#)
2. Pick a **username**, enter your **email address**, and choose a **password**.
3. Opt for or opt out of receiving updates and announcements by checking/unchecking the **Email preferences** checkbox.
4. Verify you're not a robot by solving the **Captcha** puzzle.
5. Click **Create account**.

Step 2: Create a Local Git Repository.

Step 3: Create a New Repository on GitHub

Follow these steps to create a new repository on GitHub:

1. Log in and browse to the GitHub home page.
2. Find the **New repository** option under the + sign next to your profile picture, in the top right corner.



3. Enter a name for your repository, provide a brief description, and choose a privacy setting.

A screenshot of the 'Create a new repository' form on GitHub. The form has a dark background. At the top, it says 'Create a new repository' and 'A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.' Below this, there are two input fields: 'Owner' with a dropdown menu showing 'bosko-pnap' and 'Repository name' with a text input containing 'new-project' and a green checkmark. A red arrow points to the 'Repository name' field. Below these fields, there is a text input for 'Description (optional)' containing 'A new test repository.' with a red arrow pointing to it. At the bottom, there are two radio button options: 'Public' (selected) and 'Private'. The 'Private' option has a red arrow pointing to it. The 'Public' option has a description: 'Anyone on the internet can see this repository. You choose who can commit.' The 'Private' option has a description: 'You choose who can see and commit to this repository.'

Step 4: Add a File to the Repository

Step 5: Unstage Files on Git

Step 6: Create a Commit

Summary

- git init will create a new local GIT repository.
- git clone is used to copy a repository. If the repository lies on a remote server.
- git add is used to add files to the staging area.
- git commit will create a snapshot of the changes and save it to the git directory.
- Full Stack Developer is an engineer who works on both client-side and server-side of the software application.

Keywords

Git: Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency also called global information tracker.

GitHub: A GitHub repository can be used to store a development project. It can contain folders and any type of files (HTML, CSS, JavaScript, Documents, Data, Images).

Repository: A repository is like a data structure used by VCS to store metadata for a set of files and directories.

Full Stack developer: Full Stack Developer is an engineer who works on both client-side and server-side of the software application.

Self Assessment

1. Choose a true statement from the followings about GIT?
 - A. Git is open-source
 - B. Git is an example of distributed version control system
 - C. Used for handling the development of small and large projects
 - D. All of the above
2. A repository is a file structure where git stores all the project-based files.
 - A. TRUE
 - B. FALSE
 - C. Can be true or false
 - D. Cannot say
3. How to initialize the local repository with git?
 - A. \$ git start
 - B. \$ git pull
 - C. \$ git clean
 - D. \$ git init
4. How to check the status of your local repository since your last commit?
 - A. \$ git check
 - B. \$ git commit
 - C. \$ git diff
 - D. \$ git status

5. Which command do you use to check the history of your repository?
 - A. \$ git checkout
 - B. \$ git fetch
 - C. \$ git log
 - D. \$ git diff

6. Git can be used for which project?
 - A. Java enterprise project
 - B. .Net project
 - C. File version management
 - D. All of the above

7. Which of the following git command downloads your repository from GitHub to your computer?
 - A. git fork
 - B. git commit
 - C. git clone
 - D. git push

8. What is the full form of GIT?
 - A. Gastro Intestinal Track.
 - B. Gastro International Track.
 - C. Global Information Tracker
 - D. None of these

9. Which of the following advantage of using GIT?
 - A. Collaboration friendly
 - B. Data redundancy and replication
 - C. Data redundancy and replication
 - D. All of the above

10. What is the function of 'GIT PUSH' in GIT?
 - A. 'GIT PUSH' updates remote refs.
 - B. 'GIT PUSH' updates remote refs along with associated objects.
 - C. 'GIT PUSH' remote refs along with associated objects.
 - D. None of these

11. What is full form of VCS?
 - A. Version Configuration Solutions
 - B. Version Configuration System
 - C. Version Control System
 - D. Version Consolidated Solutions

12. Git works on
 - A. Windows
 - B. Mac
 - C. Linux
 - D. All of above

13. Which of the following is git tool?
 - A. GitK
 - B. Git Bash
 - C. Git GUI
 - D. All of the above

14. Who created Git?
 - A. Dennis Ritchie
 - B. Linus Babbage
 - C. Linus Torvalds
 - D. James Gosling

15. GIT comes from
 - A. 2005
 - B. 2007
 - C. 2004
 - D. 2008

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. D | 2. A | 3. D | 4. D | 5. C |
| 6. D | 7. C | 8. C | 9. D | 10. B |
| 11. C | 12. D | 13. D | 14. C | 15. A |

Review Questions

1. What is Git? How Git is different from GitHub.
2. Why do we need Git? Explain with a suitable example.
3. What are the uses of git clone and git push commands? Explain with a suitable example.
4. Explain the steps that are used to log in on GitHub.
5. What is full stack development?



Further Readings

- Scott Chacon and Ben Straud, Pro Git Second edition, Apress

**Web Links**

- <https://git-scm.com/>
- <https://en.wikipedia.org/wiki/Git>
- <https://www.w3schools.com/git/default.asp>

Unit 03: NodeJS and NPM

CONTENTS

Objectives

Introduction

3.1 Nodejs and NPM

3.2 Bootstrap

3.3 Applications of Bootstrap

3.4 Where to Get Bootstrap?

3.5 Bootstrap CDN

3.6 Front End Frameworks

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand NPM
- Install NPM
- Analyze nodejs
- Understand different front-end frameworks

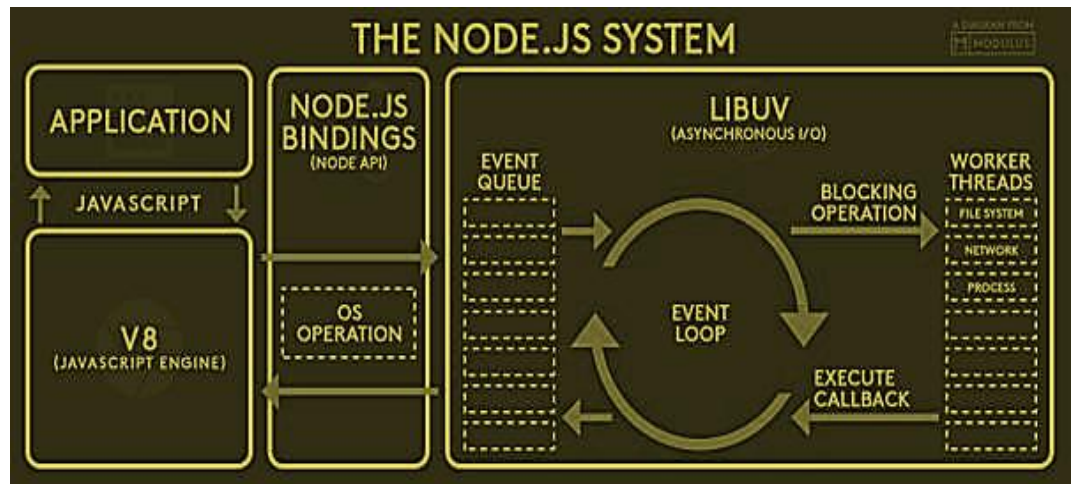
Introduction

Node.js is a server-side platform built on Google Chrome's JavaScript Engine (V8 Engine). Node.js was developed by Ryan Dahl in 2009. An open source, cross-platform runtime environment called Node.js is used to create networking and server-side applications. Applications for Node.js can be created in JavaScript and run on Linux, OS X, and Microsoft Windows using the Node.js runtime. In simple words, we can say nodejs is a collection of runtime environments and javascript libraries.

Node.js = Runtime Environment + JavaScript Library

3.1 Nodejs and NPM

Node.js is a framework that contains the V8 JavaScript engine, the standard library of packages, and some binaries. In reality, it is more complex than that as explained in the below diagram .



Like Web APIs in the browser, Node.js has a standard library that contains JavaScript packages which may also provide an interface to low-level APIs. For example, Node.js comes with the `fs` package which contains the `readFile` function among many. This function reads the file on the disk of the machine and returns file content back. The Node.js architecture is very complex and made of different parts as seen in the earlier diagram. It also contains an event loop that facilitates the execution of these callback functions.

Node Package Manager (NPM) provides two main functionalities –

1. Online repositories for node.js packages/modules which are searchable on search.npmjs.org
2. Command line utility to install Node.js packages, do version management and dependency management of Node.js packages.



Did you Know?

npm is installed with Node.js

This means that you have to install Node.js to get npm installed on your computer.

Installation of nodejs

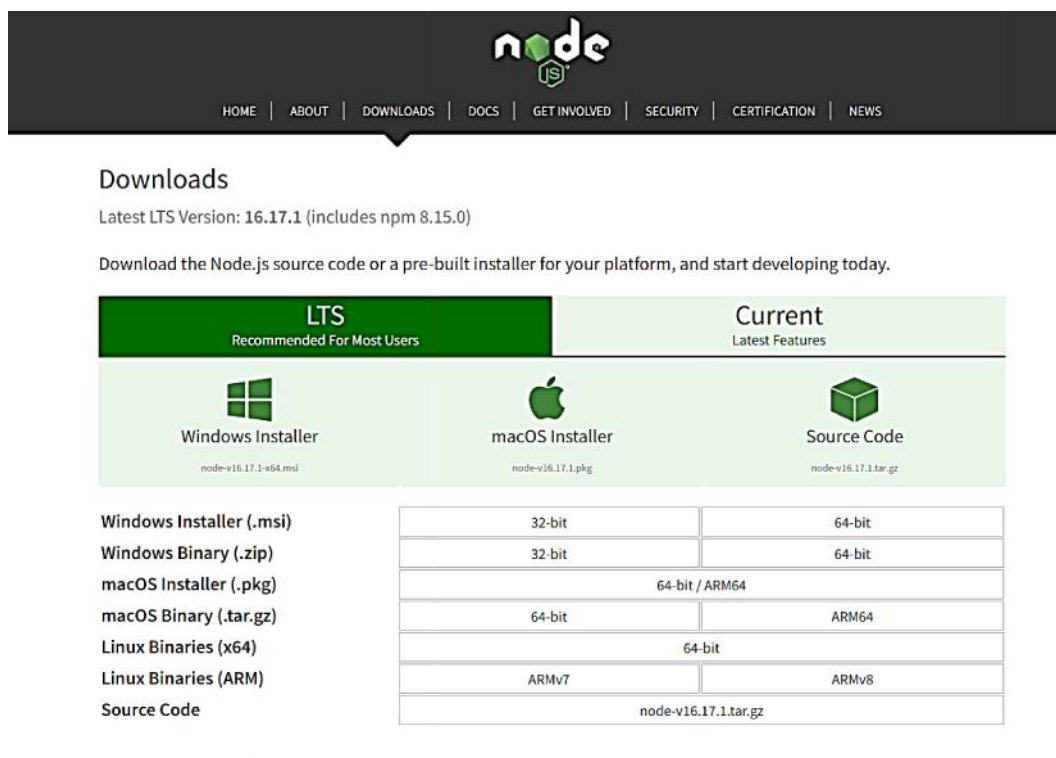
Here are the steps to downloading Node.js for Windows:



Notes: Node.js can be installed on Windows, macOS, and Linux. Node.js is asynchronous.

Download the latest version of a node from <https://nodejs.org/en/download/>

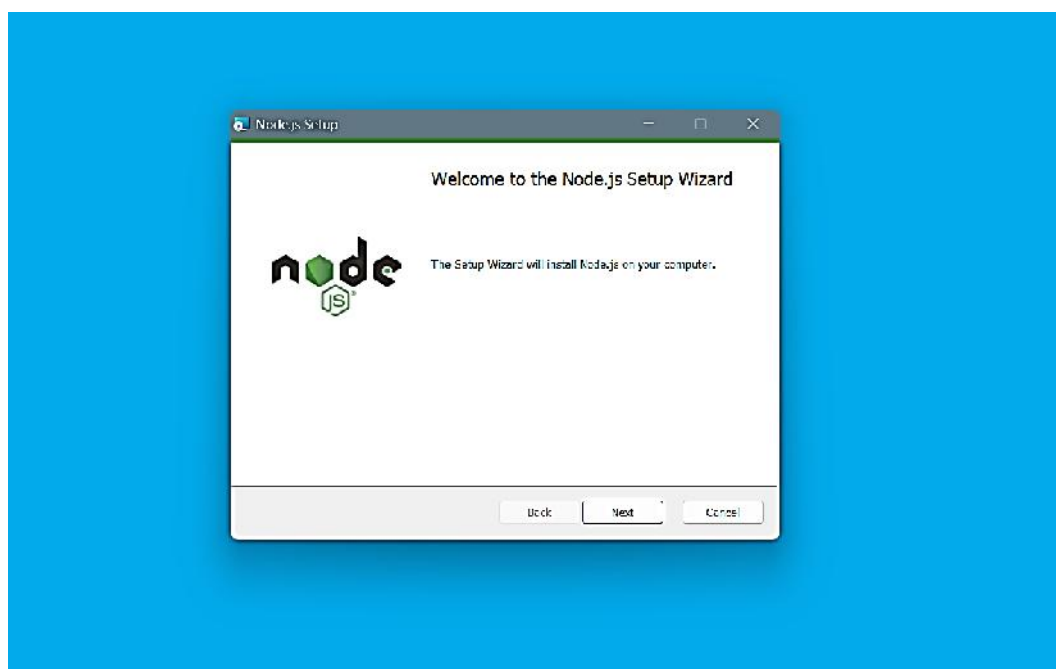
Step 1: Go to the Node.js website and find their downloads page.



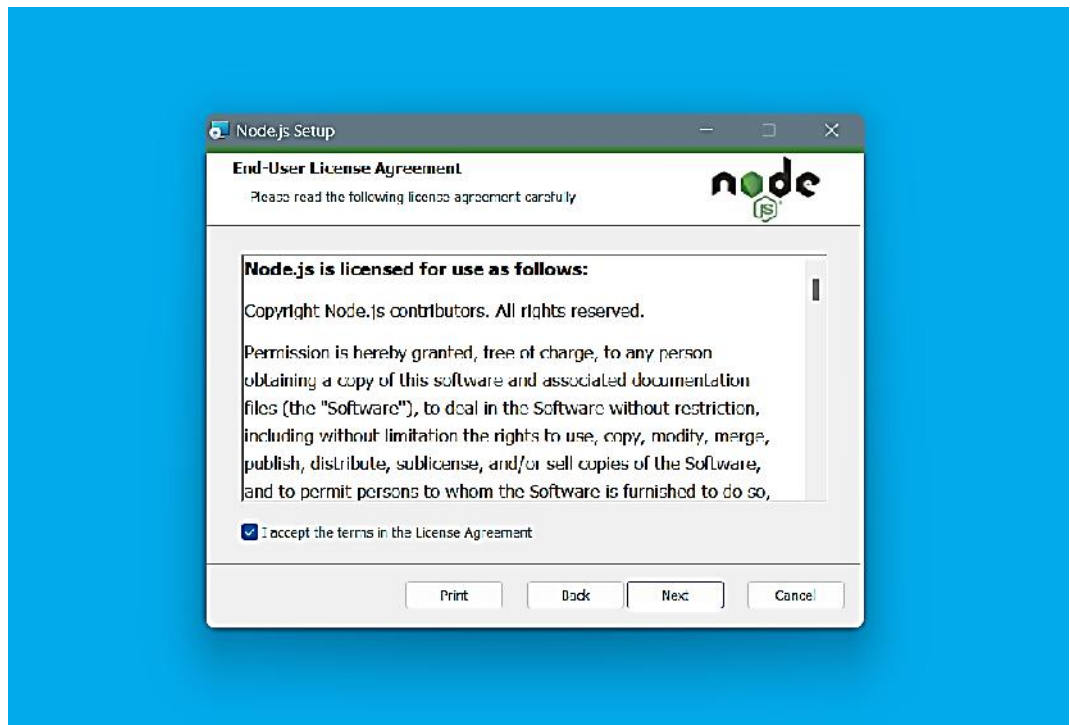
The image shows the Node.js Downloads page. At the top is the Node.js logo and a navigation bar with links: HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, CERTIFICATION, and NEWS. Below the navigation bar is the 'Downloads' section. It states 'Latest LTS Version: 16.17.1 (includes npm 8.15.0)' and 'Download the Node.js source code or a pre-built installer for your platform, and start developing today.' There are two main tabs: 'LTS Recommended For Most Users' and 'Current Latest Features'. Under the 'LTS' tab, there are three options: 'Windows Installer' (node-v16.17.1-x64.msi), 'macOS Installer' (node-v16.17.1.pkg), and 'Source Code' (node-v16.17.1.tar.gz). Below these options, there is a list of download links: 'Windows Installer (.msi)', 'Windows Binary (.zip)', 'macOS Installer (.pkg)', 'macOS Binary (.tar.gz)', 'Linux Binaries (x64)', 'Linux Binaries (ARM)', and 'Source Code'. To the right of this list is a table showing the available binaries for different architectures.

32-bit	64-bit
32-bit	64-bit
64-bit / ARM64	
64-bit	ARM64
64-bit	
ARMv7	ARMv8
node-v16.17.1.tar.gz	

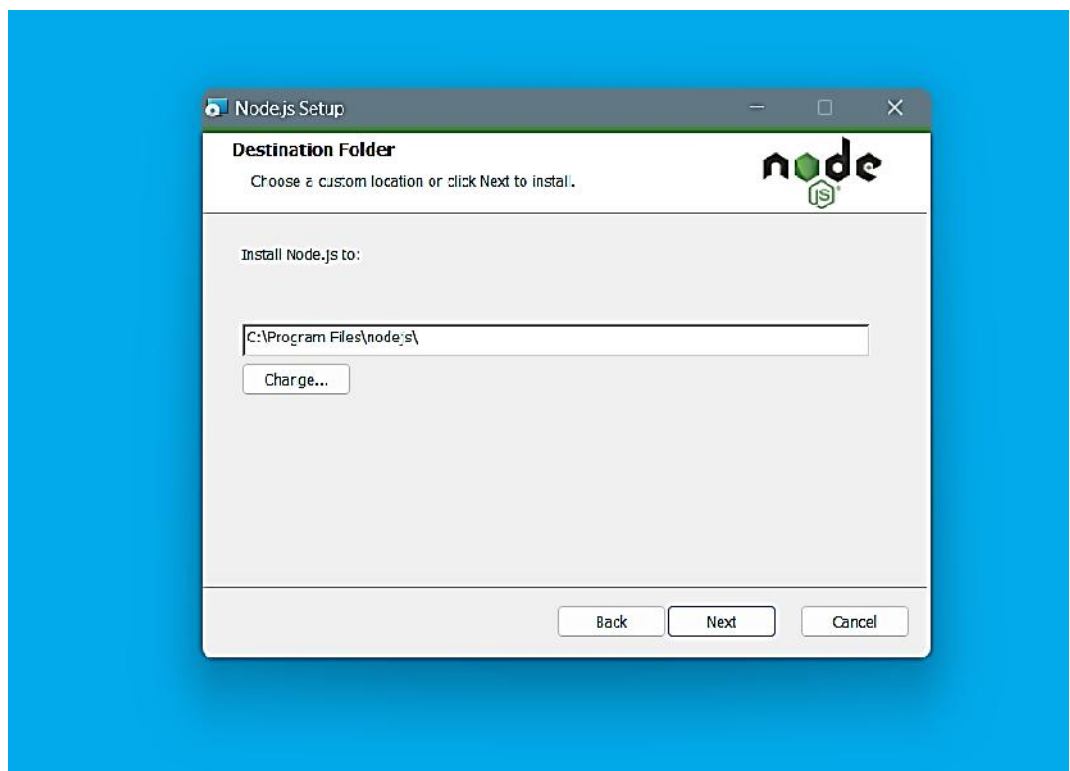
Step 2: Click on the windows installer to download and open the file.



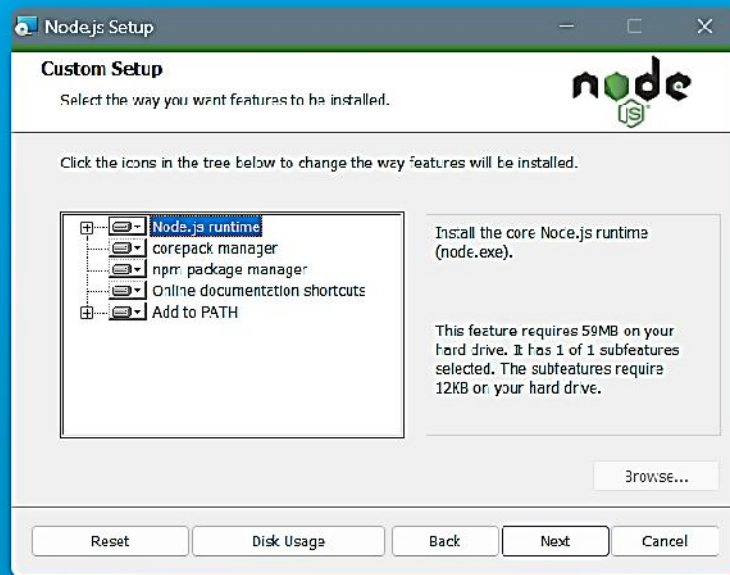
Step 3: Accept their license agreement by clicking 'Next.'



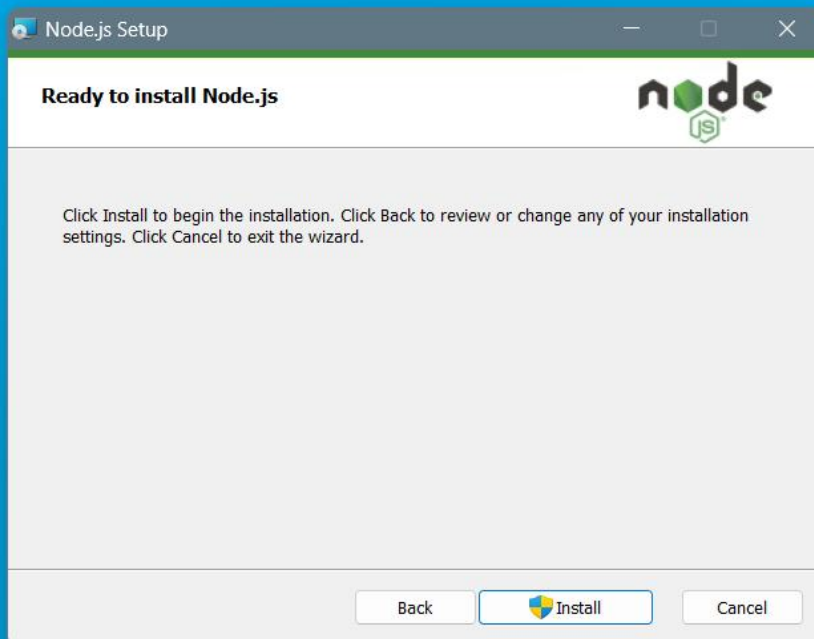
Step 4: Choose where you'd like to install Node.js, then click 'Next.'



Step 5: If you're a beginner, stick with the default Node.js setup by clicking 'Next.' You can change the setting as per your needs if you know what impact it'd have on the application.



Step 6: Click next again on the Tool for Native Modules page, then click 'Install.'



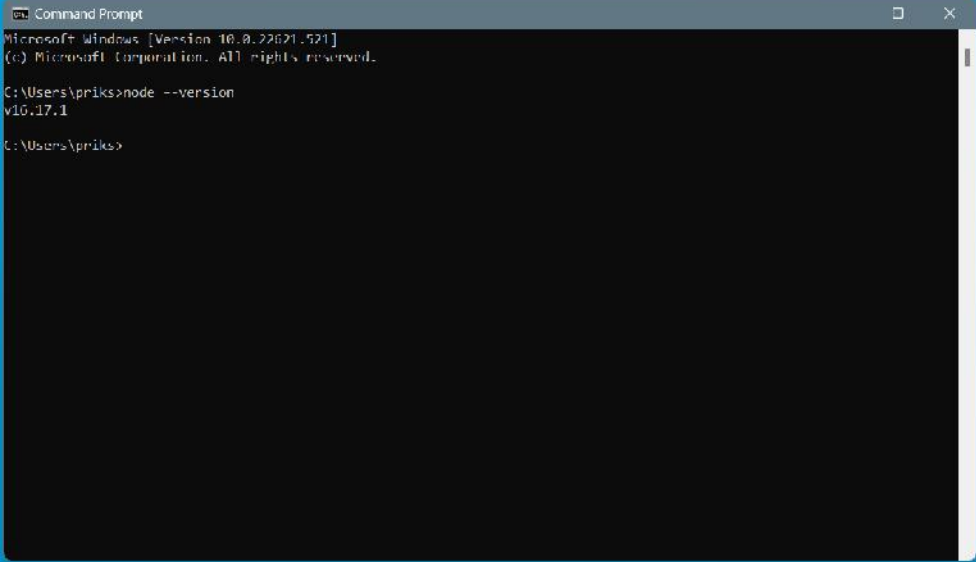
Click on install and wait for completion, node is successfully installed on your system.

**Notes:**

After successful installation of the node. Check the installation version by

Step 1: Open command prompt

Step 2: Type node --version



```
Command Prompt
Microsoft Windows [Version 10.0.22621.521]
(c) Microsoft Corporation. All rights reserved.

C:\Users\priks>node --version
v10.17.1

C:\Users\priks>
```

3.2 Bootstrap

The most popular HTML, CSS, and JavaScript framework for creating responsive and mobile-friendly websites is called Bootstrap. Utilization and download are both completely free. It is a front-end framework used to make web development simpler and quicker. It offers design templates for typography, forms, buttons, tables, navigation, modals, image carousels, and many other things that are based on HTML and CSS.

Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins.

**Did you Know?**

Bootstrap is a free front-end framework for faster and easier web development. It also gives you the ability to easily create responsive designs.

Why to Learn Bootstrap

Mobile first approach

Bootstrap 3, framework consists of Mobile first styles throughout the entire library instead of in separate files.

Browser Support

It is supported by all popular browsers.

Easy to Get Started

With just the knowledge of HTML and CSS, anyone can get started with Bootstrap. Also, the Bootstrap official site has good documentation.

Responsive design

Bootstrap's responsive CSS adjusts to Desktops, Tablets and Mobiles. More about the responsive design is in the chapter Bootstrap Responsive Design. Provides a clean and uniform solution for building an interface for developers. It contains beautiful and functional built-in components which are easy to customize. It also provides web-based customization. And best of all it is open-source.

3.3 Applications of Bootstrap

- **Scaffolding:** Bootstrap provides a basic structure with Grid System, link styles, and background.
- **CSS:** Bootstrap comes with the feature of global CSS settings, fundamental HTML elements styled and enhanced with extensible classes, and an advanced grid system.
- **Components:** Bootstrap contains over a dozen reusable components built to provide iconography, dropdowns, navigation, alerts, pop-overs, and much more.

Setting up bootstrap

3.4 Where to Get Bootstrap?

The bootstrap is an open-source software and it can be downloaded from getbootstrap.com

If you want to download and host Bootstrap yourself, go to getbootstrap.com, and follow the instructions there.

OR:

Include Bootstrap from a CDN

- If you don't want to download and host Bootstrap yourself, you can include it from a CDN (Content Delivery Network).
- MaxCDN provides CDN support for Bootstrap's CSS and JavaScript. You must also include jQuery.

3.5 Bootstrap CDN

You must include the following Bootstrap's CSS, JavaScript, and jQuery from MaxCDN into your web page.

```
<!-- Latest compiled and minified Bootstrap CSS -->
```

```
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css">
```

```
<!-- Latest compiled Bootstrap JavaScript -->
```

```
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.min.js" ></script>
```

```
<!-- latest jQuery library -->
```

```
<script src="https://code.jquery.com/jquery-3.2.1.slim.min.js" ></script>
```

Advantages of Using Bootstrap CDN

- Many users already have downloaded Bootstrap from MaxCDN when visiting another site.
- As a result, it will be loaded from cache when they visit your site, which leads to faster loading time.
- Also, most CDN's will make sure that once a user requests a file from it, it will be served from the server closest to them, which also leads to faster loading time.



Example:

```
<!doctype html>
<html lang="en">
<head>
<!-- Required meta tags -->
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
<!-- Bootstrap CSS -->
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css" >
<title>Hello, world!</title>
</head>
<body>
<h1 class="jumbotron">Hello, world!</h1>
<!-- JQuery and java Scripts-->
<script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.min.js" ></script>
</body>
</html>
```

Output



Hello, world!

3.6 Front End Frameworks

In recent years, frontend frameworks appear to have swept the web development industry. Anyone working as a Web developer, designer, programmer, or architect will be fully aware of how quickly this industry evolves, especially those who are new to the field and even more so those who just do Web design as a hobby rather than as a full-time job. One of the most important and vital responsibilities someone in this field must perform is keeping up with the unrelenting pace at which new technologies are produced and outdated technologies are upgraded. We feel lost in a sea of information if we don't do it for more than a few months, unable to consume at a rate any faster than the technological output.

What are Frontend Frameworks?

You possibly know them as Bootstrap or Foundation.

Frontend frameworks themselves are nothing new. In their most basic form, they're nothing more than a predefined set of CSS classes and Javascript functions for a developer to quickly and easily tap into. Some are even more basic, stripping out the Javascript and just being a list of CSS classes.

This technique of pre-defining pieces of markup for reuse over time has happened for many years, but more often than not in private, whether it be an agency who have built their own classes, libraries and functions to speed up production, or a one-man hobbyist who wanted to work smarter, rather than harder. The difference now, of course, is that frontend frameworks have gone public, gone mainstream, and become accessible to the masses.

Why Would We Use a Frontend Framework?

Speed and Simplicity

The primary goal of frontend frameworks has always been to speed up production for the developer, reduce costs, increase yield, and do so while keeping it simple, concise, and straightforward for even the most novice of Web developers.

Responsive, Cross-Device Support Built In

There is very little justification for not creating a responsive website in a world where the bulk of Internet traffic to Web sites in the Western world originates from a portable device, be it a tablet or smartphone. It can be challenging to grasp from scratch creating a responsive CSS that targets all necessary screen sizes and devices.

Pre-Tested Markup

You may be sure that any quality frontend framework's markup has undergone rigorous testing and approval procedures before being sent to you, the end user. The majority of the defects, both common and uncommon, have already been found, evaluated, and fixed, so you won't have many bugs fixing to complete for the duration of your project.

Detailed Documentation and Wide Support Network

Frameworks are incredibly helpful when you have the supporting documentation, as we previously described. Without the documentation to describe the framework's structure and the classes and functions you can use, the tool is useless. Fortunately, all top-notch frontend frameworks come with first-rate documentation, and the majority also have outstanding community support systems made up of knowledgeable end users and framework developers.

Summary

- Bootstrap is a free front-end framework for faster and easier web development. It also gives you the ability to easily create responsive designs.
- Content delivery network (CDN) is a system of distributed servers (network) that deliver webpages and other Web content to a user based on the geographic locations of the user, the origin of the webpage and a content delivery server.
- Bootstrap provides a grid system, which creates a page layout through a series of rows and columns that can place the content. There is no Grid system in CSS.
- Node.js also provides a rich library of various JavaScript modules which simplifies the development of web applications using Node.js to a great extent.

Keywords

Bootstrap: Bootstrap is a free front-end framework for faster and easier web development. It also gives you the ability to easily create responsive designs.

Web Framework: A web framework (WF) or web application framework (WAF) is a software framework that is designed to support the development of web applications including web services, web resources, and web APIs.

HTML: The HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser.

NPM: npm is two things: first and foremost, it is an online repository for the publishing of open-source Node.js projects; second, it is a command-line utility for interacting with said repository that aids in package installation, version management, and dependency management.

SelfAssessment

1. What is full form of CDN
 - A. Content Direct Network
 - B. Content Delivery Network
 - C. Content Delivery Node
 - D. Create Delivery Network

2. Which of the following class in bootstrap is used to create a big box for calling extra attention?
 - A. .box
 - B. .container
 - C. .container-fluid
 - D. .jumbotron

3. What are the advantages of Bootstrap
 - A. Easy to use
 - B. Responsive
 - C. Mobile first
 - D. All of the above

4. Which of the following statement is correct?
 - A. Nodejs is Server Side Language.
 - B. Nodejs is the Client Side Language.
 - C. Nodejs is both Server Side and Client Side Language.
 - D. None of the above.

5. Which of the following command is used to check the version of the installed node?
 - A. Node
 - B. Node -v
 - C. Node -version
 - D. None of above

6. Which of the following extension is used to save the Node.js files?
 - A. .js
 - B. .node
 - C. .java
 - D. .txt

7. Node.js is _____ by default.
 - A. Synchronous
 - B. Multi-threaded
 - C. Asynchronous
 - D. None of the above

8. What npm stands for?
 - A. Node Package Manager

- B. Node Project Manager
- C. New Project Manager
- D. New Package Manager

9. HTML stands for _____

- A. HyperText Markup Language
- B. HyperText Machine Language
- C. HyperText Marking Language
- D. HighText Marking Language

10. What is the correct syntax of doctype in HTML5?

- A. </doctype html>
- B. <doctype html>
- C. <doctype html!>
- D. <!doctype html>

11. Which of the following is correct about Bootstrap?

- A. Bootstrap's responsive CSS adjusts to Desktops, Tablets, and Mobiles.
- B. Provides a clean and uniform solution for building an interface for developers.
- C. It contains beautiful and functional built-in components which are easy to customize.
- D. All of the above.

12. Which of the following is correct about Bootstrap?

- A. Bootstrap is a sleek, intuitive, and powerful, mobile-first front-end framework for faster and easier web development.
- B. It uses HTML, CSS, and Javascript.
- C. Bootstrap was developed by Mark Otto and Jacob Thornton at Twitter.
- D. All of the above.

13. What is the full form of NPM?

- A. Node Program Manager
- B. Node Performance Manager
- C. Node Package Manager
- D. None of above

14. What is the default scope in Node.js Application?

- A. Global
- B. Local
- C. Global Function
- D. Local to object

15. Node.js runs on _____

- A. Client
- B. Server
- C. Both, server and client
- D. None of the above

Answers for SelfAssessment

1. B 2. D 3. D 4. A 5. C

- | | | | | |
|-------|-------|-------|-------|-------|
| 6. A | 7. C | 8. A | 9. A | 10. D |
| 11. D | 12. D | 13. C | 14. B | 15. B |

Review Questions

1. What do you mean by front end framework? Explain.
2. Write down the steps to install node js on windows operating system.
3. Write advantages of bootstrap.
4. What do you mean by CDN?
5. How bootstrap connected with HTML. Explain the process with suitable example.



Further Readings

Beginning Node.js, Book by Basarat Ali Syed

Learning Bootstrap 4, Book by Matt Lambert

Bootstrap in 24 Hours, Book by Jennifer Kyrnin



Web Links

<https://nodejs.org/en/download/>

<https://getbootstrap.com/>

Unit 04: Responsive Design

CONTENTS

Objectives

Introduction

4.1 Responsive Design

4.2 Grid System

4.3 Using Flex

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

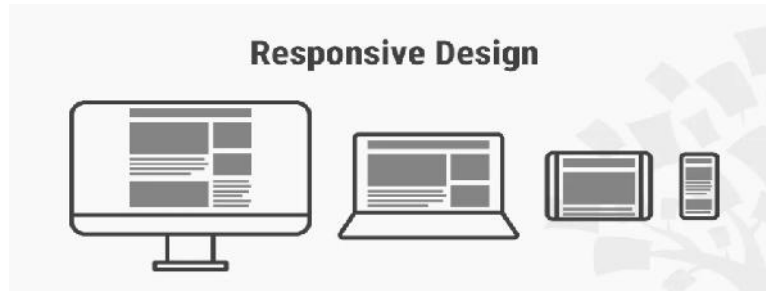
- Understand Responsive Design
- Understand Grid System
- Analyze distinct flex grid in bootstrap

Introduction

A graphic user interface (GUI) design strategy called responsive design is used to produce content that fluidly adapts to different screen sizes. To ensure content consistency across devices, designers apply media queries and size elements in relative units (%) so that their designs can automatically adjust to the browser space. Responsive design allows your site to resize to fit any screen. Rather than designing around a specific layout, or designing a separate mobile and desktop site, your site should scale to fit any device. In the real world, people will use your site in all kinds of different ways; there are small phones, big phones, tablets, tablets in landscape mode, netbooks, laptops, and 5K iMacs.

4.1 Responsive Design

Through code, responsive web design automatically adapts the layout to various screen sizes and resolutions. It is what enables consumers to view a web page smoothly whether they are using a large desktop display or a small mobile device. On a mobile device, for instance, a huge website header with a few columns will be divided into smaller blocks and stacked vertically to make it simpler for the user to read the content and view the visuals.



Notes: To create a responsive website, add the following <meta> tag to all your web pages:

<meta name="viewport" content="width=device-width, initial-scale=1.0">



Example: <!DOCTYPE html>

```
<html>
```

```
<head>
```

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```
</head>
```

```
<body>
```

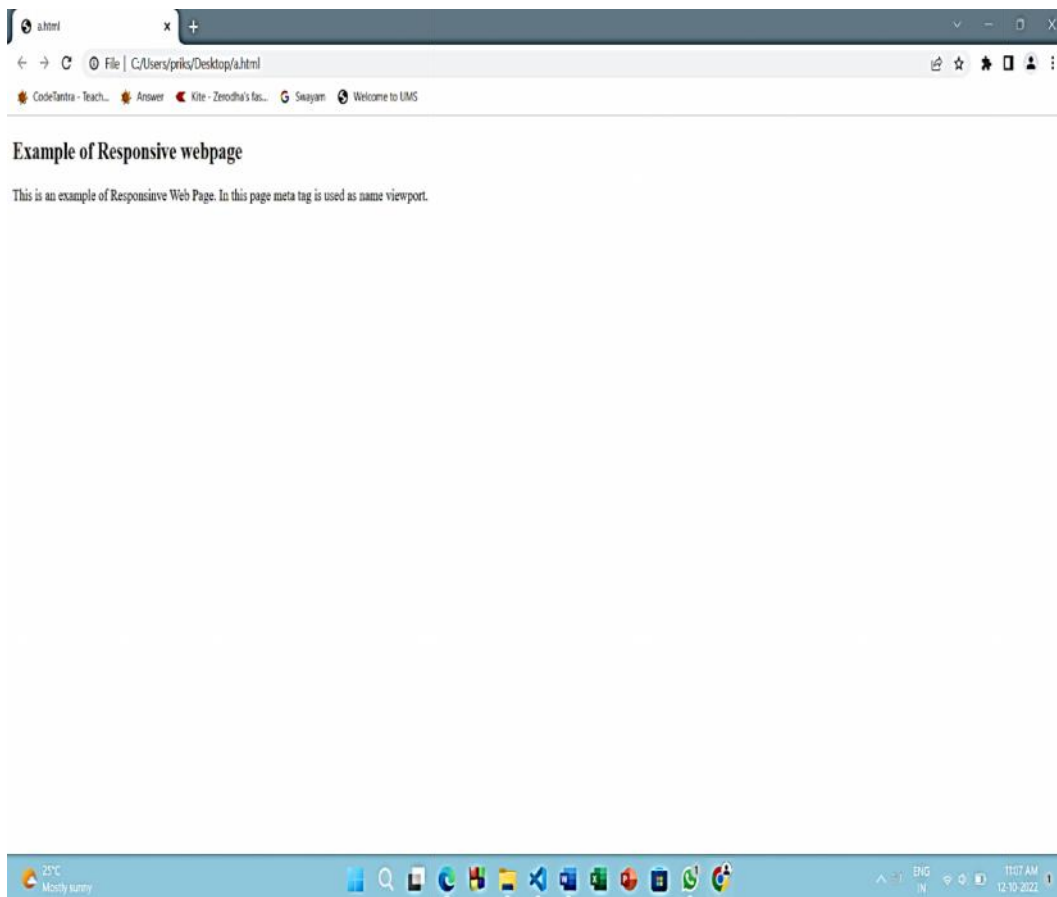
```
<h2>Example of Responsive webpage</h2>
```

```
<p> This is an example of Responsinve Web Page. In this page meta tag is used as name  
viewport.</p>
```

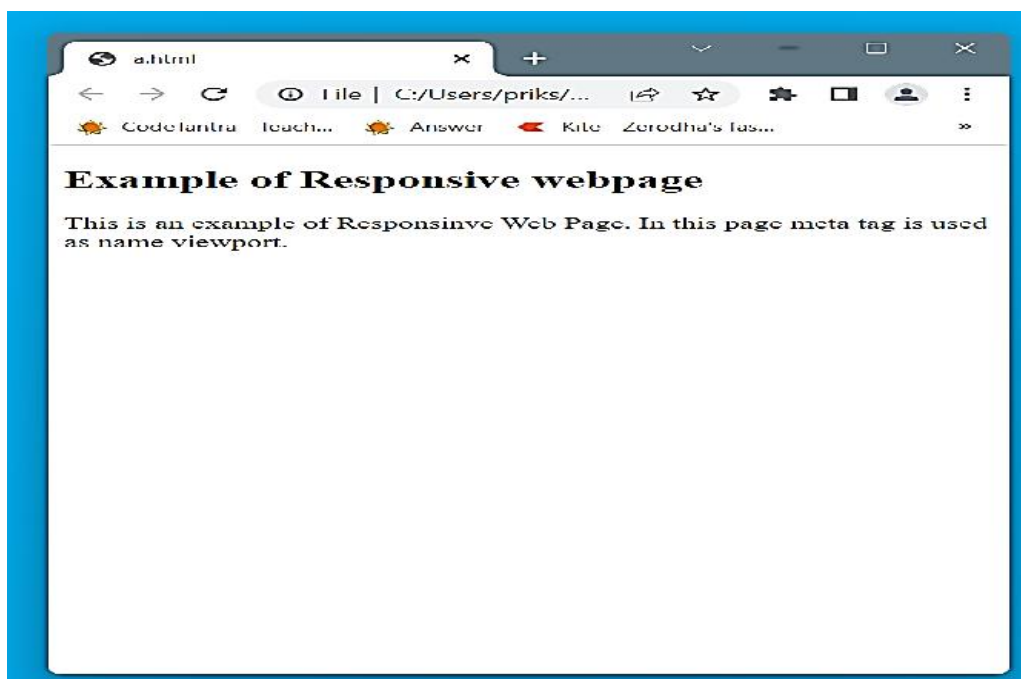
```
</body>
```

```
</html>
```

Output 1 – Full Browser



Output 2 – Output resized according to browser width



4.2 Grid System

The grid system in Bootstrap 4 is created with CSS Flexbox and divided into a maximum of twelve column-like segments on a webpage. But there are also situations where a webpage does not require a 12-column structure, then column grouping, that is, a grid structure, can be created in many other ways.

Here's an example that shows the different multi-column grid systems that can be created in Bootstrap 4:

col-8								col-4			
col-4				col-4				col-4			
col-9								col-3			
col-12											
col	col	col	col	col	col	col	col	col	col	col	col



Notes: Bootstrap 4 grid is a 2D structure of intersecting lines, which can be both vertical and horizontal, and is used to structure the content.

Bootstrap 4 classes of Grid

Class Name	Description
col-	It is for other small devices where the screen size is less than 576px.
col-sm-	It is for small devices with a screen size equal to or greater than 576px.
col-md-	It is for medium devices with a screen width equal to or greater than 768px.
col-lg-	It is for large devices with a screen width equal to or greater than 992px.
col-xl-	It is for extra-large devices with a screen width equal to or greater than 1200px.



Example:

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Example</title>
```



```
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css">
<script src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>
```

```
<div class="container-fluid">
<h1>Bootstrap Grid System</h1>
```

<p>The first, second and third row will automatically stack on top of each other when the screen is less than 576px wide.</p>

```
<div class="container-fluid">
```

```
<div class="row">
<div class="col-sm-6" style="background-color:yellow;">50%</div>
<div class="col-sm-6" style="background-color:orange;">50%</div>
</div>
<br>
```

```
<div class="row">
<div class="col-sm-4" style="background-color:yellow;">33.33%</div>
<div class="col-sm-4" style="background-color:orange;">33.33%</div>
<div class="col-sm-4" style="background-color:yellow;">33.33%</div>
</div>
<br>
```

```
<!-- Or let Bootstrap automatically handle the layout -->
```

```
<div class="row">
<div class="col-sm" style="background-color:yellow;">25%</div>
<div class="col-sm" style="background-color:orange;">25%</div>
<div class="col-sm" style="background-color:yellow;">25%</div>
<div class="col-sm" style="background-color:orange;">25%</div>
</div>
<br>
<div class="row">
```



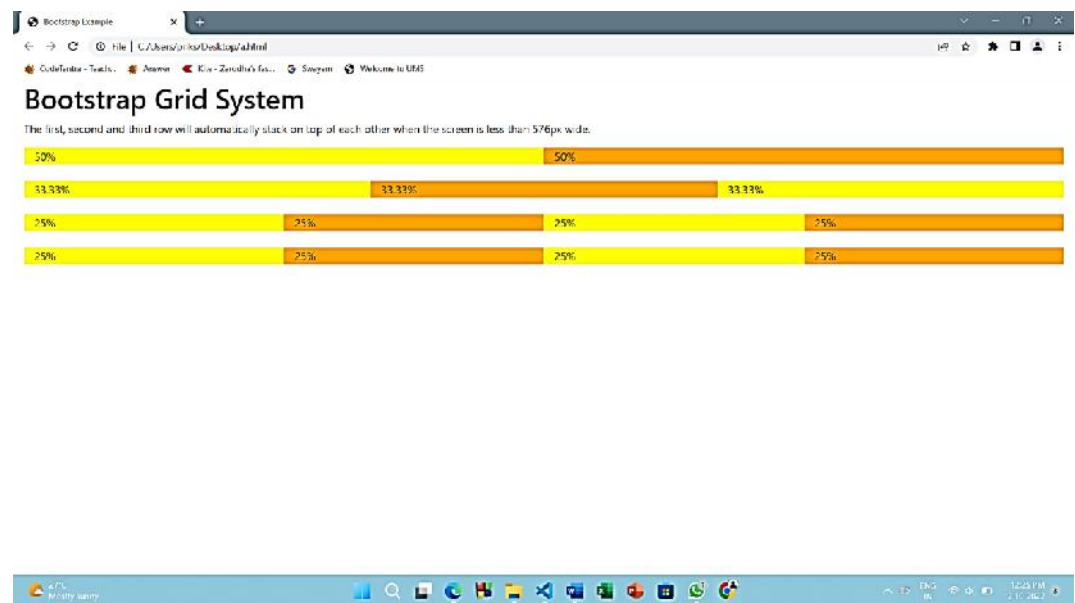
```

<div class="col" style="background-color:yellow;">25%</div>
<div class="col" style="background-color:orange;">25%</div>
<div class="col" style="background-color:yellow;">25%</div>
<div class="col" style="background-color:orange;">25%</div>
</div>
</div>
</div>

</body>
</html>

```

Output –



4.3 Using Flex

With a complete set of responsive flexbox tools, you can easily control the layout, alignment, and scaling of grid columns, navigation, components, and more. Custom CSS can be required for implementations that are more complicated.

Apply display utilities to create a flexbox container and transform direct children elements into flex items. Flex containers and items are able to be modified further with additional flex properties.



Example:

```
<div class="d-flex p-2">I'm a flexbox container! </div>
```



Responsive variations also exist for `.d-flex` and `.d-inline-flex`.

- `.d-flex`
- `.d-inline-flex`
- `.d-sm-flex`
- `.d-sm-inline-flex`
- `.d-md-flex`
- `.d-md-inline-flex`
- `.d-lg-flex`
- `.d-lg-inline-flex`
- `.d-xl-flex`
- `.d-xl-inline-flex`

Direction

Set the direction of flex items in a flex container with direction utilities. In most cases you can omit the horizontal class here as the browser default is row. However, you may encounter situations where you needed to explicitly set this value (like responsive layouts).

Use `.flex-row` to set a horizontal direction (the browser default), or `.flex-row-reverse` to start the horizontal direction from the opposite side.



Example



```
<div class="d-flex flex-row">  
<div class="p-2">Flex item 1</div>  
<div class="p-2">Flex item 2</div>  
<div class="p-2">Flex item 3</div>  
</div>  
<div class="d-flex flex-row-reverse">  
<div class="p-2">Flex item 1</div>  
<div class="p-2">Flex item 2</div>  
<div class="p-2">Flex item 3</div>  
</div>
```

Responsive variations also exist for `flex-direction`.

- `.flex-row`
- `.flex-row-reverse`
- `.flex-column`

- .flex-column-reverse
- .flex-sm-row
- .flex-sm-row-reverse
- .flex-sm-column
- .flex-sm-column-reverse
- .flex-md-row
- .flex-md-row-reverse
- .flex-md-column
- .flex-md-column-reverse
- .flex-lg-row
- .flex-lg-row-reverse
- .flex-lg-column
- .flex-lg-column-reverse
- .flex-xl-row
- .flex-xl-row-reverse
- .flex-xl-column
- .flex-xl-column-reverse

Justify content

Use justify-content utilities on flexbox containers to change the alignment of flex items on the main axis (the x-axis to start, y-axis if flex-direction: column). Choose from start (browser default), end, center, between, or around.



Example:

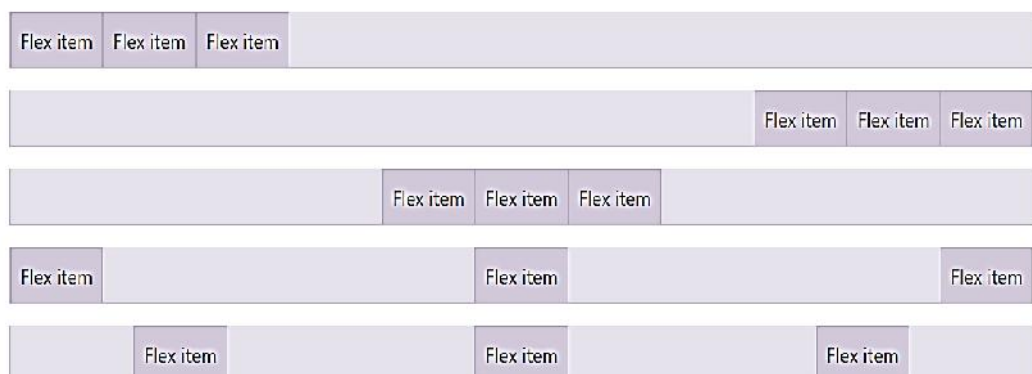
```
<div class="d-flex justify-content-start">...</div>
```

```
<div class="d-flex justify-content-end">...</div>
```

```
<div class="d-flex justify-content-center">...</div>
```

```
<div class="d-flex justify-content-between">...</div>
```

```
<div class="d-flex justify-content-around">...</div>
```



Responsive variations also exist for justify content.

- .justify-content-start
- .justify-content-end

- .justify-content-center
- .justify-content-between
- .justify-content-around
- .justify-content-sm-start
- .justify-content-sm-end
- .justify-content-sm-center
- .justify-content-sm-between
- .justify-content-sm-around
- .justify-content-md-start
- .justify-content-md-end
- .justify-content-md-center
- .justify-content-md-between
- .justify-content-md-around
- .justify-content-lg-start
- .justify-content-lg-end
- .justify-content-lg-center
- .justify-content-lg-between
- .justify-content-lg-around
- .justify-content-xl-start
- .justify-content-xl-end
- .justify-content-xl-center
- .justify-content-xl-between
- .justify-content-xl-around

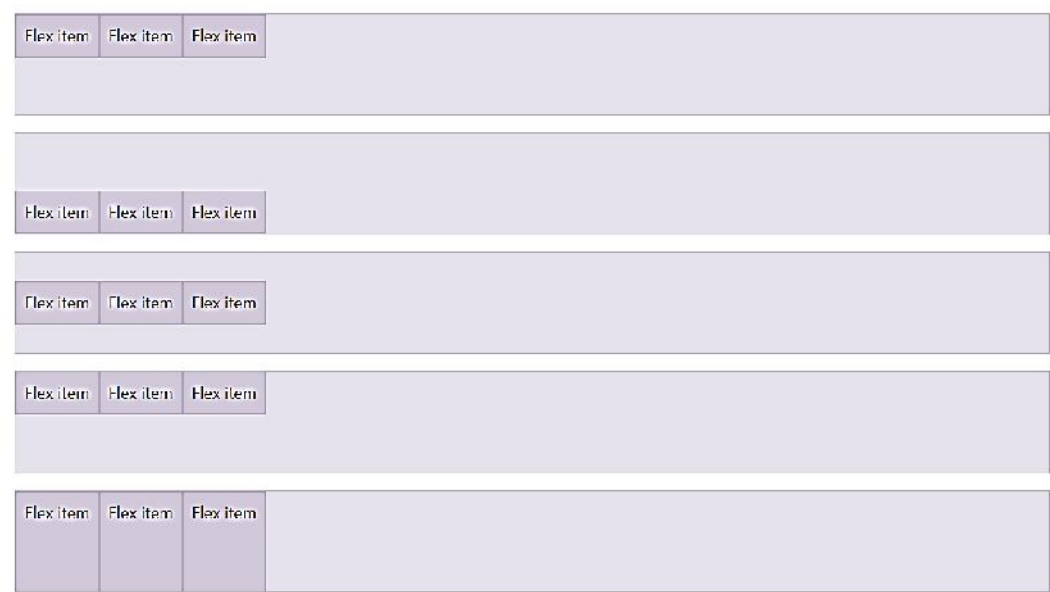
Align items

Use align-items utilities on flexbox containers to change the alignment of flex items on the cross axis (the y-axis to start, x-axis if flex-direction: column). Choose from start, end, center, baseline, or stretch (browser default).



Example:

```
<div class="d-flex align-items-start">...</div>
<div class="d-flex align-items-end">...</div>
<div class="d-flex align-items-center">...</div>
<div class="d-flex align-items-baseline">...</div>
<div class="d-flex align-items-stretch">...</div>
```

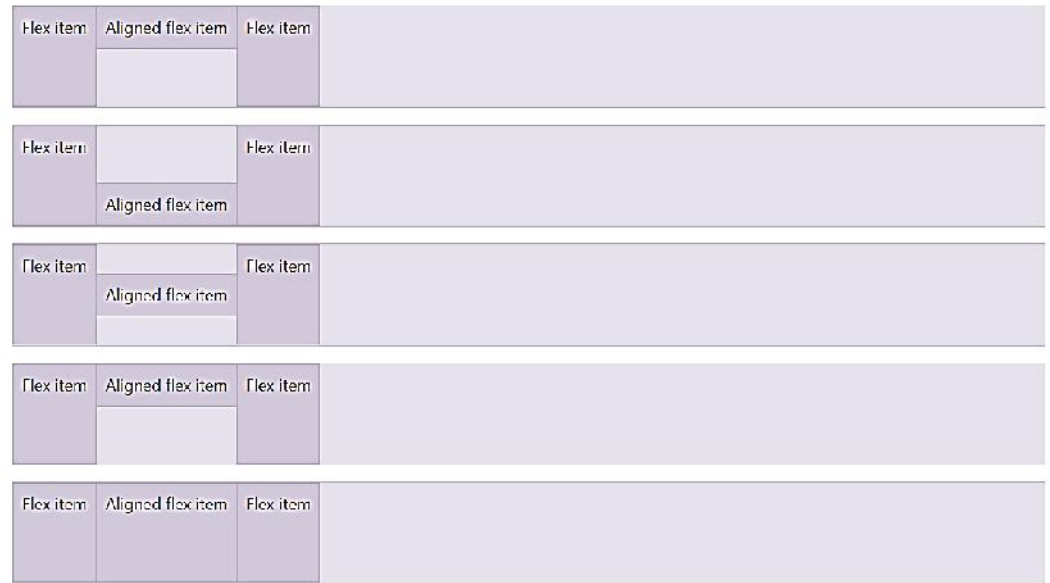



Align self

Use align-self utilities on flexbox items to individually change their alignment on the cross axis (the y-axis to start, x-axis if flex-direction: column). Choose from the same options as align-items: start, end, center, baseline, or stretch (browser default).



Example



```
<div class="align-self-start">Aligned flex item</div>
<div class="align-self-end">Aligned flex item</div>
<div class="align-self-center">Aligned flex item</div>
<div class="align-self-baseline">Aligned flex item</div>
<div class="align-self-stretch">Aligned flex item</div>
```

Responsive variations also exist for align-self.

- .align-self-start
- .align-self-end
- .align-self-center
- .align-self-baseline
- .align-self-stretch
- .align-self-sm-start
- .align-self-sm-end
- .align-self-sm-center
- .align-self-sm-baseline
- .align-self-sm-stretch
- .align-self-md-start
- .align-self-md-end
- .align-self-md-center
- .align-self-md-baseline
- .align-self-md-stretch
- .align-self-lg-start
- .align-self-lg-end
- .align-self-lg-center

Summary

- Bootstrap is the most popular HTML, CSS, and JavaScript framework for developing a responsive and mobile-friendly website.
- It is absolutely free to download and use.
- It is a front-end framework used for easier and faster web development.
- It facilitates you to create responsive designs.

Keywords

Responsive Website: A website is called a responsive website which can automatically adjust itself to look good on all devices, from smartphones to desktops etc.

Scaffolding: Bootstrap provides a basic structure with Grid System, link styles, and background.

CSS: Bootstrap comes with the feature of global CSS settings, fundamental HTML elements style and an advanced grid system.

Components: Bootstrap contains a lot of reusable components built to provide iconography, dropdowns, navigation, alerts, pop-overs, and much more.

JavaScript Plugins: Bootstrap also contains a lot of custom jQuery plugins. You can easily include them all, or one by one.

SelfAssessment

1. Which of the following class in Bootstrap is used to provide a responsive fixed width container?
 - A. .container-fixed
 - B. .container-fluid
 - C. .container

- D. All of the above
2. Bootstrap includes a responsive, mobile-first fluid grid system that appropriately scales up to _____ as the device or viewport size increases.
- A. 9 columns
 - B. 10 columns
 - C. 11 columns
 - D. 12 columns
3. Which of the following is correct about the Bootstrap Grid System?
- A. Rows must be placed within a `.container` class for proper alignment and padding.
 - B. Use rows to create horizontal groups of columns.
 - C. Content should be placed within the columns, and only columns may be the immediate children of rows.
 - D. All of the above.
4. Which of the following is correct about the Bootstrap Grid System?
- A. Predefined grid classes like `.row` and `.col-xs-4` are available for quickly making grid layouts. Fewer mixins can also be used for more semantic layouts.
 - B. Columns create gutters (gaps between column content) via padding. That padding is offset in rows for the first and the last column via negative margin on `.rows`.
 - C. Grid columns are created by specifying the number of twelve available columns you wish to span. For example, three equal columns would use three `.col-xs-4`.
 - D. All of the above.
5. Responsive variations also exist for `align-self`.
- A. True
 - B. False
6. What are the features of bootstrap?
- A. Mobile first approach
 - B. Easy to get started
 - C. Browser Support
 - D. All of the above
7. Bootstrap package includes?
- A. Scaffolding
 - B. Components
 - C. JavaScript Plugins
 - D. All of the above

8. Which of these elements in HTML can be used for making a text bold?
- A. <a>
 - B. <pre>
 - C.

 - D.
9. Which tag is used in HTML5 for the initialization of the document type?
- A. <Doctype HTML>
 - B. <!DOCTYPE html>
 - C. <Doctype>
 - D. <\Doctype html>
10. Which of the following statements is/are correct about Bootstrap 4?
- A. It provides a free front - end framework
 - B. It is a completely open - source product
 - C. It gives the ability to create responsive designs
 - D. All of the above
11. What does the following meta tag do?
- `<META NAME="VIEWPORT" CONTENT="WIDTH=DEVICE-WIDTH, INITIAL-SCALE=1">`
- A. Tells the browser to look for media queries in the CSS file
 - B. Makes the web page responsive automatically
 - C. Prevents browsers from scaling desktop websites on mobile
 - D. None of the above options are correct
12. Which of the following is not included in the framework?
- A. Forms
 - B. Font Size
 - C. Button Style
 - D. Css
13. Bootstrap was first introduced in _____.
- A. Google
 - B. Facebook
 - C. Twitter
 - D. Snapchat
14. Which is not a tool to build responsive websites?
- A. skeleton
 - B. bookmarklets
 - C. code editors
 - D. web browsers

15. How many classes bootstrap 4 grid system has?

- A. 1
- B. 3
- C. 5
- D. 7

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 2. D | 3. D | 4. D | 5. A |
| 6. D | 7. D | 8. D | 9. B | 10. D |
| 11. C | 12. A | 13. C | 14. A | 15. C |

Review Questions

1. Create a responsive web page that include following HTML tags.
 - <P>
 - <Table>
2. What do you mean by flex system in bootstrap? Explain using example.
3. When we need responsive design?
4. Design a web page that demonstrate working of grid system
5. Develop a web page using Align self-flex grid.



Further Readings

Bootstrap by Example, Silvio Morato

Learning Bootstrap 4, Matt Lambert

Bootstrap in 24 Hours, By Sams

Jump Start Bootstrap,



Web Links

<https://getbootstrap.com/docs/4.1/layout/overview/>

<https://getbootstrap.com/docs/4.1/layout/grid/>

Unit 05: Navigation

CONTENTS

Objectives

Introduction

5.1 Navigability

5.2 Navigation Bar and Breadcrumbs

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand navigation bas
- Design navigation bar using bootstrap

Introduction

A navigation bar is a particularly important feature because it allows visitors to quickly and easily find important pages on your website, like your blog, product pages, pricing, contact info, and documentation. This improves the chances of visitors browsing your site longer, which can boost your page views and reduce your bounce rate.

One of the most noticeable elements of Bootstrap websites is the navbar. Navbars are responsive "meta" components that act as header navigation for your website or application. When viewed on a mobile device, navbars collapse and turn horizontal as the viewport width expands. The navbar's primary components are style for site names and fundamental navigation.

5.1 Navigability

When using the World Wide Web effectively, the process of checking out and managing resources and information is referred to as "navigability" (WWW) Generally speaking, navigating entails browsing a website or the internet to gather, curate, check out material, and improve usability. A web browser is the platform or user interface utilized for this navigation.

Navigation plays a very crucial role in instructing through and through and also getting the website users to see a much more holistic view of the webpage. The various functions of web navigation allow for a comfortable experience to the user. Navigation shapes the way we look at different things on the web page. It gives curated information about the brand, the value and reflects all the other features as well. Thus, navigation is all about traversing through the nuances and visiting various web pages using a web browser and gaining information that the user finds reliable.

Purpose of navigation.

Without an efficient navigation system, the visitor or the user is unable to find the point of contact and move further on the web page. The purpose of a friendly navigation system is solely to keep the user on your website and make him explore. This can be done by making the website enticing enough for the user to keep exploring with curiosity.

The function of navigation on a website:-

Usability and smooth functioning are the most important purposes of web navigation- usability in terms of user experience and access and smooth functioning all the way.

The use of website navigation tools allows for a glitch-free experience and provides efficiency.

Website navigation is more or less a map of key areas/functions of the website. It's similar to a map of a place where there are multiple places of interest.

5.2 Navigation Bar and Breadcrumbs

Navbar is Bootstrap's responsive navigation header. Here are a few key points you should know about this component:

- Navbars are responsive and fluid by default. Meaning, they expand or contract based on the width of the current viewport.
- Navbars require a wrapping. navbarwith. navbar-expand{-sm|-md|-lg|-xl} classes. These classes determine when content collapses behind a button.
- The <nav> element is a semantic HTML element. Using it ensures accessibility and is preferred over using a more generic element like a <div>.

How it works

Here's what you need to know before getting started with the navbar:

- Navbars require a wrapping. navbarwith. navbar-expand{-sm|-md|-lg|-xl} for responsive collapsing and color scheme classes.
- Navbars and their contents are fluid by default. Use optional containers to limit their horizontal width.
- Use our spacing and flex utility classes for controlling spacing and alignment within navbars.
- Navbars are responsive by default, but you can easily modify them to change that. Responsive behavior depends on our Collapse JavaScript plugin.
- Navbars are hidden by default when printing. Force them to be printed by adding .d-print to the .navbar. See the display utility class.
- Ensure accessibility by using a <nav> element or, if using a more generic element such as a <div>, add a role="navigation" to every navbar to explicitly identify it as a landmark region for users of assistive technologies.

**Example**

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Example</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css">
<script src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>
```



```

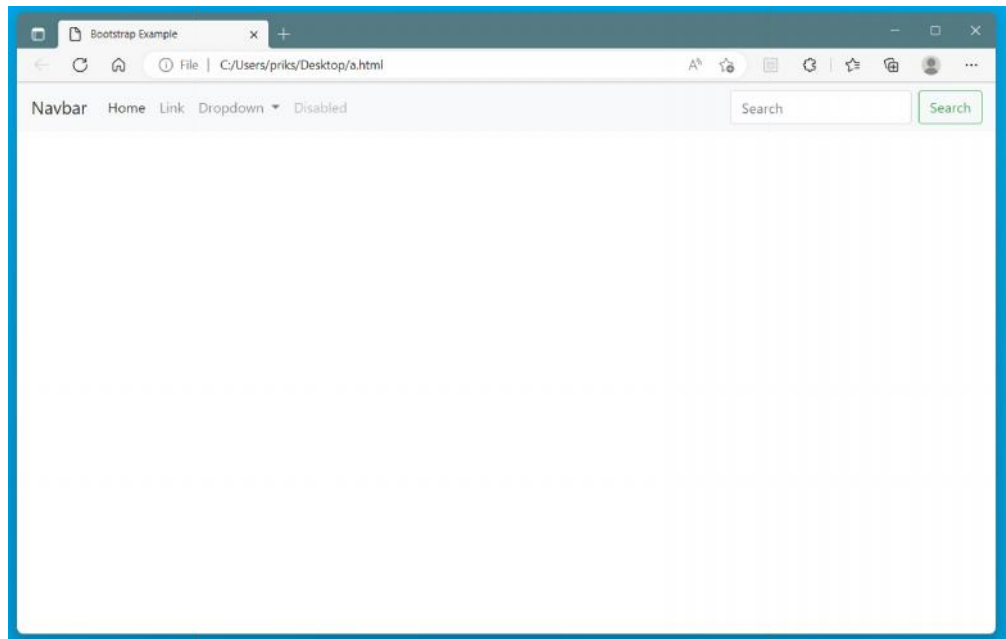
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>
<nav class="navbar navbar-expand-lg navbar-light bg-light">
<a class="navbar-brand" href="#">Navbar</a>
<button class="navbar-toggler" type="button" data-toggle="collapse" data-
target="#navbarSupportedContent" aria-controls="navbarSupportedContent" data-
expanded="false" aria-label="Toggle navigation">
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarSupportedContent">
<ul class="navbar-nav mr-auto">
<li class="nav-item active">
<a class="nav-link" href="#">Home <span class="sr-only">(current)</span></a>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item dropdown">
<a class="nav-link dropdown-toggle" href="#" role="button" data-toggle="dropdown" aria-
expanded="false">
    Dropdown
</a>
<div class="dropdown-menu">
<a class="dropdown-item" href="#">Action</a>
<a class="dropdown-item" href="#">Another action</a>
<div class="dropdown-divider"></div>
<a class="dropdown-item" href="#">Something else here</a>
</div>
</li>
<li class="nav-item">
<a class="nav-link disabled">Disabled</a>
</li>
</ul>
<form class="form-inline my-2 my-lg-0">
<input class="form-control mr-sm-2" type="search" placeholder="Search" aria-label="Search">
<button class="btn btn-outline-success my-2 my-sm-0" type="submit">Search</button>
</form>
</div>
</nav>
</body>

```



```
</html>
```

Output



It is used to show hierarchy-based information for a site and indicates current page's location within a navigational hierarchy. Bootstrap uses `breadcrumb` class to define the list into breadcrumb and adds a separator via CSS to the list.



Notes: Breadcrumb - Indicate the current page's location within a navigational hierarchy that automatically adds separators via CSS.



Example: Bootstrap breadcrumb examples -

Breadcrumb Default



Breadcrumb Primary



Breadcrumb Success



Breadcrumb Info

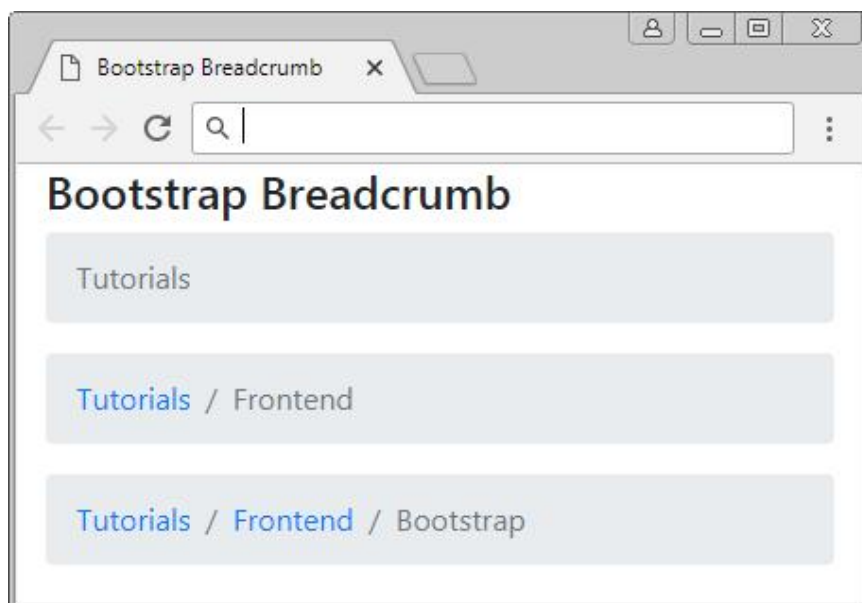


Breadcrumb Warning



Breadcrumb Danger





Lab Exercise:

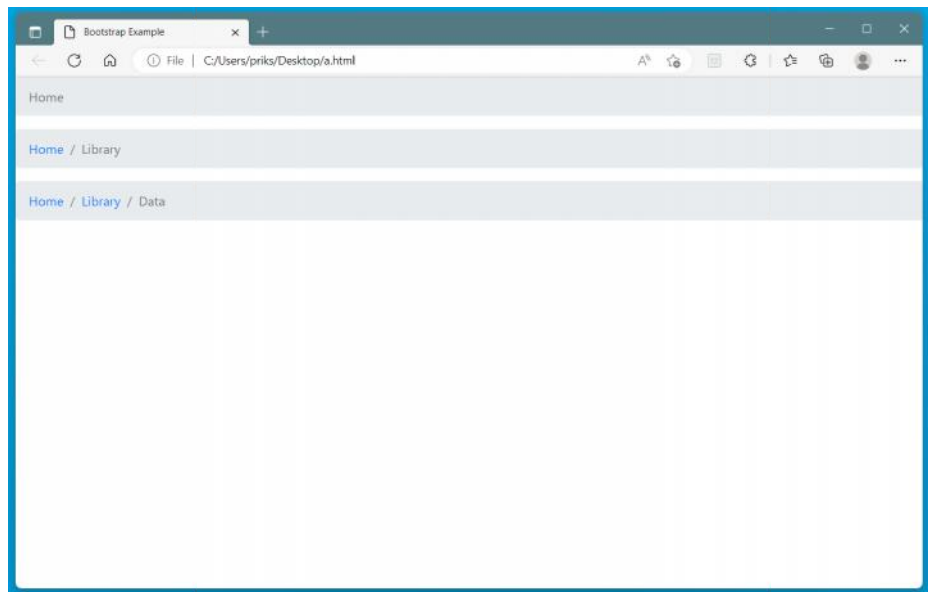
```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Example</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css" rel="stylesheet">
<script src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>
<nav aria-label="breadcrumb">
<ol class="breadcrumb">
<li class="breadcrumb-item active" aria-current="page">Home</li>
</ol>
</nav>
```



```
<nav aria-label="breadcrumb">
<ol class="breadcrumb">
<li class="breadcrumb-item"><a href="#">Home</a></li>
<li class="breadcrumb-item active" aria-current="page">Library</li>
</ol>
</nav>

<nav aria-label="breadcrumb">
<ol class="breadcrumb">
<li class="breadcrumb-item"><a href="#">Home</a></li>
<li class="breadcrumb-item"><a href="#">Library</a></li>
<li class="breadcrumb-item active" aria-current="page">Data</li>
</ol>
</nav>
</body>
</html>
```

Output



Summary

- Using Bootstrap 4, you can create a navigation bar.
- A navigation bar is used for containing the navigation interface of a website and is commonly displayed above or on the side of the content.
- Navbars require a wrapping. navbarwith .navbar-expand{-sm|-md|-lg|-xl|-xxl} for responsive collapsing and color scheme classes.
- Navbars and their contents are fluid by default. Change the container to limit their horizontal width in different ways.
- Use our spacing and flex utility classes for controlling spacing and alignment within navbars.

- Navbars are responsive by default, but you can easily modify them to change that. Responsive behavior depends on our Collapse JavaScript plugin.

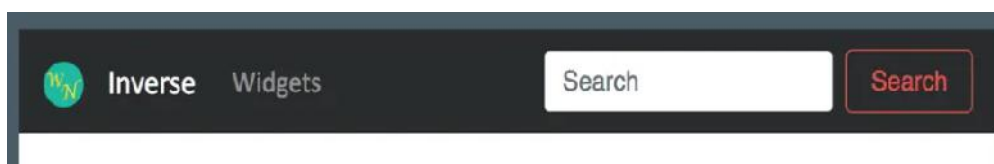
Keywords

Navbar: A navigation bar (or navigation system) is a section of a graphical user interface intended to aid visitors in accessing information. Navigation bars are implemented in file browsers, web browsers and as a design element of some web sites.

Breadcrumb Navigation: Breadcrumbs are a secondary navigation aid that helps users easily understand the relation between their location on a page (like a product page) and higher level pages (a category page, for instance).

SelfAssessment

- Which of the following bootstrap styles are used to add a dropdown to pills?
 - .nav, .nav-tab, .menu
 - .nav, .nav-pills, .dropdown-.menu
 - .nav, .nav-pills, .dropdown
 - .nav, .nav-pills
- Which of the following bootstrap style is to be used if you want the navbar fixed to the top of the page?
 - .navbar-top
 - .navbar-fixed
 - .navbar-fixed-top
 - None of the above
- Which of the following is a navbar?
 -



B.



C.



D. All of above

- Website navigation helps people to find the information they want to see very easily and effectively.
 - True
 - False

5. Good navigation makes the website look more attractive, effective, and good.
- A. True
 - B. False
6. How do we write comments in HTML?
- A. `</.....>`
 - B. `<!.....>`
 - C. `</...../>`
 - D. `<.....!>`
7. Choose the correct syntax for making a breadcrumb using bootstrap.
- A.

```
<nav aria-label="breadcrumb">
  <ol class="breadcrumb">
    <li class="breadcrumb-item active" aria-current="page">Home</li>
  </ol>
</nav>
```
 - B.

```
<ol class="breadcrumb">
  <li class="breadcrumb-item active" aria-current="page">Home</li>
</ol>
```
 - C.

```
<ol class="nav">
  <li>Home</li>
</ol>
```
 - D.

```
<div class="card">
  <div class="card-body">
    HOME
  </div>
</div>
```
8. Which of the following Bootstrap styles is used to create a vertical pills navigation?
- A. `.nav, .nav-tabs`
 - B. `.nav, .nav-pills, .nav-stacked`
 - C. `.nav, .nav-tabs, .nav-justified`
 - D. `.nav, .nav-pills`
9. A standard navigation bar is created using _____.
- A. `<nav class="navbar-black">`
 - B. `<nav class="navbar navbar-default">`
 - C. `<nav class="navbar navbar-inverse">`
 - D. `<nav class="nav navbar">`
10. Which of the following bootstrap style is to be used if you want the `.navbar` fixed to the top of the page?
- A. `.navbar-top`

- B. .navbar-fixed
 - C. .navbar-fixed-top
 - D. None of the above
11. Which of the following bootstrap style is to be used if you want to create a .navbar that scrolls with the page?
- A. .navbar-static-top
 - B. .navbar-fixed
 - C. .navbar-fixed-top
 - D. None of the above.
12. Which of the following bootstrap style is used to align .nav links, forms, buttons, or text to left or right in a .navbar?
- A. .navbar-align
 - B. .navbar-left, .navbar-right
 - C. .alignment
 - D. None of the above.
13. A standard navigation tab is created with:
- A. <ul class="navigation-tabs">
 - B. <ul class="nav nav-navbar">
 - C. <ul class="nav nav-tabs">
 - D. <ul class="nav tabs">
14. Which class is used to create a black navigation bar?
- A. <nav class="navigationbar navbar-default">
 - B. <nav class="navbar navbar-dark">
 - C. <nav class="navbar navbar-black">
 - D. <nav class="navbar navbar-inverse">
15. Which of the following is the default layout of a bootstrap form?
- A. .inline
 - B. .horizontal
 - C. .vertical
 - D. None of the above.

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|---------|---------|
| 1. B | 2. C | 3. D | 4. True | 5. True |
| 6. B | 7. A | 8. B | 9. B | 10. C |
| 11. A | 12. B | 13. C | 14. D | 15. C |

Review Questions

1. What is a navbar? How the navbar is useful for the website.
2. Explain the process of creating a navbar using bootstrap.
3. Explain why to choose bootstrap breadcrumb?
4. Differentiate between the bootstrap navbar and the breadcrumb.
5. Write a code that displays the bootstrap navbar in the web browser.



Further Readings

- Bootstrap by Example, Silvio Morato
- Learning Bootstrap 4, Matt Lambert
- Bootstrap in 24 Hours, By Sams
- Jump Start Bootstrap,



Web Links

- <https://getbootstrap.com/docs/4.1/layout/overview/>
- <https://getbootstrap.com/docs/4.1/layout/grid/>

Unit 06: Navigability Elements

CONTENTS

Objectives

Introduction

6.1 Pagination

6.2 Labels and Badges

6.3 Typography

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand pagination
- Design labels and badges
- Create and understand typography using bootstrap

Introduction

Bootstrap pagination is a component used to indicate the existence of a series of related content across multiple pages and enables navigation across them.

Not all sites can have all their information on a single page. Websites may need to use multiple pages for easier navigation, better user experience, buyers' journey, persona, etc. A good example here would be e-commerce sites. It would be impractical to have a site like Amazon list all of its products in one category on one page. Sometimes, a product's images and descriptions could also be split across multiple pages if needed.

6.1 Pagination

Bootstrap pagination is a component used to indicate the existence of a series of related content across multiple pages and enables navigation across them.

We use a large block of connected links for our pagination, making links hard to miss and easily scalable—all while providing large hit areas. Pagination is built with a list of HTML elements so screen readers can announce the number of available links. You can use a wrapping `<nav>` element to identify it as a navigation section to screen readers and other assistive technologies.



Did you Know?

Pagination is a sequence of pages that are connected and have similar content.

**Example**

To create a basic pagination, add the .pagination class to an ul element:

```
<nav aria-label="Page navigation example">
<ul class="pagination pg-blue">
<li class="page-item"><a class="page-link">Previous</a></li>
<li class="page-item"><a class="page-link">1</a></li>
<li class="page-item"><a class="page-link">2</a></li>
<li class="page-item"><a class="page-link">3</a></li>
<li class="page-item"><a class="page-link">Next</a></li>
</ul>
</nav>
```



6.2 Labels and Badges

Bootstrap labels are used to specify additional information about something like offering counts, tips, or other makeup for pages.

The class .label is used to display the labels.

**Example**

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Example</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
                                                                    rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css">
<script src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>
<div class="container">
<h2>Labels Example</h2>
```



```

<h1>This is Lable<span class="label label-default">New</span></h1>
<h2>This is Lable<span class="label label-default">New</span></h2>
<h3>This is Lable<span class="label label-default">New</span></h3>
<h4>This is Lable<span class="label label-default">New</span></h4>
<h5>This is Lable<span class="label label-default">New</span></h5>
<h6>This is Lable<span class="label label-default">New</span></h6>
</div>

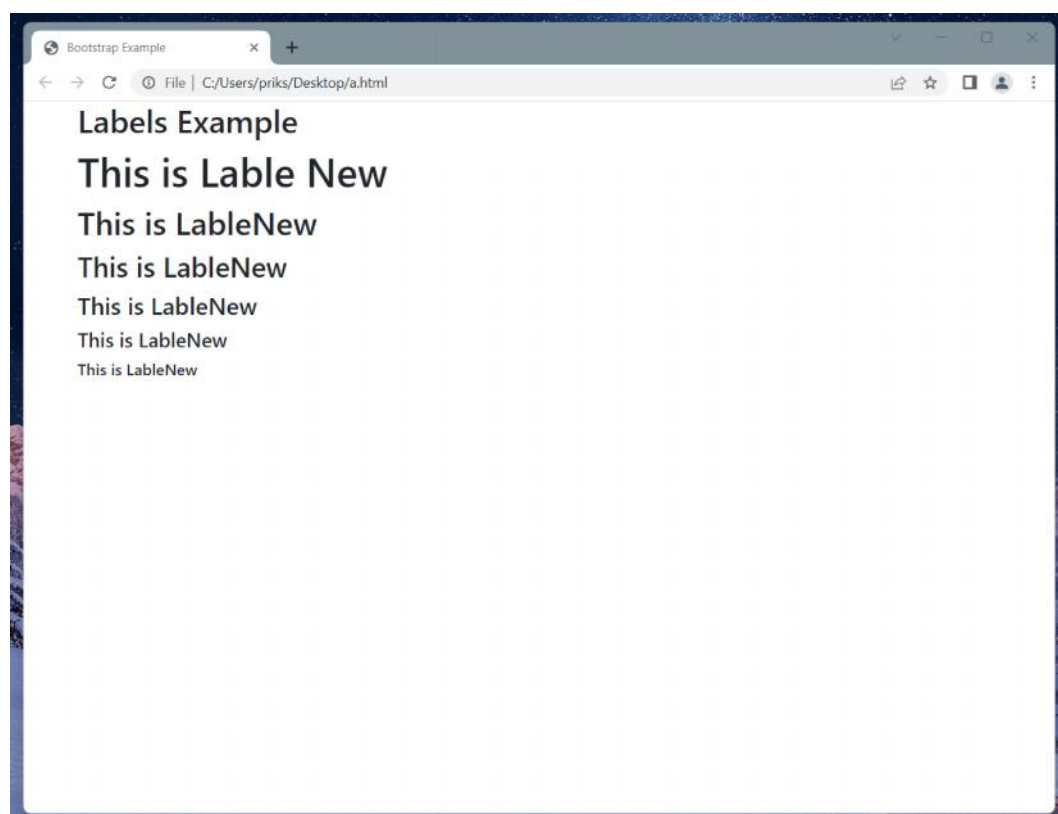
```

```
</body>
```

```
</body>
```

```
</html>
```

Output



Example

Bootstrap Contextual Label

```

<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Contextual Label</title>
<meta charset="utf-8">

```



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

<link
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css"
rel="stylesheet"

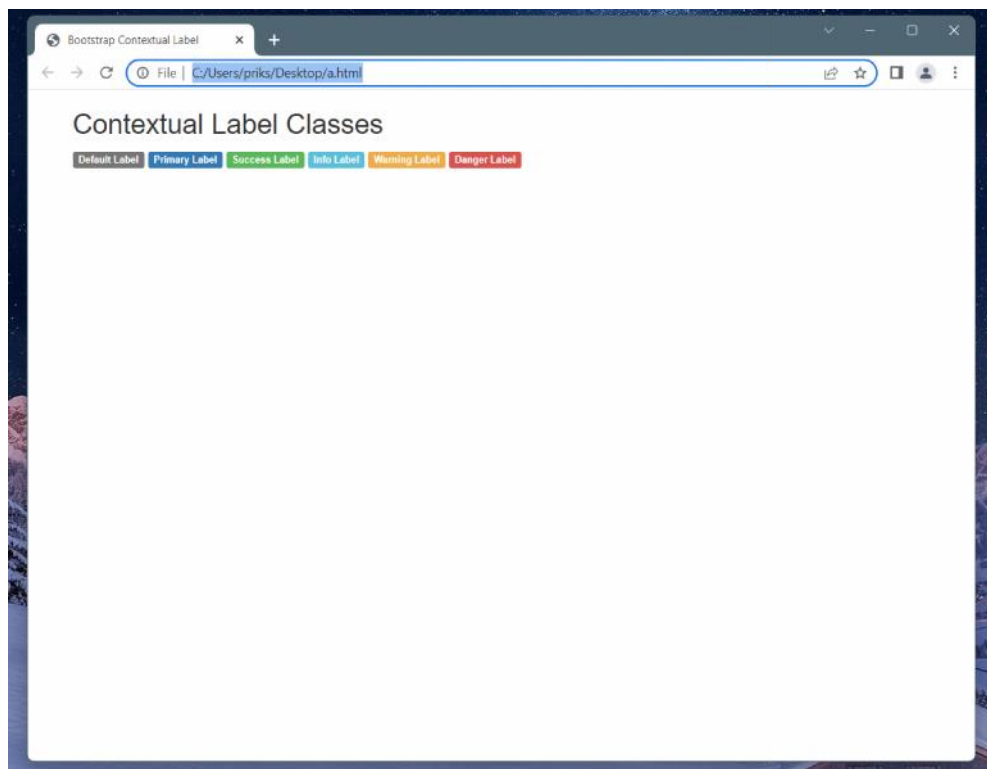
</head>

<body>

<div class="container">
<h2>Contextual Label Classes</h2>
<span class="label label-default">Default Label</span>
<span class="label label-primary">Primary Label</span>
<span class="label label-success">Success Label</span>
<span class="label label-info">Info Label</span>
<span class="label label-warning">Warning Label</span>
<span class="label label-danger">Danger Label</span>
</div>

<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.0/jquery.min.js"></script>
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/js/bootstrap.min.js"></script>

</body>
</html>
```



Bootstrap Badges are numerical indicators used to show how many items are associated with a specific link. Badges are used to highlight new or unread items.

The class `.badge` within the `` element is used to create badges.

Pill badges are used to make the badges more round. Use the class `.badge-pill` class to add pill badges.



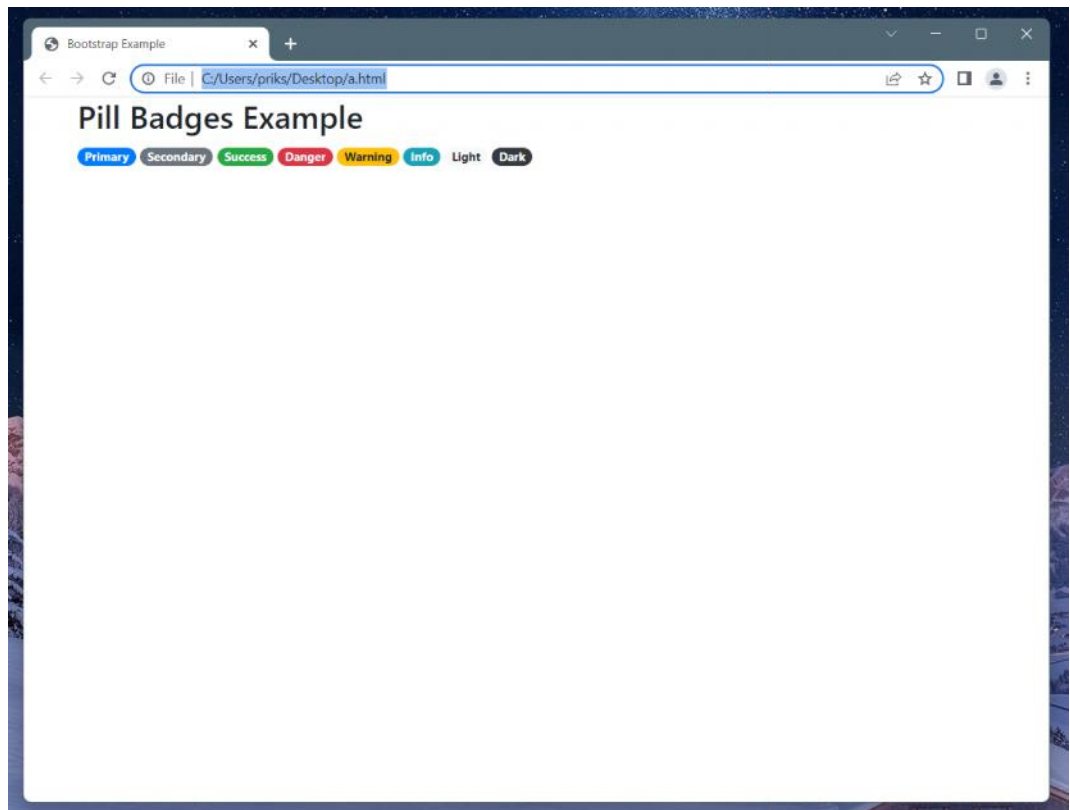
Example

Pill Badges Example

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Example</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css" rel="stylesheet"
<script src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>
<body>
<div class="container">
<h2>Pill Badges Example</h2>
<span class="badge badge-pill badge-primary">Primary</span>
<span class="badge badge-pill badge-secondary">Secondary</span>
<span class="badge badge-pill badge-success">Success</span>
<span class="badge badge-pill badge-danger">Danger</span>
<span class="badge badge-pill badge-warning">Warning</span>
<span class="badge badge-pill badge-info">Info</span>
<span class="badge badge-pill badge-light">Light</span>
<span class="badge badge-pill badge-dark">Dark</span>
</div>

</body>
</body>
</html>
```

Output



6.3 Typography

Typography is one of the latest features of bootstrap. It's especially used for styling and formatting text elements. Using the typography feature of bootstrap, someone can create headings, paragraphs, some other inline elements, and lists. Basically bootstrap uses 1rem (16px) as font size including line-height remains 5. By default, font families used by bootstrap are sans-serif, Arial; it sets how the contents should display on the body, background color on the body, uses font size and line height to create margins, paddings, etc.

Features of Bootstrap Typography

Headings

Code: -

`<h1>`Bootstrap Heading`</h1>` displayed in font-size

`<h2>`Bootstrap Heading`</h2>` displayed in font-size

`<h3>`Bootstrap Heading`</h3>` displayed in font-size

Responsive Headings

Responsive headings are one of the best things one can design using typography. These are the elements in which text gets adjusted automatically by using class responsive as per device size. So one can easily see the same text in an appropriate way on different devices.

Just add class responsive in your header tag as follows:

```
<h5 class="h5-responsive"> Responsive Header</h5>
```

<small>

This tag is used to create lighter, smaller, secondary text in your heading. By default, it sets to 85% of the size of the parent heading.

`<h5>Example heading <small>secondary text</small></h5>`

`<mark>`

This tag is used to highlight text.

`<h2>Bootstrap Typography</h2>`

`<p>This is used to <mark>highlight</mark> text.</p>`

`<abbr>`

This tag is used to mark an abbreviation. Abbreviations have a default underline and gain a help cursor to provide additional context on hover and to users of assistive technologies.

`<p>There are so many countries in the world.<abbr>India</abbr>is the best country</p>`

``

Indicates deleted text

`<p>This tag is used to show deleted text.</p>`

`<blockquote>`

`<h1>Blockquotes</h1>`

`<p>The blockquote element is used to present content from another source:</p>`

`<blockquote>`

`<p>Very little is needed to make a happy life; it is all within yourself, in your way of thinking. Life is like playing a violin in public and learning the instrument as one goes on. </p></blockquote>`

`<dl>`

This tag is used to display a description list.

`<p>The dl element indicates a description list:</p>`

`<dl>`

`<dt>Bread</dt>`

`<dd>- White</dd>`

`<dd>- Brown</dd>`

`<dt>Cold Drinks</dt>`

`<dd>- Pepsi</dd>`

`</dl>`

`<code>`

`<p>The following HTML elements: <code>span</code>, <code>section</code>, and <code>div</code> defines a section in a document.</p>`

Contextual Colors

This is nothing but a different class that is used to convey meaning using different colors. It's having different classes like `.text-muted`, `.text-info`, `.text-primary`, `.text-success`, `.text-warning`, `.text-danger`.

**Example**

```
<p>Use the contextual classes to provide "meaning through colors":</p>
<p class="text-muted">This text is muted.</p>
<p class="text-primary">This text is important.</p>
<p class="text-success">This text indicates success.</p>
<p class="text-info">This text represents some information.</p>
<p class="text-warning">This text represents a warning.</p>
<p class="text-danger">This text represents danger.</p>
```

Summary

- Most of web designers prefer to use bootstrap typography for a better look and feel of text format.
- Bootstrap Typography is customized in a simple manner to present attractively to the end-user.
- Bootstrap uses Helvetica Neue, Helvetica, Arial, and sans-serif in its default font stack.
- Using the typography feature of Bootstrap you can create headings, paragraphs, lists and other inline elements.

Keywords

Navbar : A navigation bar (or navigation system) is a section of a graphical user interface intended to aid visitors in accessing information. Navigation bars are implemented in file browsers, web browsers and as a design element of some web sites.

Breadcrumb Navigation : Breadcrumbs are a secondary navigation aid that helps users easily understand the relation between their location on a page (like a product page) and higher level pages (a category page, for instance).

Pagination :Bootstrap pagination is a component used to indicate the existence of a series of related content across multiple pages and enables navigation across them.

SelfAssessment

1. The advantage of pages in paging is
 - A. no logical relation with program
 - B. no need of entire segment of task in physical memory
 - C. reduction of memory requirement for task
 - D. all of the mentioned
2. The size of the pages in the paging scheme is
 - A. Variable
 - B. Fixed
 - C. both variable and fixed
 - D. none
3. Bootstrap's grid system allows up to ____ columns across the page.

- A. 12
 - B. 13
 - C. 14
 - D. 11
4. How many Container class are there in Bootstrap?
- A. 1
 - B. 2
 - C. 3
 - D. 4
5. Which class is used for creating pagination?
- A. Page
 - B. Pager
 - C. Pagination
 - D. Link-pagination
6. Bootstrap is a free front-end framework.
- A. True
 - B. False
7. Documentation and examples for showing _____ to indicate a series of related content exists across multiple pages.
- A. Pagination
 - B. Margin
 - C. Table
 - D. List
8. Use .disabled for links that appear un-clickable and .active to indicate the current page.
- A. True
 - B. False
9. Add .pagination-lg or .pagination-sm for additional sizes large and small respectively.
- A. True
 - B. False
10. _____ modifier class to make badges more rounded.
- A. .badge-pill
 - B. .bag
 - C. .lable-lg
 - D. .badges
11. Which of the following is not part of the responsive heading?
- A. <small>
 - B. <mark>
 - C.
 - D. <nav>
12. _____ is especially used for styling and formatting text elements.
- A. Typography
 - B. Navigation

- C. Pagination
- D. Lists

13. Headings and responsive headings both are the features of typography.

- A. True
- B. False

14. The class _____ is used to display the labels.

- A. .class
- B. .lable
- C. .nav
- D. .heading

15. Pagination is a _____ of pages that are connected and have similar content.

- A. Sequence
- B. Matter
- C. Class
- D. Stack

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. D | 2. B | 3. A | 4. B | 5. C |
| 6. A | 7. A | 8. A | 9. A | 10. A |
| 11. D | 12. A | 13. A | 14. B | 15. A |

Review Questions

1. What do you mean by labels and badges in bootstrap? Explain with a suitable example.
2. How is pagination done using bootstrap? Comment.
3. Explain the following with a suitable example.
 - i. Badges
 - ii. Pagination
4. Why do we need pagination on the website? Comment.
5. Explain the difference between label and badges.



Further Readings

Bootstrap by Example, Silvio Morato
Learning Bootstrap 4, Matt Lambert
Bootstrap in 24 Hours, By Sams
Jump Start Bootstrap,



Web Links

<https://getbootstrap.com/docs/4.1/layout/overview/>
<https://getbootstrap.com/docs/4.1/layout/grid/>

Unit 07: Bootstrap CSS

CONTENTS

Objectives

Introduction

7.1 Bootstrap Tables

7.2 Bootstrap Buttons

7.3 Images using Bootstrap

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand tables using bootstrap
- Design buttons and tables
- Insert and understand images using bootstrap

Introduction

Generally, Bootstrap 4 is distributed using the repositories Bower (via Github) and NPM (node package manager). Moreover, you also can create your own distribution and use the source code that connects/links directly to the website.¹ Bootstrap also utilizes the raw files of the cascading stylesheets language SASS – this is a precompiler that translates into CSS (unlike its predecessor, Bootstrap 3, where the primary language was LESS).

7.1 Bootstrap Tables

Using the most basic table markup, here's how .table-based tables look in Bootstrap. All table styles are inherited in Bootstrap 4, meaning any nested tables will be styled in the same manner as the parent.

A basic Bootstrap table has light padding and only horizontal dividers.

The .table class adds basic styling to a table:



Example

```
<!DOCTYPE html>
```

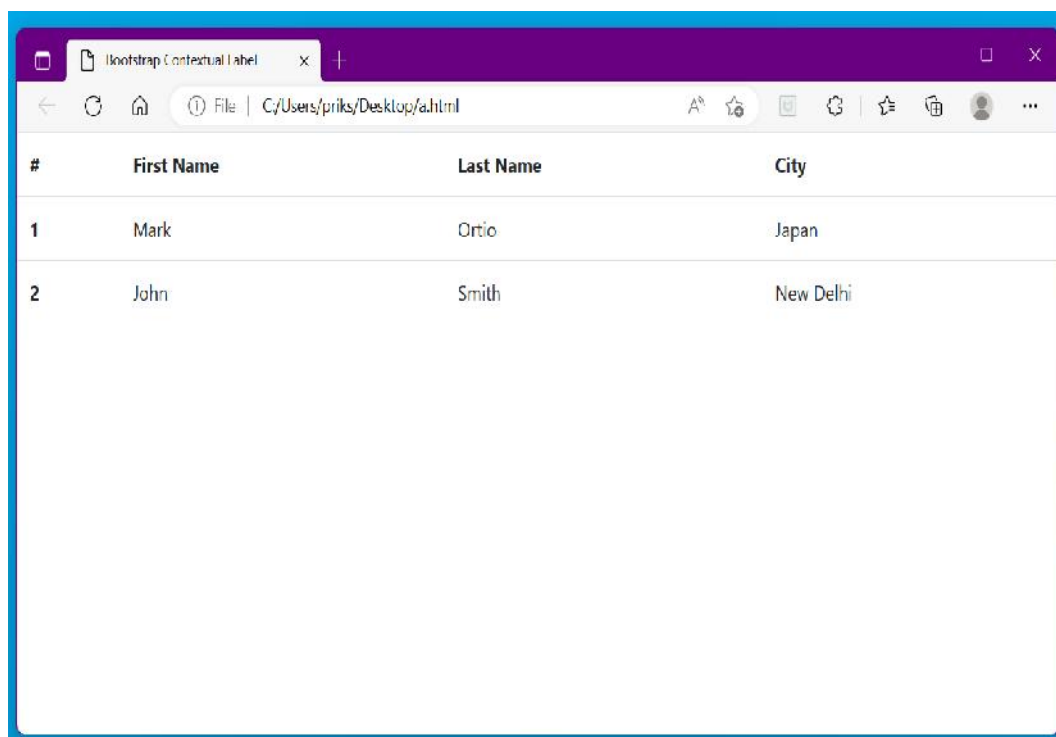
```
<html lang="en">
```

```
<head>
```



```
<title>Bootstrap Contextual Label</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
rel="stylesheet"
</head>
<body>
<table class="table">
<thead>
<tr>
<th scope="col">#</th>
<th scope="col">First Name</th>
<th scope="col">Last Name</th>
<th scope="col">City</th>
</tr>
</thead>
<tbody>
<tr>
<th scope="row">1</th>
<td>Mark</td>
<td>Ortio</td>
<td>Japan</td>
</tr>
<tr>
<th scope="row">2</th>
<td>John</td>
<td>Smith</td>
<td>New Delhi</td>
</tr>
</tbody>
</table>
</body>
</html>
```

Output



#	First Name	Last Name	City
1	Mark	Ortio	Japan
2	John	Smith	New Delhi

You can also invert the colors – with light text on dark backgrounds – with `.table-dark`.



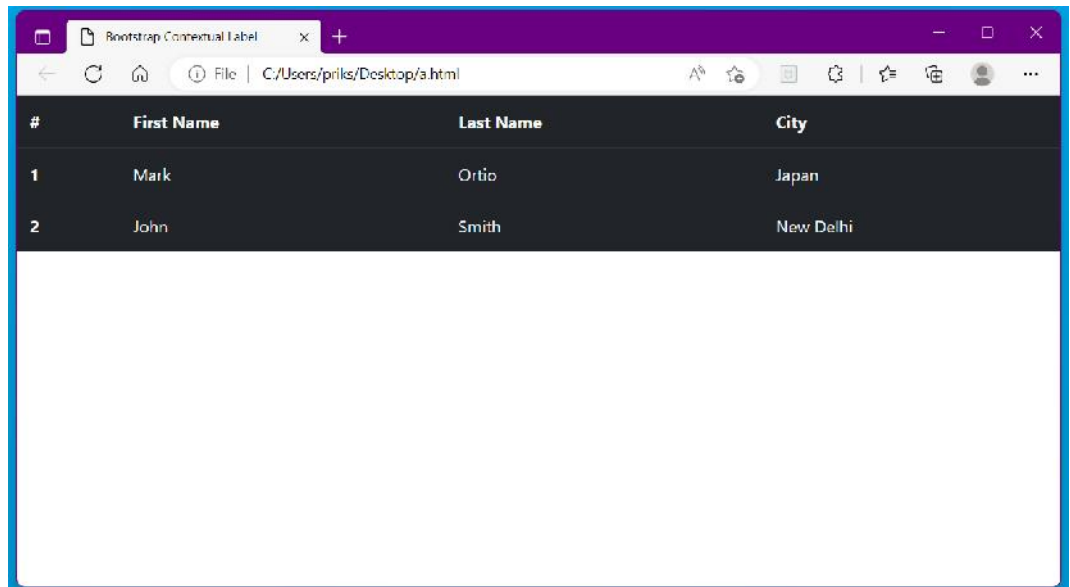
Example

```
<table class="table table-dark">
<thead>
<tr>
<th scope="col">#</th>
<th scope="col">First Name</th>
<th scope="col">Last Name</th>
<th scope="col">City</th>
</tr>
</thead>
<tbody>
<tr>
<th scope="row">1</th>
<td>Mark</td>
<td>Ortio</td>
<td>Japan</td>
</tr>
<tr>
<th scope="row">2</th>
<td>John</td>
<td>Smith</td>
<td>New Delhi</td>
</tr>
```



```
</tbody>
</table>
```

Output



#	First Name	Last Name	City
1	Mark	Ortio	Japan
2	John	Smith	New Delhi

Striped rows

Use .table-striped to add zebra-striping to any table row within the <tbody>.

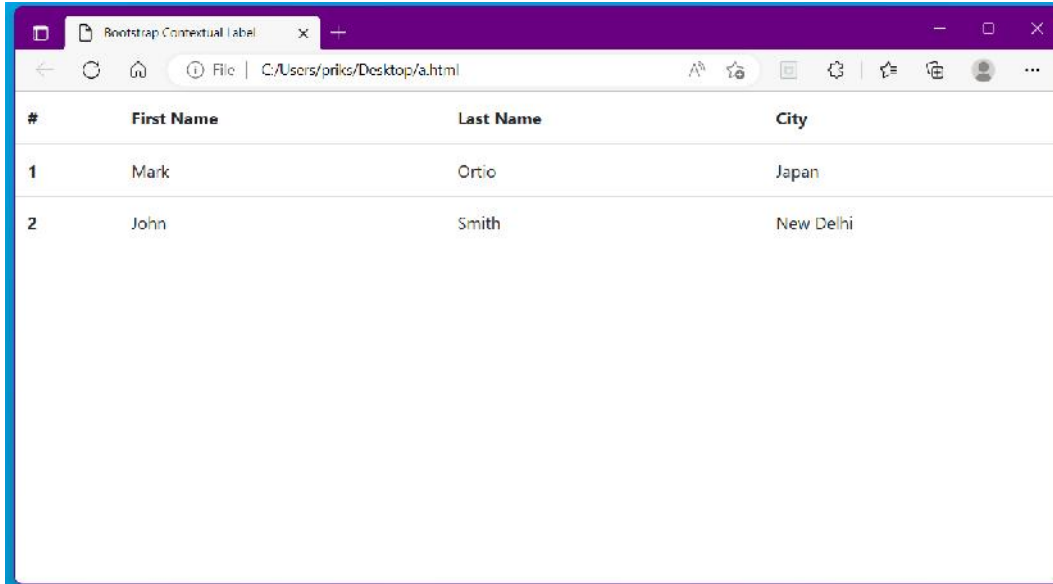
Code

```
<table class="table table-striped">
<thead>
<tr>
<th scope="col">#</th>
<th scope="col">First Name</th>
<th scope="col">Last Name</th>
<th scope="col">City</th>
</tr>
</thead>
<tbody>
<tr>
<th scope="row">1</th>
<td>Mark</td>
<td>Ortio</td>
<td>Japan</td>
</tr>
<tr>
<th scope="row">2</th>
<td>John</td>
<td>Smith</td>
```



```
<td>New Delhi</td>
</tr>
</tbody>
</table>
```

Output



#	First Name	Last Name	City
1	Mark	Ortio	Japan
2	John	Smith	New Delhi

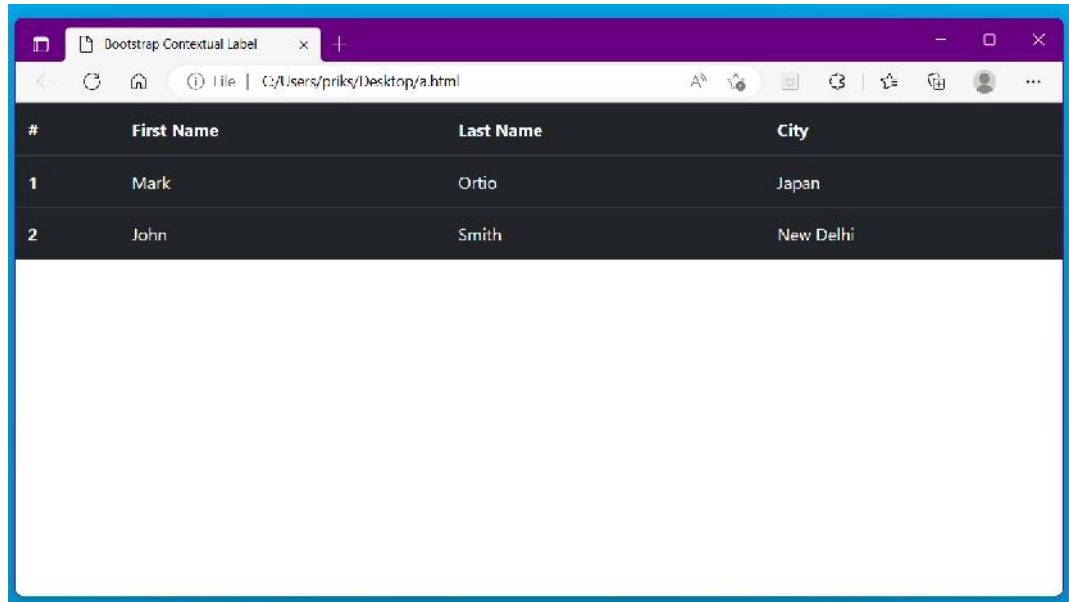
#code (table table-stripped table-dark)

```
<table class="table table-stripped table-dark">
<thead>
<tr>
<th scope="col">#</th>
<th scope="col">First Name</th>
<th scope="col">Last Name</th>
<th scope="col">City</th>
</tr>
</thead>
<tbody>
<tr>
<th scope="row">1</th>
<td>Mark</td>
<td>Ortio</td>
<td>Japan</td>
</tr>
<tr>
<th scope="row">2</th>
<td>John</td>
<td>Smith</td>
<td>New Delhi</td>
```



```
</tr>
</tbody>
</table>
```

Output



#	First Name	Last Name	City
1	Mark	Ortio	Japan
2	John	Smith	New Delhi

7.2 Bootstrap Buttons

Buttons are an essential part of websites. You need them for various functionalities, from submitting information and getting access to more content to linking to different parts of the web page and other websites.

The .btn classes are designed to be used with the <button> element. However, you can also use these classes on <a> or <input> elements (though some browsers may apply a slightly different rendering).

When using button classes on <a> elements that are used to trigger in-page functionality (like collapsing content), rather than linking to new pages or sections within the current page, these links should be given a role="button" to appropriately convey their purpose to assistive technologies such as screen readers.

Button tags



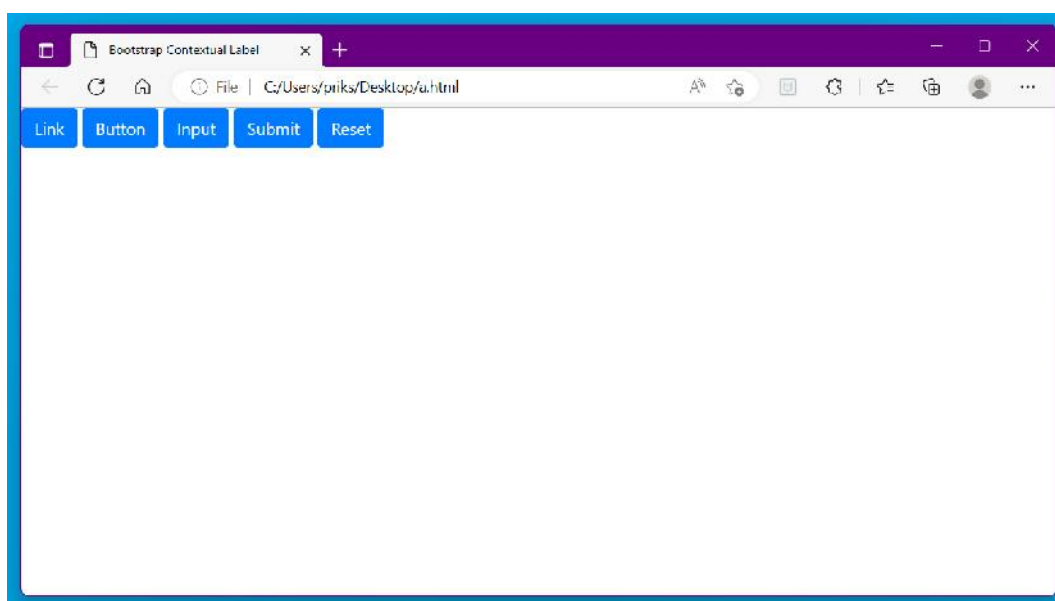
Example

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Contextual Label</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
```

rel="stylesheet"


```
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
</head>
<body>
<a class="btn btn-primary" href="#" role="button">Link</a>
<button class="btn btn-primary" type="submit">Button</button>
<input class="btn btn-primary" type="button" value="Input">
<input class="btn btn-primary" type="submit" value="Submit">
<input class="btn btn-primary" type="reset" value="Reset">
</body>
</html>
```

Output



Outline buttons

In need of a button, but not the hefty background colors they bring? Replace the default modifier classes with the `.btn-outline-*` ones to remove all background images and colors on any button.



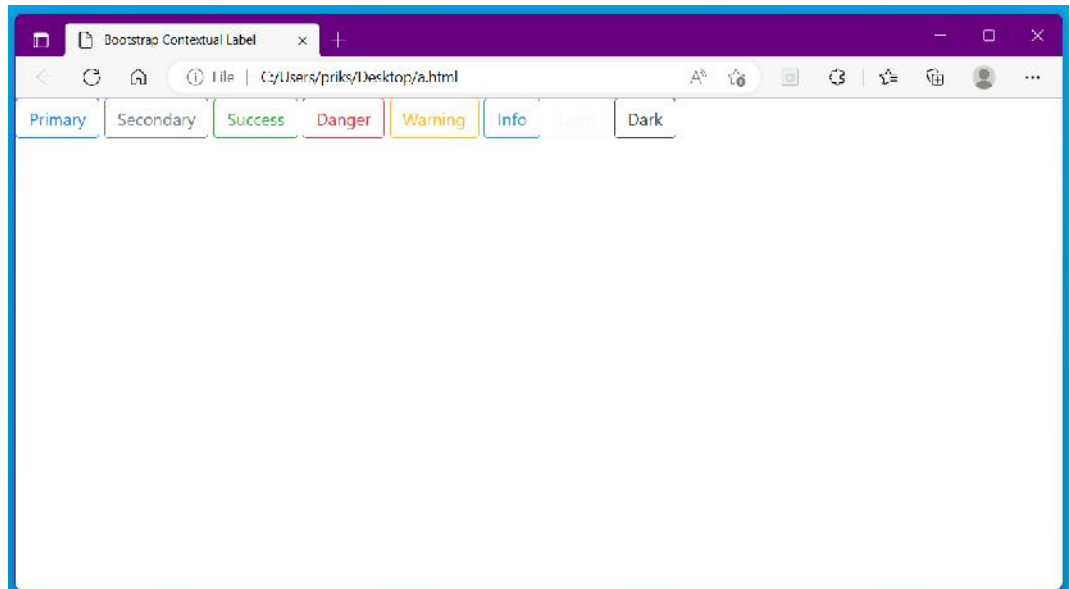
Example

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Contextual Label</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
```

rel="stylesheet"


```
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
</head>
<body>
<button type="button" class="btn btn-outline-primary">Primary</button>
<button type="button" class="btn btn-outline-secondary">Secondary</button>
<button type="button" class="btn btn-outline-success">Success</button>
<button type="button" class="btn btn-outline-danger">Danger</button>
<button type="button" class="btn btn-outline-warning">Warning</button>
<button type="button" class="btn btn-outline-info">Info</button>
<button type="button" class="btn btn-outline-light">Light</button>
<button type="button" class="btn btn-outline-dark">Dark</button>
</body>
</html>
```

Output



7.3 Images using Bootstrap

Images are an integral part of the content strategy of any website. The best images are set above the fold and act as both eye candy and informational tools. They should relate directly to the text of the page, and ideally, they should be original pictures.

Responsive images

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

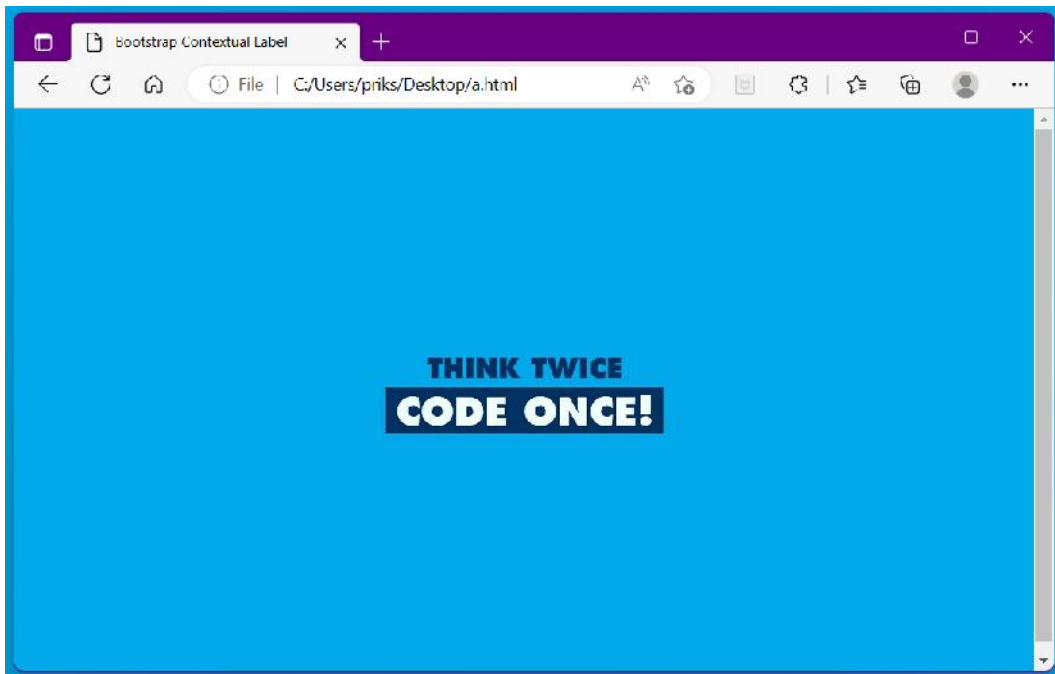
#Code

```
<!DOCTYPE html>
<html lang="en">
<head>
```



```
<title>Bootstrap Contextual Label</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
</head>
<body>
<imgsrc="./demo.jpg" class="img-fluid" alt="Responsive image">
</body>
</html>
```

Output 1



Output 2

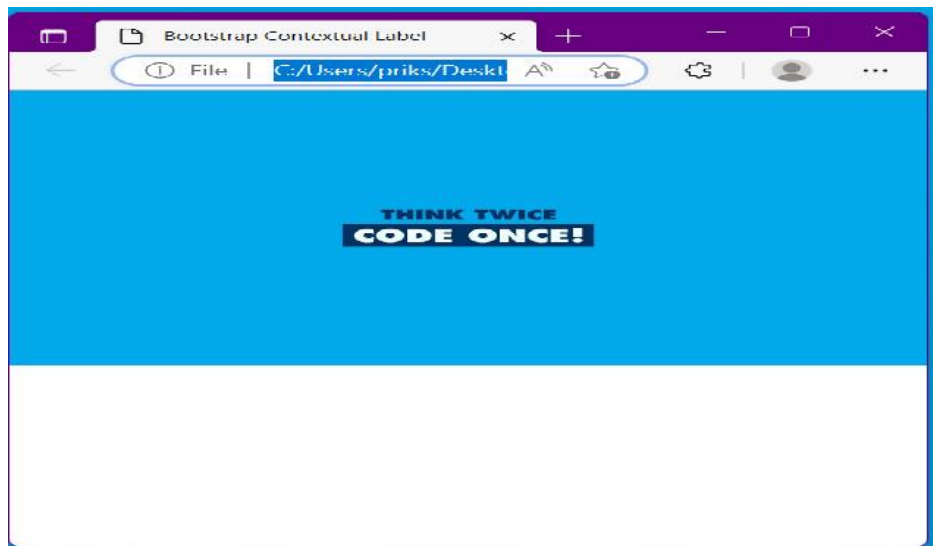


Image thumbnails

In addition to our border-radius utilities, you can use `.img-thumbnail` to give an image a rounded 1px border appearance.

Syntax : -

```
<imgsrc="..." alt="..." class="img-thumbnail">
```

Summary

- Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains HTML, CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.
- Buttons allow users to take actions, and make choices, with a single tap. Buttons communicate actions that users can take.
- Images are an integral part of the content strategy of any website. The best images are set above the fold and act as both eye candy and informational tools.
- A table is a structured set of data made up of rows and columns (tabular data).

Keywords

Tables: -A table is a structured set of data made up of rows and columns.

Buttons:-Buttons allow users to take actions, and make choices, with a single tap. Buttons communicate actions that users can take. They are typically placed throughout your website UI, and they should be easily findable and identifiable while clearly indicating the action they allow a user to complete.

Images:-Images are an integral part of the content strategy of any website. The best images are set above the fold and act as both eye candy and informational tools. They should relate directly to the text of the page, and ideally, they should be original pictures.

SelfAssessment

1. Which HTML tag is used to define a table?
A. <tb>
B. <tl>

- C. <table>
 - D. <tab>
2. With the help of which tag, is a row defined in HTML?
- A. <row>
 - B. <table-row>
 - C. <tablerow>
 - D. <tr>
3. ____ tag used for insert image.
- A.
 - B. <isetrting>
 - C. <i>
 - D. <ins-image>
4. HTML is stand for _____
- A. Hyper Text Markup Language
 - B. Holistick Technical Method Library
 - C. Hyper Tax Makes Line
 - D. None of the above
5. Images in Bootstrap are made responsive with _____.
- A. .img-fluid
 - B. .img
 - C. .responsive-image
 - D. image
6. Which of the following class styles a table with borders surrounding every element and rounded corners around the entire table?
- A. .table
 - B. .table-striped
 - C. .table-bordered
 - D. .table-hover
7. Which of the following bootstrap style of button represents a contextual button for informational alert messages?
- A. .btn
 - B. .btn-primary
 - C. .btn-success
 - D. .btn-info
8. Which of the following bootstrap style of image gives the image rounded corners?

- A. .img-rounded
 - B. .img-circle
 - C. .img-thumbnail
 - D. None of the above.
9. Which of the following class styles a table as a nice basic table with stripes on rows?
- A. .table
 - B. .table-striped
 - C. .table-bordered
 - D. .table-hover
10. Which of the following class makes thumbnail image?
- A. .img-tmbnail
 - B. .img-thumbnail-image
 - C. .img-thumb
 - D. .img-thumbnail
11. Which of the following bootstrap style helps to combine sets of into a for more complex components?
- A. .btn-group
 - B. .btn-toolbar
 - C. .btn-group-lg
 - D. .btn-group-vertical
12. Which of the following bootstrap style of image makes the entire image round by adding border-radius:500px?
- A. img-rounded
 - B. img-circle
 - C. img-thumbnail
 - D. None of the above
13. Bootstrap can add responsive images in your website.
- A. True
 - B. False
14. Which of the following is not a bootstrap class for tables?
- A. .table
 - B. table table-dark
 - C. table table-striped
 - D. table & table
15. _____ class used for insert thumbnail image in website.
- A. img-thumbnail
 - B. img

- C. t-img
- D. none of above

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 2. D | 3. A | 4. A | 5. A |
| 6. C | 7. D | 8. A | 9. B | 10. D |
| 11. B | 12. B | 13. A | 14. D | 15. A |

Review Questions

1. Why do we need the table in the website? Explain using examples.
2. What is the difference between a table and striped table?
3. Write code that displays the responsive image in webpage.
4. Explain bootstrap table using an example.
5. Write code that displays different styles of buttons in a web page.



Further Readings

Bootstrap by Example, Silvio Morato
Learning Bootstrap 4, Matt Lambert
Bootstrap in 24 Hours, By Sams
Jump Start Bootstrap,



Web Links

<https://getbootstrap.com/docs/4.1/content/images/#image-thumbnails>

Unit 08: Forms

CONTENTS

Objectives

Introduction

8.1 Icons

8.2 Fonts

8.3 Forms

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand icons using bootstrap
- Design form using bootstrap
- Insert and understand font and icon

Introduction

The Bootstrap icons decorate the webpage/website in a standard format that gives a nice look. A bootstrap icon library contains over 1300 icons with a high-quality design & free to use. In order to use such icons, we will use the Bootstrap CDN link to include it in the HTML document.

A horizontal form means that the labels are aligned next to the input field (horizontal) on large and medium screens. On small screens (767px and below), it will transform to a vertical form (labels are placed on top of each input). Additional rules for a horizontal form: Add class .form-horizontal. It provides a flexible class that encourages proper grouping of labels, controls, optional help text, and form validation messaging. By default it only applies margin-bottom, but it picks up additional styles in .form-inline as needed. Use it with <fieldset> s, <div> s, or nearly any other element.

8.1 Icons

Bootstrap bundles 140 icons into one sprite that can be used with buttons, links, navigation, and form fields. The icons are provided by GLYPHICONS; see Figure.

icon-glass	icon-music	icon-search	icon-envelope
icon-heart	icon-star	icon-star-empty	icon-user
icon-film	icon-th-large	icon-th	icon-th-list
icon-ok	icon-remove	icon-zoom-in	icon-zoom-out
icon-off	icon-signal	icon-cog	icon-trash
icon-home	icon-file	icon-time	icon-road
icon-download-alt	icon-download	icon-upload	icon-inbox
icon-play-circle	icon-repeat	icon-refresh	icon-list-alt
icon-lock	icon-flag	icon-headphones	icon-volume-off
icon-volume-down	icon-volume-up	icon-groove	icon-barcode
icon-tag	icon-tags	icon-book	icon-bookmark
icon-print	icon-camera	icon-font	icon-bold
icon-italic	icon-text-height	icon-text-width	icon-align-left
icon-align-center	icon-align-right	icon-align-justify	icon-list
icon-indent-left	icon-indent-right	icon-facetime-video	icon-picture
icon-pencil	icon-map-marker	icon-adjust	icon-tint
icon-edit	icon-share	icon-check	icon-move
icon-step-backward	icon-fast-backward	icon-backward	icon-play
icon-pause	icon-stop	icon-forward	icon-fast-forward
icon-step-forward	icon-eject	icon-chevron-left	icon-chevron-right
icon-plus-sign	icon-minus-sign	icon-remove-sign	icon-ok-sign
icon-question-sign	icon-info-sign	icon-screenshot	icon-remove-circle
icon-ok-circle	icon-ban-circle	icon-arrow-left	icon-arrow-right
icon-arrow-up	icon-arrow-down	icon-share-alt	icon-resize-full
icon-resize-small	icon-plus	icon-minus	icon-asterisk
icon-exclamation-sign	icon-gift	icon-leaf	icon-fire
icon-eye-open	icon-eye-close	icon-warning-sign	icon-plane
icon-calendar	icon-random	icon-comment	icon-magnet
icon-chevron-up	icon-chevron-down	icon-retweet	icon-shopping-cart
icon-folder-close	icon-folder-open	icon-resize-vertical	icon-resize-horizontal
icon-hdd	icon-bullhorn	icon-bell	icon-certificate
icon-thumbs-up	icon-thumbs-down	icon-hand-right	icon-hand-left
icon-hand-up	icon-hand-down	icon-circle-arrow-right	icon-circle-arrow-left
icon-circle-arrow-up	icon-circle-arrow-down	icon-globe	icon-wrench
icon-tasks	icon-filter	icon-briefcase	icon-fullscreen

GLYPHICONS Attribution

Users of Bootstrap are fortunate to use the GLYPHICONS for free on Bootstrap projects. The developers have asked that you link back to GLYPHICONS when practical. GLYPHICONS Halfings are normally not available for free, but an arrangement between Bootstrap and the GLYPHICONS creators have made this possible at no cost to you as developers. As a thank you, we ask you to include an optional link back to GLYPHICONS whenever practical.

Usage

To use the icons, simply use an `<i>` tag with the namespaced `.icon-` class. For example,

if you want to use the edit icon, you add the `.icon-edit` class to the `<i>` tag:

```
<i class="icon-edit"></i>
```

If you want to use the white icon, simply add the `.icon-white` class to the tag:

```
<i class="icon-edit icon-white"></i>
```

8.2 Fonts

Starting with typography, Bootstrap uses Helvetica Neue, Helvetica, Arial, and sans-serif in its default font stack. These are all standard fonts and are included as default on all major computers. If by chance these fonts don't exist, they fall back to sans-serif (the catchall) to tell the browser to use the default font for the browser. All body copy has the font-size set at 14 pixels, with the line-height set at 20 pixels. The `<p>` tag has a margin-bottom of 10 pixels, or half the line-height.



Did you know?

Font Awesome CSS

<https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-free@6.2.1/css/fontawesome.min.css>

- To add some other style fonts.
- The complete set of 675 icons in Font Awesome 4.7.0 You asked, Font Awesome delivers 41 shiny new icons in version 4.7. Want to request new icons? Here's how.

Typography

Typography is one of the latest features of bootstrap. It's especially used for styling and formatting text elements. Using the typography feature of bootstrap, someone can create headings, paragraphs, some other inline elements, and lists. Basically bootstrap uses 1rem (16px) as font size including line-height remains 5. By default, font families used by bootstrap are sans-serif, Arial; it sets how the contents should display on the body, background color on the body, uses font size and line height to create margins, paddings, etc.

Features of Bootstrap Typography

Headings

Code: -

`<h1>Bootstrap Heading</h1>` displayed in font-size

`<h2>Bootstrap Heading</h2>` displayed in font-size

`<h3>Bootstrap Heading</h3>` displayed in font-size



Did you Know?

Bootstrap 4 uses a default font-size of 16px, and its line-height is 1.5.

The default font-family is "Helvetica Neue", Helvetica, Arial, sans-serif.

In addition, all `<p>` elements have margin-top: 0 and margin-bottom: 1rem (16px by default).

h1 Bootstrap heading (2.5rem = 40px)

h2 Bootstrap heading (2rem = 32px)

h3 Bootstrap heading (1.75rem = 28px)

h4 Bootstrap heading (1.5rem = 24px)

h5 Bootstrap heading (1.25rem = 20px)

h6 Bootstrap heading (1rem = 16px)

Responsive Headings

Responsive headings are one of the best things one can design using typography. These are the elements in which text gets adjusted automatically by using class responsive as per device size. So one can easily see the same text in an appropriate way on different devices.

Just add class responsive in your header tag as follows:

`<h5 class="h5-responsive"> Responsive Header</h5>`

`<small>`

This tag is used to create lighter, smaller, secondary text in your heading. By default, it sets to 85% of the size of the parent heading.

`<h5>Example heading <small>secondary text</small></h5>`

`<mark>`

This tag is used to highlight text.

`<h2>Bootstrap Typography</h2>`

`<p>This is used to <mark>highlight</mark>text.</p>`

`<abbr>`

This tag is used to mark an abbreviation. Abbreviations have a default underline and gain a help cursor to provide additional context on hover and to users of assistive technologies.

`<p>There are so many countries in the world.<abbr>India</abbr>is the best country</p>`

``

Indicates deleted text

`<p>This tag is used to show deleted text.</p>`

`<blockquote>`

`<h1>Blockquotes</h1>`

`<p>The blockquote element is used to present content from another source:</p>`

`<blockquote>`

`<p>Very little is needed to make a happy life; it is all within yourself, in your way of thinking.Life is like playing a violin in public and learning the instrument as one goes on. </p></blockquote>`

`<dl>`

This tag is used to display a description list.

`<p>The dl element indicates a description list:</p>`

`<dl>`

`<dt>Bread</dt>`

`<dd>- White</dd>`

`<dd>- Brown</dd>`

`<dt>Cold Drinks</dt>`

`<dd>- Pepsi</dd>`

`</dl>`

More Typography Classes

Class	Description
.font-weight-bold	Bold text
.font-weight-bolder	Bolder text
.font-italic	Italic text
.font-weight-light	Light weight text
.font-weight-lighter	Lighter weight text
.lead	Makes a paragraph stand out
.small	Indicates smaller text (set to 80% of the size of the parent)
.text-left	Indicates left-aligned text
.text-*-left	Indicates left-aligned text on small, medium, large or xlarge screens
.text-break	Prevents long text from breaking layout
.text-center	Indicates center-aligned text
.text-*-center	Indicates center-aligned text on small, medium, large or xlarge screens
.text-decoration-none	Removes the underline from a link
.text-right	Indicates right-aligned text
.text-*-right	Indicates right-aligned text on small, medium, large or xlarge screens
.text-justify	Indicates justified text
.text-monospace	Monospaced text
.text-nowrap	Indicates no wrap text
.text-lowercase	Indicates lowercased text
.text-reset	Resets the color of a text or a link (inherits the color from its parent)
.text-uppercase	Indicates uppercased text
.text-capitalize	Indicates capitalized text
.initialism	Displays the text inside an <abbr> element in a slightly smaller font size
.list-unstyled	Removes the default list-style and left margin on list items (works on both and). This class only applies to immediate children list items (to remove the default list-style from

	any nested lists, apply this class to any nested lists as well)
.list-inline	Places all list items on a single line (used together with .list-inline-item on each elements)
.pre-scrollable	Makes a <pre> element scrollable
.initialism	Displays the text inside an <abbr> element in a slightly smaller font size
.list-unstyled	Removes the default list-style and left margin on list items (works on both and). This class only applies to immediate children list items (to remove the default list-style from any nested lists, apply this class to any nested lists as well)
.list-inline	Places all list items on a single line (used together with .list-inline-item on each elements)

8.3 Forms

Instead of using the default class-based forms from Chapter 2, forms that are in the navbar use the .navbar-form class. This ensures that the form's margins are properly set and match the nav stylings (see Figure). Of note, .pull-left and .pull-right helper classes may help move the form into the proper position:

```
<form class="navbar-form pull-left">
<input type="text" class="span2" id="fname">
<button type="submit" class="btn">
</form>
```

To add rounded corners (see Figure), as seen in the search inputs of iOS devices, use the .navbar-search class instead of the .navbar-form:

```
<form class="navbar-search" accept-charset="utf-8">
<input type="text" class="search-query" placeholder="Search">
</form>
```




Example - Here's a quick example to demonstrate Bootstrap's form styles. Keep reading for documentation on required classes, form layout, and more.

#Code

```
<form>
<div class="form-group">
<label for="exampleInputEmail">Email address</label>
<input type="email" class="form-control" id="exampleInputEmail" aria-describedby="emailHelp"
placeholder="Enter email">
<small id="emailHelp" class="form-text text-muted">We'll never share your email with anyone
else.</small>
</div>
<div class="form-group">
<label for="exampleInputPassword1">Password</label>
<input type="password" class="form-control" id="exampleInputPassword1"
placeholder="Password">
</div>
<div class="form-check">
<input type="checkbox" class="form-check-input" id="exampleCheck1">
<label class="form-check-label" for="exampleCheck1">Check me out</label>
</div>
<button type="submit" class="btn btn-primary">Submit</button>
</form>
```

Output

Form Controls

Textual form controls — like `<input>`s, `<select>`s, and `<textarea>`s — are styled with the `.form-control` class. Included are styles for general appearance, focus state, sizing, and more.

#Code

```
<form>
<div class="form-group">
```



```
<label for="exampleFormControlInput1">Email address</label>
<input      type="email"      class="form-control"      id="exampleFormControlInput1"
placeholder="name@example.com">
</div>
<div class="form-group">
<label for="exampleFormControlSelect1">Example select</label>
<select class="form-control" id="exampleFormControlSelect1">
<option>1</option>
<option>2</option>
<option>3</option>
<option>4</option>
<option>5</option>
</select>
</div>
<div class="form-group">
<label for="exampleFormControlSelect2">Example multiple select</label>
<select multiple class="form-control" id="exampleFormControlSelect2">
<option>1</option>
<option>2</option>
<option>3</option>
<option>4</option>
<option>5</option>
</select>
</div>
<div class="form-group">
<label for="exampleFormControlTextarea1">Example textarea</label>
<textarea class="form-control" id="exampleFormControlTextarea1" rows="3"></textarea>
</div>
</form>
```

Output

The screenshot shows a web browser window with the title 'Bootstrap Contextual Label'. The address bar shows the file path 'C:/Users/priks/Desktop/a.html'. The form contains the following elements:

- Email address:** A text input field with the placeholder text 'name@example.com'.
- Example select:** A single-select dropdown menu with the value '1'.
- Example multiple select:** A multiple-select dropdown menu with values '1', '2', '3', and '4'.
- Example textarea:** A text area for longer form input.

Show and Hide Content

With the class `.text-hide` contents are explicitly hidden. The application succeeds only for block elements, such as `<div>`.

```
<div class="text-hide">...</div>
```

Showing or hiding also can be made dependent on the device's width. For this purpose, the following classes are used ("`<>`" are placeholders):

- `.hidden-xs`: Hide only with "xs"
- `.hidden-sm`: Hide only with "sm"
- `.hidden-md`: Hide only with "md"
- `.hidden-lg`: Hide only with "lg"
- `.hidden-xl`: Hide only with "xl"

The classes are then available in three variants ("`<>`" are placeholders):

- `.visible-<>-block`: display: block;
- `.visible-<>-inline`: display: inline;
- `.visible-<>-inline-block`: display: inline-block;

Comparable to the code for screen content can be shown or hidden when printing, too:

- `.visible-print-block`
- `.visible-print-inline`
- `.visible-print-inline-block`
- `.hidden-print`

The final document class looks, for example, like this: `.visible-xs-block`. The area that is designated will be displayed only if the screen is less than 768 px wide.

Summary

- A horizontal form means that the labels are aligned next to the input field (horizontal) on large and medium screens known as form.
- Bootstrap 4 uses a default font-size of 16px, and its line-height is 1.5. The default font-family is “Helvetica Neue”, Helvetica, Arial, sans-serif. In addition, all <p> elements have margin-top: 0 and margin-bottom: 1rem (16px by default).
- Because Bootstrap 4 uses rem for the font-size unit of most of its elements, you can set the font-size in px on the HTML element in your own stylesheet and this will change the default sizing Bootstrap applies to your elements.
- The Bootstrap icons decorate the webpage/website in a standard format that gives a nice look. A bootstrap icon library contains over 1300 icons with a high-quality design & free to use.

Keywords

Bootstrap: Bootstrap is the most popular HTML, CSS and JavaScript framework for developing a responsive and mobile friendly website.

Icons: A website icon is a picture or a symbol that you can put on your website.

Font-awesome:Font Awesome is a font and icon toolkit based on CSS and Less.

Form: A webform, web form or HTML form on a web page allows a user to enter data that is sent to a server for processing. Forms can resemble paper or database forms because web users fill out the forms using checkboxes, radio buttons, or text fields.

SelfAssessment

1. To insert the following icon in the webpage, which of the following class used?



- A. glyphiconglyphicon-remove
- B. icon-ok
- C. glyphiconglyphicon-ok
- D. glyphiconglyphicon-th

2. To insert the following icon in webpage, which of the following class used?



- A. glyphiconglyphicon-download-alt
- B. glyphicondownload-alt
- C. download
- D. None of above

3. To insert the following icon in a webpage, which of the following class used?



- A. glyphicon-plane
- B. glyphicon-glyphicon-plane
- C. glyphicon-glyphicon-aeroplane
- D. glyphicon-glyphicon-flight

4. To insert the following icon in the webpage, which of the following class used?



- A. glyphicon-glyphicon-floppy-disk
- B. glyphicon-glyphicon-floppy-saved
- C. glyphicon-glyphicon-floppy-save
- D. glyphicon-glyphicon-floppy-open

5. _____ class indicates uppercase text.

- A. .uppercase-text
- B. .text-uppercase
- C. .text-big
- D. .text-large

6. Can we make a pre-element scrollable?

- A. Yes
- B. No

7. Bootstrap supports fonts awesome.

- A. True
- B. False

8. Bootstrap 4 h1 size is _____.

- A. 60px
- B. 45px
- C. 40px
- D. 25px

9. _____ is used to show highlighted text.

- A. <mark><\mark>
- B. <pre></pre>
- C. <u></u>
- D. <a>

10. Which of the following is not a form control?

- A. Textarea
- B. Dropdown
- C. Textbox
- D. Image slider

11. What is the default type of 'type' attribute of <input> element?

- A. Text
- B. Password
- C. Numerals
- D. Special Characters

12. week attribute defines _____

- A. week
- B. year
- C. week and year
- D. week, month and year

13. Which of the following is not used with password attribute?

- A. name
- B. size
- C. maxlength
- D. min

14. Which one of the following is a form element?

- A. text box.
- B. radio button.
- C. submit button.
- D. All of these

15. Which of the following tag is used for drop down list?

- A. <select>
- B. <text>
- C. <textarea>
- D. <dropdown>

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 2. A | 3. B | 4. A | 5. B |
| 6. A | 7. A | 8. C | 9. A | 10. D |
| 11. A | 12. C | 13. D | 14. D | 15. A |

Review Questions

- 1. Write a program that makes a login page with email and password.
- 2. Create a responsive form for user registration with following inputs.
 - I. Textbox

- II. Textarea
 - III. Radio button
 - IV. Dropdown
 - V. Button
3. What do you mean by fonts in bootstrap, explain?
 4. What is an icon? Why are icons used on websites?
 5. Define form. How form is a useful element for a website.



Further Readings

Bootstrap by Example, Silvio Morato
Learning Bootstrap 4, Matt Lambert
Bootstrap in 24 Hours, By Sams
Jump Start Bootstrap,



Web Links

<https://getbootstrap.com/docs/4.1/content/images/#image-thumbnails>
<https://bootstrap-vue.org/docs/icons/#icons-1>

Unit 09: Tabs and Pills

CONTENTS

Objectives

Introduction

9.1 Bootstrap Tabs and Pills

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand web designing
- Design tabs and pills using bootstrap

Introduction

Web design encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; user interface design; authoring, including standardized code and proprietary software; user experience design; and search engine optimization. Tabs act as the highest-order sections or categories; they are purposefully broad so the user can gradually channel into the user interface to access more specific content without having to scan all of the available content a site has to offer at once. There are two distinct types of tabs you can use. Pills are quasi-navigation components which can highly improve website clarity and increase user experience.

9.1 Bootstrap Tabs and Pills

Navigation available in Bootstrap share general markup and styles, from the base .nav class to the active and disabled states. Swap modifier classes to switch between each style.

The base .nav component is built with flexbox and provides a strong foundation for building all types of navigation components. It includes some style overrides (for working with lists), some link padding for larger hit areas, and basic disabled styling.

The base .nav component does not include any .active state. The following examples include the class, mainly to demonstrate that this particular class does not trigger any special styling.

Active Link Link Disabled

#Code


```

<ul class="nav">
<li class="nav-item">
<a class="nav-link active" href="#">Active</a>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">
<a class="nav-link disabled" href="#">Disabled</a>
</li>
</ul>

```

Tabs

Takes the basic nav from above and adds the .nav-tabs class to generate a tabbed interface.

#Code

```

<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Tabs and Pills</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous"
rel="stylesheet"
/>
</head>
<body>
<ul class="nav nav-tabs">
<li class="nav-item">
<a class="nav-link active" href="#">Active</a>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">

```

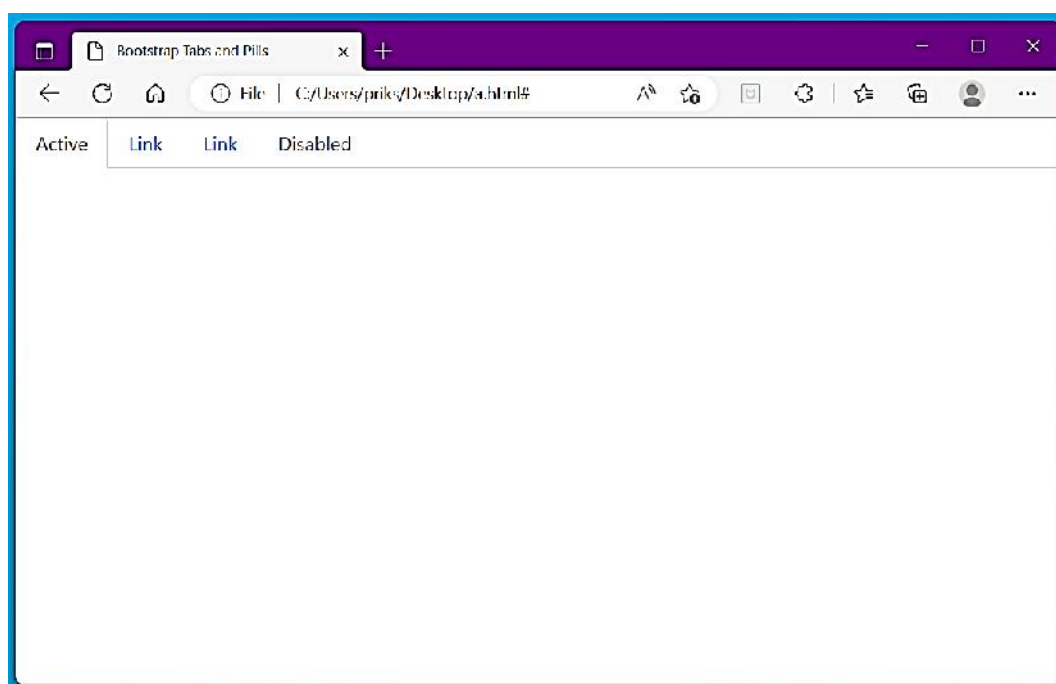


```

<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">
<a class="nav-link disabled" href="#">Disabled</a>
</li>
</ul>
</body>
</html>

```

Output



Tabs With Dropdown Menu

#Code

```

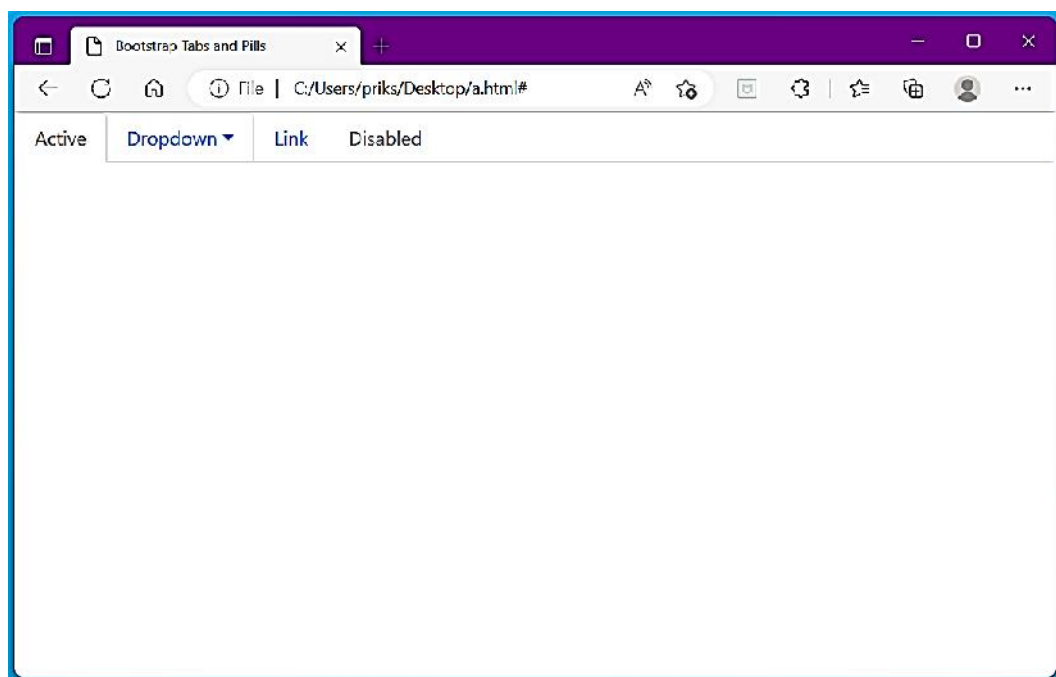
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Tabs and Pills</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
rel="stylesheet"

```



```
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
</head>
<body>
<ul class="nav nav-tabs">
<li class="nav-item">
<a class="nav-link active" href="#">Active</a>
</li>
<li class="nav-item dropdown">
<a class="nav-link dropdown-toggle" data-toggle="dropdown" href="#" role="button" aria-
haspopup="true" aria-expanded="false">Dropdown</a>
<div class="dropdown-menu">
<a class="dropdown-item" href="#">Action</a>
<a class="dropdown-item" href="#">Another action</a>
<a class="dropdown-item" href="#">Something else here</a>
<div class="dropdown-divider"></div>
<a class="dropdown-item" href="#">Separated link</a>
</div>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">
<a class="nav-link disabled" href="#">Disabled</a>
</li>
</ul>
</body>
</html>
```

Output



Pills

Pills are created with `<ul class="nav nav-pills">`. Also mark the current page with `<li class="active">`

Pills with dropdown

#Code

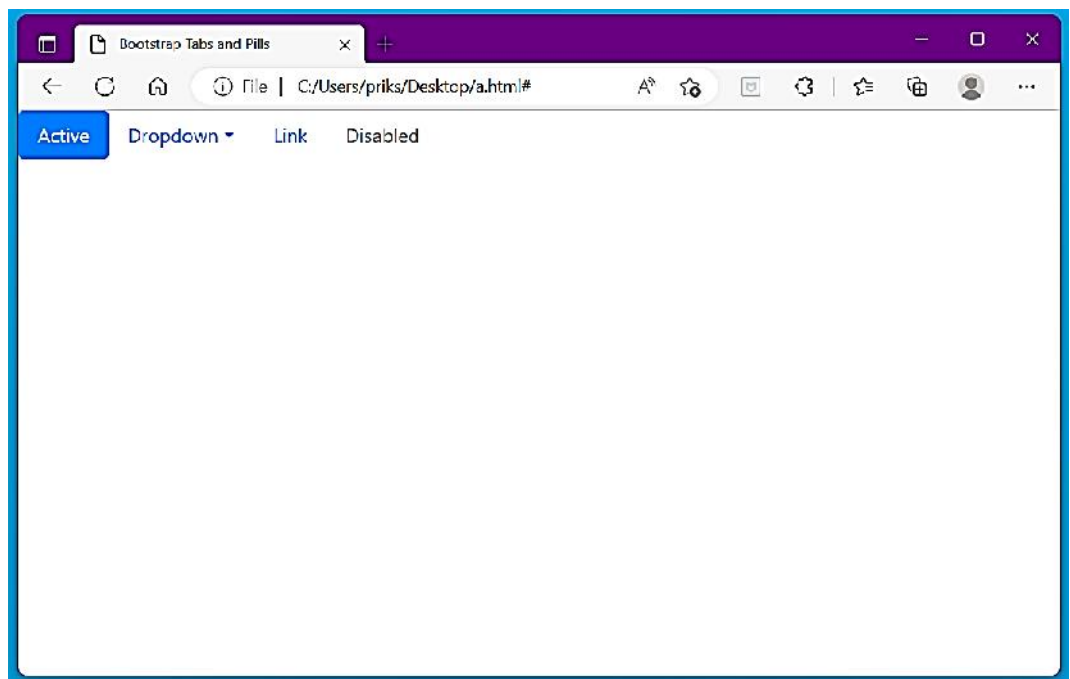
```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Bootstrap Tabs and Pills</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
rel="stylesheet"
</head>
<body>
<ul class="nav nav-pills">
<li class="nav-item">
<a class="nav-link active" href="#">Active</a>
</li>
<li class="nav-item dropdown">
<a class="nav-link dropdown-toggle" data-toggle="dropdown" href="#" role="button" aria-
haspopup="true" aria-expanded="false">Dropdown</a>
<div class="dropdown-menu">
<a class="dropdown-item" href="#">Action</a>
```



```

<a class="dropdown-item" href="#">Another action</a>
<a class="dropdown-item" href="#">Something else here</a>
<div class="dropdown-divider"></div>
<a class="dropdown-item" href="#">Separated link</a>
</div>
</li>
<li class="nav-item">
<a class="nav-link" href="#">Link</a>
</li>
<li class="nav-item">
<a class="nav-link disabled" href="#">Disabled</a>
</li>
</ul>
</body>
</html>

```

Output***Toggleable/Dynamic Tabs***

To make the tabs toggleable, add the `data-toggle="tab"` attribute to each link. Then add a `.tab-pane` class with a unique ID for every tab and wrap them inside a `<div>` element with class `.tab-content`.

If you want the tabs to fade in and out when clicking on them, add the `.fade` class to `.tab-pane`

#Code

```
<ul class="nav nav-tabs">
```



```
<li class="active"><a data-toggle="tab" href="#home">Home</a></li>
<li><a data-toggle="tab" href="#menu1">Menu 1</a></li>
<li><a data-toggle="tab" href="#menu2">Menu 2</a></li>
</ul>
```

```
<div class="tab-content">
<div id="home" class="tab-pane fade in active">
<h3>HOME</h3>
<p>Some content.</p>
</div>
<div id="menu1" class="tab-pane fade">
<h3>Menu 1</h3>
<p>Some content in menu 1.</p>
</div>
<div id="menu2" class="tab-pane fade">
<h3>Menu 2</h3>
<p>Some content in menu 2.</p>
</div>
</div>
```

Toggleable / Dynamic Pills

The same code applies to pills; only change the data-toggle attribute to data-toggle="pill".

#Code

```
<ul class="nav nav-pills">
<li class="active"><a data-toggle="pill" href="#home">Home</a></li>
<li><a data-toggle="pill" href="#menu1">Menu 1</a></li>
<li><a data-toggle="pill" href="#menu2">Menu 2</a></li>
</ul>
```

```
<div class="tab-content">
<div id="home" class="tab-pane fade in active">
<h3>HOME</h3>
<p>Some content.</p>
</div>
<div id="menu1" class="tab-pane fade">
<h3>Menu 1</h3>
<p>Some content in menu 1.</p>
</div>
<div id="menu2" class="tab-pane fade">
<h3>Menu 2</h3>
```



```
<p>Some content in menu 2.</p>  
</div>  
</div>
```

Summary

- The Bootstrap framework is built on Hypertext Markup Language (HTML), cascading style sheets (CSS) and JavaScript. Web developers using Bootstrap can build websites much faster without spending time worrying about basic commands and functions.
- Tabs is a navigation element used in web design that allows users to easily access different areas of a site or different parts of an individual page.
- Pills are static or interactive elements that allow users to input, filter, or label information.
- With Bootstrap, a navigation bar can extend or collapse, depending on the screen size.

Keywords

Navbar:The purpose of a navigation bar is to help your user browse through your website effortlessly.

Tabs:Tabs are a navigation element used in web design that allows users to easily access different areas of a site or different parts of an individual page.

Pills:Pills are quasi-navigation components that can highly improve website clarity and increase user experience.

Web Designing: Web design refers to the design of websites that are displayed on the internet. It usually refers to the user experience aspects of website development rather than software development.

SelfAssessment

1. Which of the following bootstrap style is used to add standard links to .navbar?
 - A. .navbar-link
 - B. .link
 - C. .form-link
 - D. None of the above
2. Which of the following bootstrap style is used to align .nav links, forms, buttons, or text to left or right in a .navbar?
 - A. .navbar-align
 - B. .navbar-left, .navbar-right
 - C. .alignment
 - D. None of the above.
3. Which of the following bootstrap style is to be used if you want the .navbar fixed to the top of the page?
 - A. .navbar-top
 - B. .navbar-fixed
 - C. .navbar-fixed-top

- D. None of the above.
4. Which of the following bootstrap styles are used to create tabbed navigation?
- A - .nav, .nav-tabs
- B - .nav, .nav-pills
- C - .nav, .nav-pills, .nav-stacked
- D - .nav, .nav-tabs, .nav-justified
5. Which of the following bootstrap styles are used to create a pills navigation?
- A - .nav, .nav-tabs
- B - .nav, .nav-pills
- C - .nav, .nav-pills, .nav-stacked
- D - .nav, .nav-tabs, .nav-justified
6. Which of the following bootstrap styles are used to create a vertical pills navigation?
- A - .nav, .nav-tabs
- B - .nav, .nav-pills
- C - .nav, .nav-pills, .nav-stacked
- D - .nav, .nav-tabs, .nav-justified
7. Which of the following bootstrap styles are used to create a justified tabs navigation?
- A - .nav, .nav-tabs
- B - .nav, .nav-pills
- C - .nav, .nav-pills, .nav-stacked
- D - .nav, .nav-tabs, .nav-justified
8. Which of the following bootstrap styles are used to create a disabled tab in tabs navigation?
- A - .nav, .nav-tabs, .disabled
- B - .nav, .nav-tabs
- C - .nav, .nav-pills, .nav-disabled
- D - .nav, .nav-pills
9. Which of the following bootstrap styles are used to add a dropdown to a tab?
- A - .nav, .nav-tabs, .menu
- B - .nav, .nav-tabs, dropdown-menu
- C - .nav, .nav-pills, .dropdown
- D - .nav, .nav-pills
10. Which of the following bootstrap styles are used to add a dropdown to pills?
- A - .nav, .nav-tab, .menu
- B - .nav, .nav-pills, .dropdown-menu
- C - .nav, .nav-pills, .dropdown

D - .nav, .nav-pills

11. Which of the following bootstrap style is used to add a button to the .navbar?

A - .navbar.btn

B - .btn

C - .form-.btn

D - None of the above.

12. Which of the following bootstrap style is used to add text to the .navbar?

A - .navbar-text

B - .text

C - .form-text

D - None of the above.

13. Bootstrap pills and labels are the same.

True

False

14. Bootstrap does not support tabs.

True

False

15. Which of the following class is used to create a black navigation bar?

A. .navbar-default

B. .navbar-inverse

C. .navbar-black

D. .navbar-dark

Answers for SelfAssessment

- | | | | | |
|-------|-------|-----------|-----------|-------|
| 1. A | 2. B | 3. C | 4. A | 5. B |
| 6. C | 7. D | 8. A | 9. B | 10. B |
| 11. A | 12. A | 13. False | 14. False | 15. B |

Review Questions

- What do you mean by tabs in bootstrap? Explain the working of tabs using the program.
- Why navbar is used? Explain using an example.
- If you want to design an eCommerce website, Explain the followings
 - Where you add tabs.
 - How many menu you need for the website.
- What do you mean by web designing?

5. Why navbar and tabs are useful for a website?



Further Readings

Bootstrap by Example, Silvio Morato Learning Bootstrap 4, Matt Lambert

Bootstrap in 24 Hours, By Sams Jump Start Bootstrap,



Web Links

<https://getbootstrap.com/docs/4.0/components/navs/>

<https://getbootstrap.com/docs/4.0/components/navbar/>

Unit 10: Collapse and Modals

CONTENTS

Objectives

Introduction

10.1 Content Insertion (Collapse)

10.2 The Accordion

10.3 The Modal

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Objectives

After studying this unit, you will be able to:

- Understand collapse
- Design accordions and modals using bootstrap

Introduction

Active components in bootstrap not only have support in JavaScript, but that support can be programmed directly, too. Technically there are jQuery plug-ins. If the entire bootstrap library is not used, it is possible that there some dependencies to parts of the library must be respected. Toggle the visibility of content across your project with a few classes and our JavaScript plugins.

10.1 Content Insertion (Collapse)

Similar content overlay does the content display (or content suppression, depending on how you look at it). In any case, this element is used to display only temporarily unnecessary content and then releases valuable space again.

Application

What is needed are first-inducing elements, which are either hyperlinks or buttons as shown in Listing.

- Content insertion (collapse.html)

```
<a class="btn btn-primary" role="button" data-toggle="collapse" href="#collapseExample" aria-expanded="false" aria-controls="collapseExample">Via Link</a>
```

```
<button class="btn btn-outline-danger" type="button" data-toggle="collapse" data-target="#collapseExample" aria-expanded="false" aria-controls="collapseExample"> Via Button
```

```
</button>
```

```
<div class="collapse" id="collapseExample">
```

```
<div class="card card-block card-text">
```


...

</div>

</div>

The trigger to switch the group is `data-toggle="collapse"`. This either can be a link (with `href="#targetId"`) or a button (with `data-target="selector"`). The lower portion of the message text is displayed only when one of the buttons has been clicked as shown in the following figure



The Aria support is valued internally by the script and should be complemented by matching attributes:

- `aria-expanded`: Indicates which group is open
- `aria-controls`: Indicates which group is controlled by the link
- `aria-labelledby`: Indicates which head area refers to the group



Notes: The collapse JavaScript plugin is used to show and hide content. Buttons or anchors are used as triggers that are mapped to specific elements you toggle. Collapsing an element will animate the height from its current value to 0. Given how CSS handles animations, you cannot use padding on a `.collapse` element. Instead, use the class as an independent wrapping element.



Example: Click the buttons below to show and hide another element via class changes:

`.collapse` hides content

`.collapsing` is applied during transitions

`.collapse.show` shows content

Generally, we recommend using a button with the `data-target` attribute. While not recommended from a semantic point of view, you can also use a link with the `href` attribute (and a `role="button"`). In both cases, the `data-toggle="collapse"` is required.



#Code

```
<p>
```

```
<a class="btn btn-primary" data-toggle="collapse" href="#collapseExample" role="button" aria-expanded="false" aria-controls="collapseExample">
```

```
  Link with href
```

```
</a>
```



```
<button class="btn btn-primary" type="button" data-toggle="collapse" data-
target="#collapseExample" aria-expanded="false" aria-controls="collapseExample">
```

Button with data-target

```
</button>
```

```
</p>
```

```
<div class="collapse" id="collapseExample">
```

```
<div class="card card-body">
```

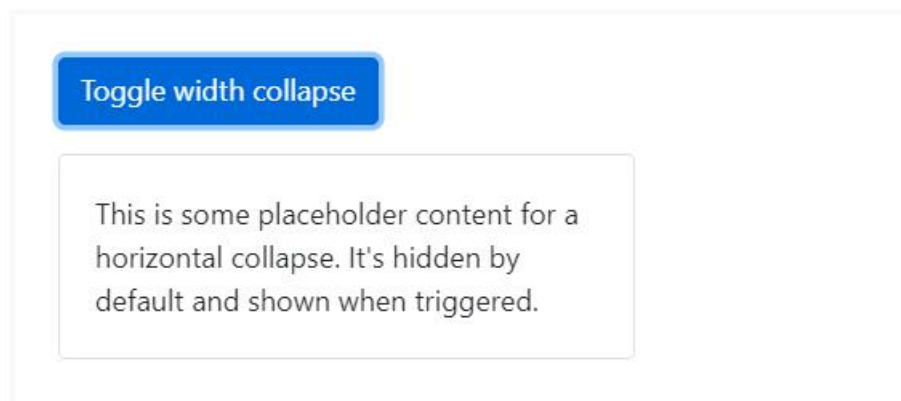
Some placeholder content for the collapse component. This panel is hidden by default but revealed when the user activates the relevant trigger.

```
</div>
```

```
</div>
```

Horizontal

The collapse plugin also supports horizontal collapsing. Add the `.width` modifier class to transition the width instead of height and set a width on the immediate child element. Feel free to write your own custom Sass, use inline styles, or use our width utilities.



#Code

```
<p>
```

```
<button class="btn btn-primary" type="button" data-toggle="collapse" data-
target="#collapseWidthExample" aria-expanded="false" aria-controls="collapseWidthExample">
```

Toggle width collapse

```
</button>
```

```
</p>
```

```
<div style="min-height: 120px;">
```

```
<div class="collapse width" id="collapseWidthExample">
```

```
<div class="card card-body" style="width: 320px;">
```

This is some placeholder content for a horizontal collapse. It's hidden by default and shown when triggered.

```
</div>
```

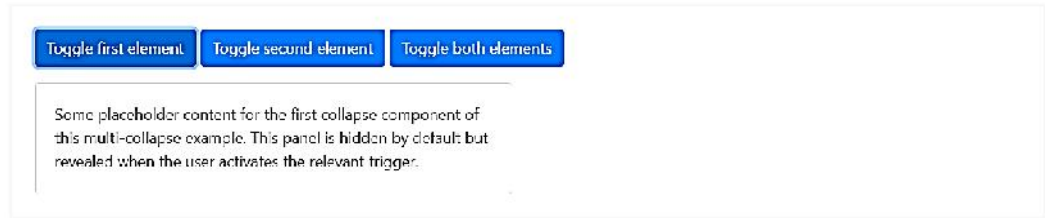
```
</div>
```

```
</div>
```

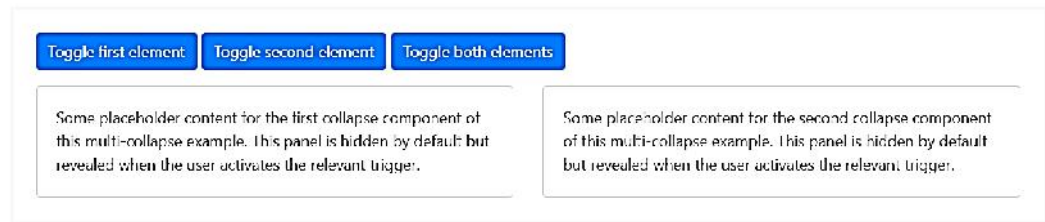

Multiple targets

A <button> or <a> can show and hide multiple elements by referencing them with a JQuery selector in its href or data-target attribute. Multiple <button> or <a> can show and hide an element if they each reference it with their href or data-target attribute.

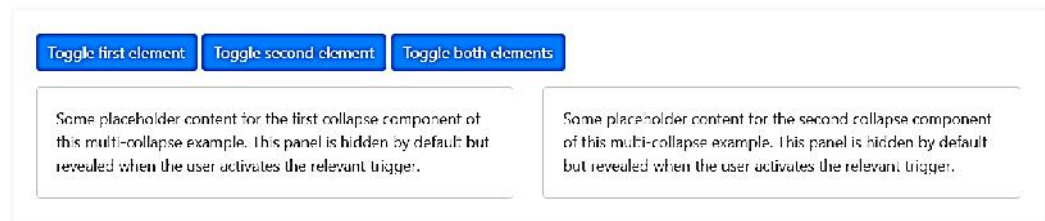
Toggle First Element Using button 1



Toggle second Element Using button 2



Toggle Both Element Using button 1



#Code

```
<p>
```

```
<a class="btn btn-primary" data-toggle="collapse" href="#multiCollapseExample1" role="button"
aria-expanded="false" aria-controls="multiCollapseExample1">Toggle first element</a>
```

```
<button class="btn btn-primary" type="button" data-toggle="collapse" data-
target="#multiCollapseExample2" aria-expanded="false" aria-
controls="multiCollapseExample2">Toggle second element</button>
```

```
<button class="btn btn-primary" type="button" data-toggle="collapse" data-target=".multi-collapse"
aria-expanded="false" aria-controls="multiCollapseExample1 multiCollapseExample2">Toggle
both elements</button>
```

```
</p>
```

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



```
<div class="col">
<div class="collapse multi-collapse" id="multiCollapseExample1">
<div class="card card-body">
```

Some placeholder content for the first collapse component of this multi-collapse example. This panel is hidden by default but revealed when the user activates the relevant trigger.

```
</div>
</div>
</div>
<div class="col">
<div class="collapse multi-collapse" id="multiCollapseExample2">
<div class="card card-body">
```

Some placeholder content for the second collapse component of this multi-collapse example. This panel is hidden by default but revealed when the user activates the relevant trigger.

```
</div>
</div>
</div>
</div>
```

10.2 The Accordion

The accordion is a frequently used element that offers many design frameworks. Technically, this is a group of navigation elements and dynamic panels, which are displayed exclusively in each case. The individual components have all been introduced. In Bootstrap the accordion is not a stand-alone component, but a combination of basic building blocks.

```
<div id="accordion" role="tablist" aria-multiselectable="true">
<div class="card card-success" role="tab">
<h4 class="card-header" id="headingOne">
<a href="#collapseOne" data-toggle="collapse" data-parent="#accordion" aria-expanded="true" aria-controls="collapseOne">
Group 1</a>
</h4>
<div id="collapseOne" class="collapse in" role="tabpanel" aria-labelledby="headingOne">
<div class="card-block card-text">
A lot of text in group 1.
</div>
</div>
</div>
<div class="card" role="tab">
<h4 class="card-header" id="headingTwo">
<a href="#collapseTwo" data-toggle="collapse" data-parent="#accordion" aria-expanded="false" aria-controls="collapseTwo">Group 2</a>
</h4>
<div id="collapseTwo" class="collapse" role="tabpanel" aria-labelledby="headingTwo">
```



```

<div class="card-block card-text">
A lot of text in group 2.
</div>
</div>
</div>
<div class="card"
role="tab">
<h4 class="card-header"
id="headingThree">
<a href="#collapseThree"
data-toggle="collapse"
data-parent="#accordion"
aria-expanded="false"
aria-controls="collapseThree">
Group 3</a>
</h4>
<div id="collapseThree" class="collapse" role="tabpanel" aria-labelledby="headingThree">
<div class="card-block card-text">
A lot of text in group 3.
</div>
</div>
</div>
</div>

```

The code uses the data attributes and design of the in Bootstrap 4 newly introduced `.card` class. The trigger for the switching of the group is `data-toggle="collapse"`. This can either be a link (with `href="#targetId"`) or a button (with `data-target="Selector"`). So when you open a group, the group that is already open closes automatically, which is `data-parent="id"` and uses the ID that refers to the surrounding container element.

Output



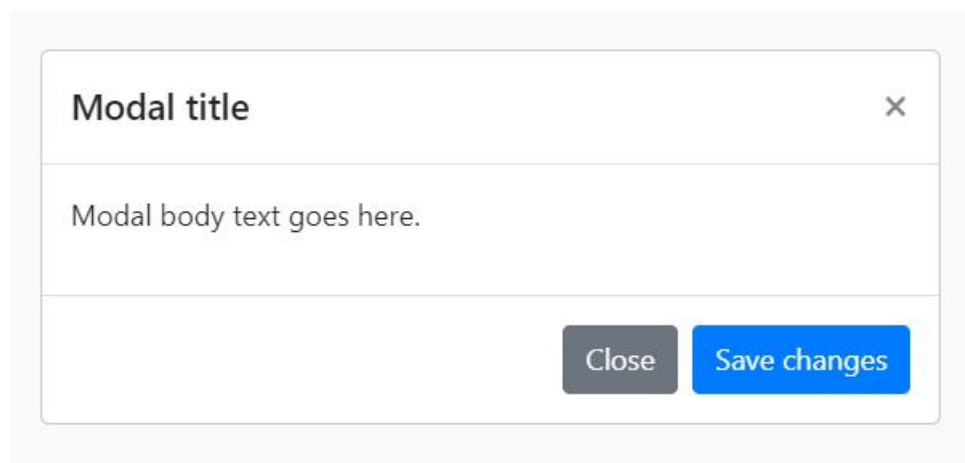
10.3 The Modal

- Modals are built with HTML, CSS, and JavaScript. They're positioned over everything else in the document and remove scroll from the <body> so that modal content scrolls instead.
- Clicking on the modal "backdrop" will automatically close the modal.
- Bootstrap only supports one modal window at a time. Nested modals aren't supported as we believe them to be poor user experiences.
- Modals use position: fixed, which can sometimes be a bit particular about its rendering. Whenever possible, place your modal HTML in a top-level position to avoid potential interference from other elements. You'll likely run into issues when nesting a .modal within another fixed element.
- Once again, due to position: fixed, there are some caveats with using modals on mobile devices. See our browser support docs for details.
- Due to how HTML5 defines its semantics, the autofocus HTML attribute has no effect in Bootstrap modals. To achieve the same effect, use some custom JavaScript:

```
$('#myModal').on('shown.bs.modal', function () {  
    $('#myInput').trigger('focus')  
})
```

Model Components

Below is a static modal example (meaning its position and display have been overridden). Included are the modal header, modal body (required for padding), and modal footer (optional). We ask that you include modal headers with dismiss actions whenever possible, or provide another explicit dismiss action.



#Code

```
<div class="modal" tabindex="-1">  
<div class="modal-dialog">  
<div class="modal-content">  
<div class="modal-header">
```



```

<h5 class="modal-title">Modal title</h5>
<button type="button" class="close" data-dismiss="modal" aria-label="Close">
<span aria-hidden="true">&times;</span>
</button>
</div>
<div class="modal-body">
<p>Modal body text goes here.</p>
</div>
<div class="modal-footer">
<button type="button" class="btn btn-secondary" data-dismiss="modal">Close</button>
<button type="button" class="btn btn-primary">Save changes</button>
</div>
</div>
</div>
</div>

```

Toggle a working modal demo by clicking the button below. It will slide down and fade in from the top of the page.



#Code

```

<!-- Button trigger modal -->
<button type="button" class="btn btn-primary" data-toggle="modal" data-
target="#exampleModal">
  Launch demo modal
</button>

<!-- Modal -->
<div class="modal fade" id="exampleModal" tabindex="-1" aria-labelledby="exampleModalLabel"
aria-hidden="true">
<div class="modal-dialog">
<div class="modal-content">
<div class="modal-header">
<h5 class="modal-title" id="exampleModalLabel">Modal title</h5>
<button type="button" class="close" data-dismiss="modal" aria-label="Close">
<span aria-hidden="true">&times;</span>
</button>
</div>
<div class="modal-body">

```



```
...
</div>
<div class="modal-footer">
<button type="button" class="btn btn-secondary" data-dismiss="modal">Close</button>
<button type="button" class="btn btn-primary">Save changes</button>
</div>
</div>
</div>
</div>
```

Flush in Accordion

The `.accordion-flush` class is used within the `.accordion` class to remove some default background colors, borders, and some rounded corners. It just fills the spaces to make it more representative for real-world applications. Let's see an example.

Summary

- Bootstrap only supports one modal window at a time. Nested modals aren't supported as we believe them to be poor user experiences.
- Modals use `position: fixed`, which can sometimes be a bit particular about its rendering. Whenever possible, place your modal HTML in a top-level position to avoid potential interference from other elements. You'll likely run into issues when nesting a `.modal` within another fixed element.
- A modal (also called a modal window or lightbox) is a web page element that displays in front of and deactivates all other page content.
- Collapsible panels provide users with the ability to expand and collapse content as needed. They can simplify the interface by hiding content until it is needed.

Keywords

Modal: A modal (also called a modal window or lightbox) is a web page element that displays in front of and deactivates all other page content. To return to the main content, the user must engage with the modal by completing an action or by closing it.

Accordion: In web design, an accordion is a type of menu that displays a list of headers stacked on top of one another. When clicked on (or triggered by a keyboard interaction or screen reader), these headers will either reveal or hide associated content.

SelfAssessment

1. Which of the following plugin in Bootstrap is used to create a modal window?
 - A. popup
 - B. alert
 - C. modal

- D. window
2. Which of the followings are part of content insertion in bootstrap 4?
- A. Modal
 - B. Collapse
 - C. Accordion
 - D. All of above
3. _____ is applied during transitions.
- A. .collapsing
 - B. .collapse
 - C. .main
 - D. None of above
4. A _____ is a web page element that displays in front of and deactivates all other page content.
- A. Modal
 - B. Container
 - C. Image
 - D. Button
5. An _____ is a type of menu that displays a list of headers stacked on top of one another.
- A. Label
 - B. Collapse
 - C. Button
 - D. Accordion
6. To properly achieve the accordion style, be sure to use _____ as a wrapper.
- A. .accordion
 - B. .wrap
 - C. .card
 - D. .collapse
7. Which of the following is correct about Modal Plugin?
- A. You can toggle the modal plugin's hidden content via data attributes.
 - B. You can toggle the modal plugin's hidden content via javascript.
 - C. Both of the above.
 - D. None of the above.
8. Bootstrap package includes?
- A. Scaffolding

- B. Components
- C. JavaScript Plugins
- D. All of the above

9. Can we use collapse for contents in bootstrap?

- A. True
- B. False

10. Bootstrap _____ is used to show or hide content.

- A. Button
- B. Link
- C. Modal
- D. Collapse

11. _____ Indicates which group is open, while using collapse.

- A. aria-expanded:
- B. aria-controls:
- C. All of above
- D. None of above

12. The .accordion-flush class is used within the .accordion class to remove some default background colors, borders, and rounded corners.

- A. True
- B. False

13. Collapse can be multiply targeted.

- A. Yes
- B. No

14. A modal dialog is exclusive, so only one dialog at a time can be open.

- A. True
- B. False

15. Which of the following cannot be created using bootstrap?

- A. Modal
- B. Accordion
- C. All of above
- D. None of above

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 2. D | 3. A | 4. A | 5. D |
| 6. A | 7. C | 8. D | 9. A | 10. D |
| 11. A | 12. A | 13. A | 14. A | 15. C |

Review Questions

1. Explain different applications of bootstrap accordions.
2. Why modals are different from accordions?
3. Write a code that demonstrates the working of modal.
4. Write a code that demonstrates the working of collapse?
5. Why we need collapse in website? Comment.

**Further Readings**

Bootstrap by Example, Silvio Morato

Learning Bootstrap 4, Matt Lambert

Bootstrap in 24 Hours, By Sams

Jump Start Bootstrap,

**Web Links**

<https://getbootstrap.com/docs/4.0/getting-started/introduction/>

Unit 11: Tooltips

CONTENTS

Objectives

Introduction

11.1 Overview

11.2 Implementation of tooltip

11.3 Options

11.4 Event

11.5 Popover Plugin

11.6 Carousel

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

- After studying this unit, you will be able to:
- Understand concept of bootstrap tooltip.
- Create the Tooltips with Bootstrap.
- Understand Documentation and examples for adding Bootstrap popovers.
- show a collection of items one at a time using Carousels.

Introduction

The Tooltip plugin is small pop-up box that appears when the user moves the mouse pointer over an element:

Hover over me



Tooltips can be very helpful for the new visitors of your website because they enable the user to know the purpose of icons and links by placing the mouse pointer over them.

11.1 Overview

Tooltips rely on the 3rd party library Popper.js for positioning. You must include popper.min.js before bootstrap.js or use bootstrap.bundle.min.js / bootstrap.bundle.js which contains Popper.js in order for tooltips to work!

If you're building our JavaScript from source, it requires util.js.

Tooltips are opt-in for performance reasons, so you must initialize them yourself.

Tooltips with zero-length titles are never displayed.

Specify container: 'body' to avoid rendering problems in more complex components (like our input groups, button groups, etc).

Triggering tooltips on hidden elements will not work.

Tooltips for .disabled or disabled elements must be triggered on a wrapper element.

When triggered from hyperlinks that span multiple lines, tooltips will be centered. Use white-space: nowrap; on your <a>s to avoid this behavior.

Tooltips must be hidden before their corresponding elements have been removed from the DOM.

11.2 Implementation of tooltip

Step 1: Adding the Tooltip Markup

To create a tooltip, you need to add the data-bs-toggle="tooltip" attribute to an element. Tooltip text that would display on hover can be specified using the title attribute.

Here is the standard markup for adding a tooltip to a hyperlink.

```
<a href="#" data-bs-toggle="tooltip" title="Some text">Hover over me</a>
```

Similarly, you can add tooltips to the other elements such as buttons, icons, etc.

Step 2: Enabling the Tooltips

Tooltips can be enabled via JavaScript — just call the tooltip() Bootstrap method with the id, class or any CSS selector of the target element in your JavaScript code.

Example: Enable tooltips everywhere

One way to initialize all tooltips on a page would be to select them by their data-toggle attribute:

```
$(function () {  
  $('[data-toggle="tooltip"]').tooltip()  
})
```

We can even customize this tool-tip according to our requirement, let's explore different ways in which we can customize the tool-tip.

Placement of a tool tip : We can place a tool tip at top, bottom, left and right of an element.

Example:

Code for the above example:

- HTML

```

<!-- Tooltips on simple buttons -->
<!-- Placement of tooltips -->
<div class="row" style="margin:30px">
  <div class="col-2">
    <button type="button" class="btn btn-info"
      data-toggle="tooltip" data-placement="top"
      title="Information Button">
      Information
    </button>
  </div>
  <div class="col-2">
    <button type="button" class="btn btn-success"
      data-toggle="tooltip" data-placement="right"
      title="Success Button">
      Success
    </button>
  </div>
  <div class="col-2">
    <button type="button" class="btn btn-danger"
      data-toggle="tooltip" data-placement="bottom"
      title="Danger button">
      Danger
    </button>
  </div>
  <div class="col-2">
    <button type="button" class="btn btn-warning"
      data-toggle="tooltip" data-placement="left"
      title="Warning button">
      Warning
    </button>
  </div>
</div>

```



```
</div>
```

In the above code we have used the data-placement attribute in order to set the placement of tooltip, we have also used row and col classes provided by bootstrap grid system

Html within a tooltip: We can add html as a content of a tooltip.

Example:



Code for the above example:

```
<!-- Tooltip with html -->
<div class="row" style="margin:40px">
  <button type="button" class="btn btn-warning"
    data-toggle="tooltip" data-placement="left"
    data-html="true" title=
      "<h4>Hey!</h4>"
  <p>Tooltip with html</p>
">
  Warning
</button>
</div>
```

In the above code we have used the data-html attribute in order to add an html within a tooltip.

Offset for a Tooltip: We can set the offset of the tooltip relative to the target.

11.3 Options

Options can be passed via data attributes or JavaScript. For data attributes, append the option name to **data-**, as in **data-animation=""**.

Name	Type	Default	Description
animation	boolean	true	Apply a CSS fade transition to the tooltip
container	string element false	false	Appends the tooltip to a specific element. Example: container: 'body' . This option is particularly useful in that it allows you to position the tooltip in the flow of the document near the triggering element - which will prevent the tooltip from floating away from the triggering element during a window resize.
delay	number object	0	Delay showing and hiding the tooltip (ms) - does not apply to manual trigger type

Unit11: Tooltips

Name	Type	Default	Description
			<p>If a number is supplied, delay is applied to both hide/show</p> <p>Object structure is: <code>delay: { "show": 500, "hide": 100 }</code></p>
html	boolean	false	<p>Allow HTML in the tooltip.</p> <p>If true, HTML tags in the tooltip's title will be rendered in the tooltip. If false, jQuery's text method will be used to insert content into the DOM.</p> <p>Use text if you're worried about XSS attacks.</p>
placement	string function	'top'	<p>How to position the tooltip - auto top bottom left right.</p> <p>When auto is specified, it will dynamically reorient the tooltip.</p> <p>When a function is used to determine the placement, it is called with the tooltip DOM node as its first argument and the triggering element DOM node as its second. The this context is set to the tooltip instance.</p>
selector	string false	false	<p>If a selector is provided, tooltip objects will be delegated to the specified targets. In practice, this is used to enable dynamic HTML content to have popovers added. See this and an informative example.</p>
template	string	'<div class="tooltip" role="tooltip"><div class="arrow"></div><div class="tooltip-inner"></div></div>'	<p>Base HTML to use when creating the tooltip.</p> <p>The tooltip's title will be injected into the .tooltip-inner.</p> <p>.arrow will become the tooltip's arrow.</p> <p>The outermost wrapper element should have the .tooltip class and role="tooltip".</p>
title	string element function	"	<p>Default title value if title attribute isn't <i>present</i>.</p> <p>If a function is given, it will be called with its this reference set to the element that the tooltip is attached to.</p>
trigger	string	'hover focus'	<p>How tooltip is triggered - click hover focus manual. You may pass multiple triggers; separate them with a space.</p> <p>'manual' indicates that the tooltip will be triggered programmatically via the .tooltip('show'), .tooltip('hide') and .tooltip('toggle') methods; this value cannot be combined with any other trigger.</p> <p>'hover' on its own will result in tooltips that cannot be triggered via the keyboard, and should only be used if alternative methods for conveying the same information for keyboard users is present.</p>

Name	Type	Default	Description
offset	number string	0	Offset of the tooltip relative to its target. For more information refer to Popper.js's offset docs .
fallbackPlacement	string array	'flip'	Allow to specify which position Popper will use on fallback. For more information refer to Popper.js's behavior docs
boundary	string element	'scrollParent'	Overflow constraint boundary of the tooltip. Accepts the values of 'viewport', 'window', 'scrollParent', or an HTMLElement reference (JavaScript only). For more information refer to Popper.js's preventOverflow docs .

11.4 Event

Event Type	Description
show.bs.tooltip	This event fires immediately when the show instance method is called.
shown.bs.tooltip	This event is fired when the tooltip has been made visible to the user (will wait for CSS transitions to complete).
hide.bs.tooltip	This event is fired immediately when the hide instance method has been called.
hidden.bs.tooltip	This event is fired when the tooltip has finished being hidden from the user (will wait for CSS transitions to complete).
inserted.bs.tooltip	This event is fired after the show.bs.tooltip event when the tooltip template has been added to the DOM.

11.5 Popover Plugin

Things to know when using the popover plugin:

Popovers rely on the 3rd party library Popper.js for positioning. You must include popper.min.js before bootstrap.js or use bootstrap.bundle.min.js / bootstrap.bundle.js which contains Popper.js in order for popovers to work!

Popovers require the tooltip plugin as a dependency.

If you're building our JavaScript from source, it requires util.js.

Popovers are opt-in for performance reasons, so you must initialize them yourself.

Zero-length title and content values will never show a popover.

Specify container: 'body' to avoid rendering problems in more complex components (like our input groups, button groups, etc).

Triggering popovers on hidden elements will not work.

Popovers for .disabled or disabled elements must be triggered on a wrapper element.

When triggered from anchors that wrap across multiple lines, popovers will be centered between the anchors' overall width. Use white-space: nowrap; on your <a>s to avoid this behavior.

Popovers must be hidden before their corresponding elements have been removed from the DOM.

Keep reading to see how popovers work with some examples.

Example: Enable popovers everywhere

One way to initialize all popovers on a page would be to select them by their data-toggle attribute:

Copy

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

Example: Using the container option

When you have some styles on a parent element that interfere with a popover, you'll want to specify a custom container so that the popover's HTML appears within that element instead.

Copy

```
$(function () {
  $('.example-popover').popover({
    container: 'body'
  })
})
```

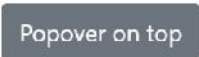
Example




```
<button type="button" class="btn btn-lg btn-danger" data-toggle="popover" title="Popover title" data-content="And here's some amazing content. It's very engaging. Right?">Click to toggle popover</button>
```

Four directions

Four options are available: top, right, bottom, and left aligned.






```
<button type="button" class="btn btn-secondary" data-container="body" data-toggle="popover" data-placement="top" data-content="Vivamus sagittis lacus vel augue laoreet rutrum faucibus.">
  Popover on top
</button>
```



```
<button type="button" class="btn btn-secondary" data-container="body" data-toggle="popover" data-placement="right" data-content="Vivamus sagittis lacus vel augue laoreet rutrum faucibus.">
  Popover on right
</button>
```

```
<button type="button" class="btn btn-secondary" data-container="body" data-toggle="popover" data-placement="bottom" data-content="Vivamus sagittis lacus vel augue laoreet rutrum faucibus.">
  Popover on bottom
</button>
```

```
<button type="button" class="btn btn-secondary" data-container="body" data-toggle="popover" data-placement="left" data-content="Vivamus sagittis lacus vel augue laoreet rutrum faucibus.">
  Popover on left
</button>
```

Events

Event Type	Description
show.bs.popover	This event fires immediately when the show instance method is called.
shown.bs.popover	This event is fired when the popover has been made visible to the user (will wait for CSS transitions to complete).
hide.bs.popover	This event is fired immediately when the hide instance method has been called.
hidden.bs.popover	This event is fired when the popover has finished being hidden from the user (will wait for CSS transitions to complete).
inserted.bs.popover	This event is fired after the show.bs.popover event when the popover template has been added to the DOM.

11.6 Carousel

A slideshow component for cycling through elements—images or slides of text—like a carousel.

How it works

The carousel is a slideshow for cycling through a series of content, built with CSS 3D transforms and a bit of JavaScript. It works with a series of images, text, or custom markup. It also includes support for previous/next controls and indicators.

In browsers where the Page Visibility API is supported, the carousel will avoid sliding when the webpage is not visible to the user (such as when the browser tab is inactive, the browser window is minimized, etc.).

Please be aware that nested carousels are not supported, and carousels are generally not compliant with accessibility standards.

Lastly, if you're building our JavaScript from source, it requires `util.js`.

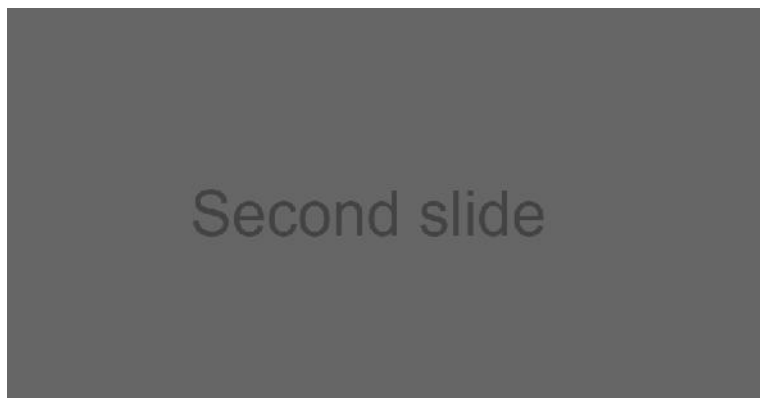
Example

Carousels don't automatically normalize slide dimensions. As such, you may need to use additional utilities or custom styles to appropriately size content. While carousels support previous/next controls and indicators, they're not explicitly required. Add and customize as you see fit.

Be sure to set a unique id on the .carousel for optional controls, especially if you're using multiple carousels on a single page.

Slides only

Here's a carousel with slides only. Note the presence of the .d-block and .img-fluid on carousel images to prevent browser default image alignment.



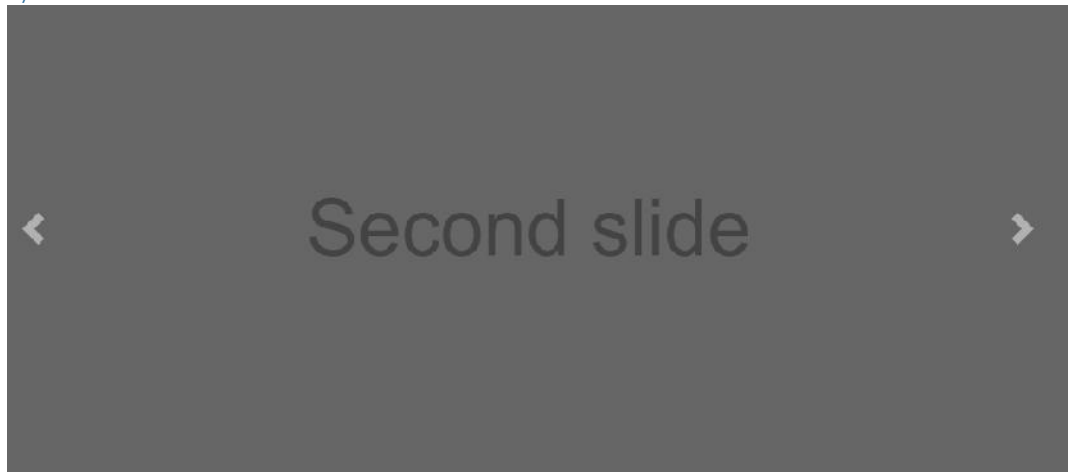
With controls

Adding in the previous and next controls:

```
<div id="carouselExampleSlidesOnly" class="carousel slide" data-ride="carousel">
  <div class="carousel-inner">
    <div class="carousel-item active">
      
    </div>
    <div class="carousel-item">
      
    </div>
    <div class="carousel-item">
      
    </div>
  </div>
```



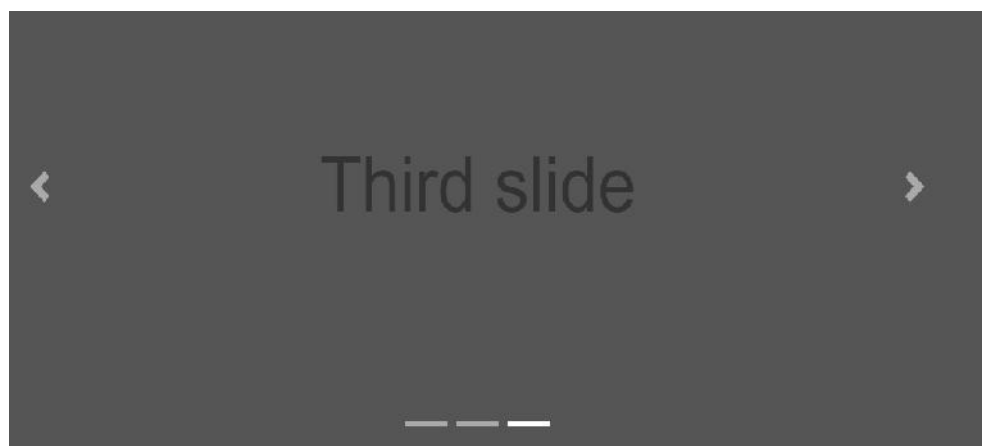
```
</div>
```



```
<div id="carouselExampleControls" class="carousel slide" data-ride="carousel">
  <div class="carousel-inner">
    <div class="carousel-item active">
      
    </div>
    <div class="carousel-item">
      
    </div>
    <div class="carousel-item">
      
    </div>
  </div>
  <a class="carousel-control-prev" href="#carouselExampleControls" role="button" data-slide="prev">
    <span class="carousel-control-prev-icon" aria-hidden="true"></span>
    <span class="sr-only">Previous</span>
  </a>
  <a class="carousel-control-next" href="#carouselExampleControls" role="button" data-slide="next">
    <span class="carousel-control-next-icon" aria-hidden="true"></span>
    <span class="sr-only">Next</span>
  </a>
</div>
```

With indicators

You can also add the indicators to the carousel, alongside the controls, too.




```

2. <divid="carouselExampleIndicators" class="carousel slide" data-ride="carousel">
3. <ol class="carousel-indicators">
4. <li data-target="#carouselExampleIndicators" data-slide-to="0" class="active"></li>
5. <li data-target="#carouselExampleIndicators" data-slide-to="1"></li>
6. <li data-target="#carouselExampleIndicators" data-slide-to="2"></li>
7. </ol>
8. <div class="carousel-inner">
9. <div class="carousel-item active">
10. 
11. </div>
12. <div class="carousel-item">
13. 
14. </div>
15. <div class="carousel-item">
16. 
17. </div>
18. </div>
19. <a class="carousel-control-prev" href="#carouselExampleIndicators" role="button" data-
  slide="prev">
20. <span class="carousel-control-prev-icon" aria-hidden="true"></span>
21. <span class="sr-only">Previous</span>
22. </a>
23. <a class="carousel-control-next" href="#carouselExampleIndicators" role="button" data-
  slide="next">
24. <span class="carousel-control-next-icon" aria-hidden="true"></span>
25. <span class="sr-only">Next</span>
26. </a>
27. </div>

```

With captions

Add captions to your slides easily with the `.carousel-caption` element within any `.carousel-item`. They can be easily hidden on smaller viewports, as shown below, with optional display utilities. We hide them initially with `.d-none` and bring them back on medium-sized devices with `.d-md-block`.



```

<div class="carousel-item">
  
  <div class="carousel-caption d-none d-md-block">
    <h5>...</h5>
    <p>...</p>
  </div>
</div>

```


Events

Bootstrap's carousel class exposes two events for hooking into carousel functionality. Both events have the following additional properties:

- **direction**: The direction in which the carousel is sliding (either "left" or "right").
- **relatedTarget**: The DOM element that is being slid into place as the active item.
- **from**: The index of the current item
- **to**: The index of the next item

All carousel events are fired at the carousel itself (i.e. at the `<div class="carousel">`)

Summary

- Tooltips are useful when you need to describe a link. Tooltip will display a small pop-up box, when you hover the mouse on an element.
- You can add tooltip to an element by adding `data-toggle = "tooltip"` attribute to it. The `title` attribute indicates the text of a tooltip.
- Tooltips with zero-length titles are never displayed.
- Specify container: 'body' to avoid rendering problems in more complex components (like our input groups, button groups, etc).
- Triggering tooltips on hidden elements will not work.
- Tooltip can be displayed in four directions such as top, bottom, left or right side by using the data-placement attribute on the element.

Keywords

- Tooltips rely on the 3rd party library Popper.js for positioning. You must include popper.min.js before bootstrap.js or use bootstrap.bundle.min.js / bootstrap.bundle.js which contains Popper.js in order for tooltips to work!
- If you're building our JavaScript from source, it requires util.js.
- Tooltips are opt-in for performance reasons, so you must initialize them yourself.
- Tooltips with zero-length titles are never displayed.
- Specify container: 'body' to avoid rendering problems in more complex components (like our input groups, button groups, etc).

SelfAssessment

1) Who developed the bootstrap?

- A. James Gosling
- B. Mark Jukervich
- C. Dennis Ritchie
- D. Mark Otto and Jacob Thornton

2) Is Bootstrap3 mobile-first?

- A. True
- B. False
- C. Can't say
- D. May be

- 3) Which of the following class in Bootstrap is used to provide a responsive fixed width container?
- A. .container-fixed
 - B. .container-fluid
 - C. .container
 - D. All of the above
- 4) How many columns are allowed in a bootstrap grid system?
- A. 2
 - B. 12
 - C. 3
 - D. 5
- 5) Which of the following class in bootstrap is used to create a big box for calling extra attention?
- A. .box
 - B. .container
 - C. .container-fluid
 - D. .jumbotron
- 6) Appends the tooltip to a specific element
- A. Container
 - B. Delay
 - C. Template
 - D. Title
- 7) Default title value if title attribute isn't present.
- A. Container
 - B. Delay
 - C. Template
 - D. Title
- 8) _____showing and hiding the tooltip (ms) - does not apply to manual trigger type
- A. Container
 - B. Delay
 - C. Template
 - D. Title
- 9) It is used as Base HTML to use when creating the tooltip.
- A. Container
 - B. Delay

C. Template

D. Title

10) This event fires immediately when the show instance method is called.

A. show.bs.tooltip

B. shown.bs.tooltip

C. hide.bs.tooltip

D. hidden.bs.tooltip

11) This event is fired when the tooltip has been made visible to the user (will wait for CSS transitions to complete)

A. show.bs.tooltip

B. shown.bs.tooltip

C. hide.bs.tooltip

D. hidden.bs.tooltip

12) This event is fired immediately when the hide instance method has been called

A. show.bs.tooltip

B. shown.bs.tooltip

C. hide.bs.tooltip

D. hidden.bs.tooltip

13) This event is fired when the tooltip has finished being hidden from the user (will wait for CSS transitions to complete).

A. show.bs.tooltip

B. shown.bs.tooltip

C. hide.bs.tooltip

D. hidden.bs.tooltip

14) This event is fired after the show.bs.tooltip event when the tooltip template has been added to the DOM.

A. show.bs.tooltip

B. shown.bs.tooltip

C. hide.bs.tooltip

D. inserted.bs.tooltip

15 Allow to specify which position Popper will use on fallback

A. Fallback Placement

B. Delay

C. Template

D. Title

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| L. D | 2. A | 3. C | 4. B | 5. D |
| 6. A | 7. D | 8. B | 9. C | 10. A |
| 11. B | 12. C | 13. D | 14. D | 15. A |

Review Questions

1. How To Create and Use Tooltips?
2. Explain Bootstrap Tooltip Positions with example of implementing it?
3. What are various ways to pass options using data attributes and via JavaScript?
4. Where do you position tooltips?
5. How to change the tooltip position in Bootstrap?
6. What are Things to know when using the tooltip plugin?

**Further Readings**

- Bootstrap by Example, Silvio Morato
- Learning Bootstrap 4, Matt Lambert
- Bootstrap in 24 Hours, By Sams
- Jump Start Bootstrap,

**Web Links**

<https://api.jquery.com/category/events/>

<https://api.jquery.com>

Unit 12: JQuery

CONTENTS

Objectives

Introduction

12.1 JQuery

12.2 jQuery Selectors

12.3 Event Handling

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand JQuery
- Design structure of the elements on a web page
- Custom jQuery extensions to the standard set of CSS selectors
- The DOM traversal methods, which provide greater flexibility for accessing elements on the page

Introduction

The purpose of jQuery is to make it much easier to use JavaScript on your website. jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code. jQuery is a small, light-weight and fast JavaScript library. It is cross-platform and supports different types of browsers. It is also referred as 'write less do more' because it takes a lot of common tasks that requires many lines of JavaScript code to accomplish, and binds them into methods that can be called with a single line of code whenever needed. It is also very useful to simplify a lot of the complicated things from JavaScript, like AJAX calls and DOM manipulation.

12.1 JQuery

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

What jQuery does

The jQuery library provides a general-purpose abstraction layer for common webscripting, and is therefore useful in almost every scripting situation. Its extensible nature means that we could never cover all the possible uses and functions in a single book, as plugins are constantly being developed to add new abilities. The core features, though, assist us in accomplishing the following tasks:

- Access elements in a document: Without a JavaScript library, web developers often need to write many lines of code to traverse the Document Object Model (DOM) tree and locate specific portions of an HTML document's structure. With jQuery, developers have a robust and efficient selector mechanism at their disposal, making it easy to retrieve the exact piece of the document that needs to be inspected or manipulated.

```
$('#div.content').find('p');
```

- Modify the appearance of a web page: CSS offers a powerful method of influencing the way a document is rendered, but it falls short when not all web browsers support the same standards. With jQuery, developers can bridge this gap, relying on the same standards support across all browsers. In addition, jQuery can change the classes or individual style properties applied to a portion of the document even after the page has been rendered.

```
$('#ul>li:first').addClass('active');
```

- Alter the content of a document: Not limited to mere cosmetic changes, jQuery can modify the content of a document itself with a few keystrokes. Text can be changed, images can be inserted or swapped, lists can be reordered, or the entire structure of the HTML can be rewritten and extended — all with a single easy-to-use Application Programming Interface (API).

```
$('#container').append('<a href="more.html">more</a>');
```

- Respond to a user's interaction: Even the most elaborate and powerful behaviors are not useful if we can't control when they take place. The jQuery library offers an elegant way to intercept a wide variety of events, such as a user clicking on a link, without the need to clutter the HTML code itself with event handlers. At the same time, its event-handling API removes browser inconsistencies that often plague web developers.

```
$('#button.show-details').click(function() {
    $('#div.details').show();
});
```

Animate changes being made to a document: To effectively implement such interactive behaviors, a designer must also provide visual feedback to the user. The jQuery library facilitates this by providing an array of effects such as fades and wipes, as well as a toolkit for crafting new ones.

```
$('#div.details').slideDown();
```

- Retrieve information from a server without refreshing a page: This code pattern is known as Ajax, which originally stood for Asynchronous JavaScript and XML, but has since come to represent a much greater set of technologies for communicating between the client and the server. The jQuery library removes the browser-specific complexity from this responsive, feature-rich process, allowing developers to focus on the server-end functionality.

```
$('#div.details').load('more.html #content');
```

- Simplify common JavaScript tasks: In addition to all of the document-specific features of jQuery, the library provides enhancements to basic JavaScript constructs such as iteration and array manipulation.

```
$.each(obj, function(key, value) {
    total += value;
});
```

Why jQuery works well

With the resurgence of interest in dynamic HTML comes a proliferation of JavaScript frameworks. Some are specialized, focusing on just one or two of the tasks previously mentioned. Others attempt to catalog every possible behavior and animation and serve these all up prepackaged. To maintain the wide range of features outlined earlier while remaining relatively compact, jQuery employs several strategies:

- Leverage knowledge of CSS: By basing the mechanism for locating page elements on CSS selectors, jQuery inherits a terse yet legible way of expressing a document's structure. The jQuery library becomes an entry point for designers who want to add behaviors to their pages, because a prerequisite for doing professional web development is knowledge of CSS syntax.

- Support extensions: In order to avoid "feature creep", jQuery relegates special-case uses to plugins. The method for creating new plugins is simple and well-documented, which has spurred the development of a wide variety of inventive and useful modules. Even most of the features in the basic jQuery download are internally realized through the plugin architecture, and can be removed if desired, yielding an even smaller library.

Abstract away browser quirks: An unfortunate reality of web development is that each browser has its own set of deviations from published standards. A significant portion of any web application can be relegated to handling features differently on each platform. While the ever-evolving browser landscape makes a perfectly browser-neutral code base impossible for some advanced features, jQuery adds an abstraction layer that normalizes the common tasks, reducing the size of code while tremendously simplifying it.

- Always work with sets: When we instruct jQuery to find all elements with the class collapsible and hide them, there is no need to loop through each returned element. Instead, methods such as `.hide()` are designed to automatically work on sets of objects instead of individual ones. This technique, called implicit iteration, means that many looping constructs become unnecessary, shortening code considerably.

- Allow multiple actions in one line: To avoid overuse of temporary variables or wasteful repetition, jQuery employs a programming pattern called chaining for the majority of its methods. This means that the result of most operations on an object is the object itself, ready for the next action to be applied to it. These strategies keep the file size of the jQuery package small, while at the same time providing techniques for keeping our custom code that uses the library compact as well.

The elegance of the library comes about partly by design and partly due to the evolutionary process spurred by the vibrant community that has sprung up around the project. Users of jQuery gather to discuss not only the development of plugins, but also enhancements to the core library. The users and developers also assist in continually improving the official project documentation, which can be found at <http://api.jquery.com>.

Despite all the efforts required to engineer such a flexible and robust system, the end product is free for all to use. This open source project is licensed under the MIT License to permit free use of jQuery on any site and facilitate its use within proprietary software. If a project requires it, developers can relicense jQuery under the GNU Public License for inclusion in other GNU-licensed open source projects.

12.2 jQuery Selectors

Understanding the DOM

One of the most powerful aspects of jQuery is its ability to make selecting elements in the DOM easy. The DOM serves as the interface between JavaScript and a web page; it provides a representation of the source HTML as a network of objects rather than as plain text.

This network takes the form of a family tree of elements on the page. When we refer to the relationships that elements have with one another, we use the same terminology that we use when referring to family relationships: parents, children, and so on. A simple example can help us understand how the family tree metaphor

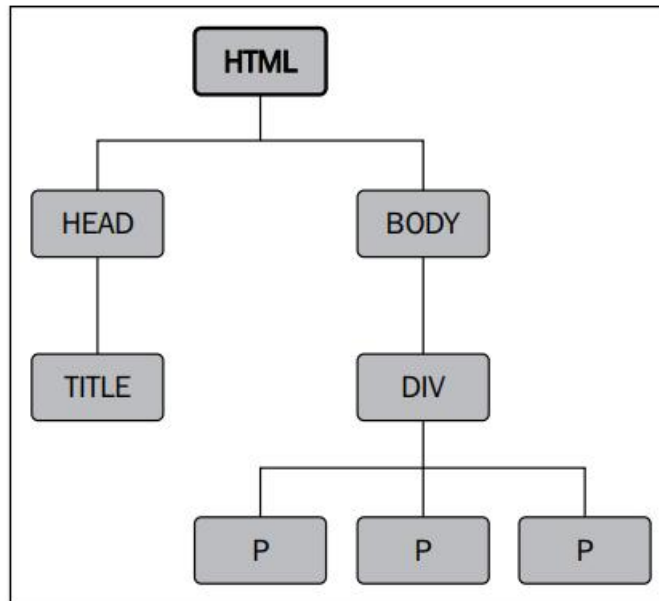
applies to a document:

```
<html>
<head>
<title>the title</title>
</head>
<body>
<div>
<p>This is a paragraph.</p>
<p>This is another paragraph.</p>
<p>This is yet another paragraph.</p>
```



```
</div>  
</body>  
</html>
```

Here, `<html>` is the ancestor of all the other elements; in other words, all the other elements are descendants of `<html>`. The `<head>` and `<body>` elements are not only descendants but children of `<html>` as well. Likewise, in addition to being the ancestor of `<head>` and `<body>`, `<html>` is also their parent. The `<p>` elements are children (and descendants) of `<div>`, descendants of `<body>` and `<html>`, and siblings of each other.



To help visualize the family tree structure of the DOM, we can use a number of software tools, such as the Firebug plugin for Firefox or the Web Inspector in Safari or Chrome.

With this tree of elements at our disposal, we'll be able to use jQuery to efficiently locate any set of elements on the page. Our tools to achieve this are jQuery selectors and traversal methods.

Using the `$()` function

The resulting set of elements from jQuery's selectors and methods is always represented by a jQuery object. Such a jQuery object is very easy to work with when we want to actually do something with the things that we find on a page.

We can easily bind events to these objects and add slick effects to them, as well as chain multiple modifications or effects together.



Notes

Note that jQuery objects are different from regular DOM elements or node lists, and as such do not necessarily provide the same methods and properties for some tasks. In the final part of this chapter, we will look at ways to directly access the DOM elements that are collected within a jQuery object.

In order to create a new jQuery object, we use the `$()` function. This function typically accepts a CSS selector as its sole parameter and serves as a factory returning a new jQuery object pointing to the corresponding elements on the page. Just about anything that can be used in a stylesheet can also be passed as a string to this function, allowing us to apply jQuery methods to the matched set of elements.

The three primary building blocks of selectors are tag name, ID, and class. They can be used either on their own or in combination with others. The following simple examples illustrate how these three selectors appear in code:

Selector type	CSS	jQuery	What it does
Tag name	<code>p { }</code>	<code>\$('p')</code>	This selects all paragraphs in the document.
ID	<code>#some-id { }</code>	<code>\$('#some-id')</code>	This selects the single element in the document that has an ID of <code>some-id</code> .
Class	<code>.some-class { }</code>	<code>\$('.some-class')</code>	This selects all elements in the document that have a class of <code>some-class</code> .

CSS selectors

The jQuery library supports nearly all the selectors included in CSS specifications¹ through 3, as outlined on the World Wide Web Consortium's site: <http://www.w3.org/Style/CSS/specs>. This support allows developers to enhance their websites without worrying about which browsers might not understand more advanced selectors, as long as the browsers have JavaScript enabled.

To begin learning how jQuery works with CSS selectors, we'll use a structure that appears on many websites, often for navigation – the nested unordered list:

```
<ul id="selected-plays">
<li>Comedies
<ul>
<li><a href="/asyoulikeit/">As You Like It</a></li>
<li>All's Well That Ends Well</li>
<li>A Midsummer Night's Dream</li>
<li>Twelfth Night</li>
</ul>
</li>
<li>Tragedies
<ul>
<li><a href="hamlet.pdf">Hamlet</a></li>
<li>Macbeth</li>
<li>Romeo and Juliet</li>
</ul>
</li>
<li>Histories
<ul>
<li>Henry IV (<a href="mailto:henryiv@king.co.uk">email</a>)
<ul>
<li>Part I</li>
<li>Part II</li>
</ul>
</li>
<li><a href="http://www.shakespeare.co.uk/henryv.htm">
Henry V</a></li>
<li>Richard II</li>
</ul>
```



```
</ul>
</li>
</ul>
```

Notice that the first `` has an ID of `selecting-plays`, but none of the `` tags have a class associated with them. Without any styles applied, the list looks like this:



The nested list appears as we would expect it to—a set of bulleted items arranged vertically and indented according to their level.

Accessing DOM elements

Every selector expression and most jQuery methods return a jQuery object. This is almost always what we want because of the implicit iteration and chaining capabilities that it affords.

Still, there may be points in our code when we need to access a DOM element directly. For example, we may need to make a resulting set of elements available to another JavaScript library, or we might need to access an element's tag name, which is available as a property of the DOM element. For these admittedly rare situations, jQuery provides the `.get()` method. To access the first DOM element referred to by a jQuery object, for example, we would use `.get(0)`. So, if we want to know the tag name of an element with an ID of `my-element`, we would write:

```
var myTag = $('#my-element').get(0).tagName;
```

For even greater convenience, jQuery provides a shorthand for `.get()`. Instead of writing the previous line, we can use square brackets immediately following the selector:

```
var myTag = $('#my-element')[0].tagName;
```

It's no accident that this syntax appears to treat the jQuery object as an array of DOM elements; using the square brackets is like peeling away the jQuery layer to get at the node list, and including the index (in this case, 0) is like plucking out the DOM element itself.

12.3 Event Handling

All the different visitors' actions that a web page can respond to are called events.

An event represents the precise moment when something happens.

Examples:

- moving a mouse over an element
- selecting a radio button
- clicking on an element

The term "fires/fired" is often used with events. Example: "The keypress event is fired, the moment you press a key".

Here are some common DOM events:

Mouse Events	Keyboard Events	Form Events	Document/Window Events
click	keypress	submit	load
dblclick	keydown	change	resize
mouseenter	keyup	focus	scroll
mouseleave		blur	unload

jQuery Syntax For Event

To assign a click event to all paragraphs on a page, you can do this:

```
$("#p").click();
```

The next step is to define what should happen when the event fires. You must pass a function to the event:

```
$("#p").click(function(){
    // action goes here!!
});
```

Commonly Used jQuery Event Methods

```
$(document).ready()
```

The `$(document).ready()` method allows us to execute a function when the document is fully loaded. This event is already explained in the jQuery Syntax chapter.

```
click()
```

The `click()` method attaches an event handler function to an HTML element.

The function is executed when the user clicks on the HTML element.

The following example says: When a click event fires on a <p> element; hide the current <p> element:

#Code

```
$("#p").click(function(){  
    $(this).hide();  
});
```

Summary

- With the techniques that we have covered in this chapter, we should now be able to locate sets of elements on the page in a variety of ways. In particular, we learned how to style top-level and sub-level items in a nested list by using basic CSS selectors, how to apply different styles to different types of links by using attribute selectors, add rudimentary striping to a table by using either the custom jQuery selectors:odd and:even or the advanced CSS selector:nth-child(), and highlight text within certain table cells by chaining jQuery methods.
- So far, we have been using the \$(document).ready() method to add a class to a matched set of elements. In the next chapter, we'll explore ways in which to add a class in response to a variety of user-initiated events.

Keywords

jQuery : The jQuery library provides methods to handle DOM events. Most jQuery methods correspond to native DOM events.

Events : To handle DOM events using jQuery methods, first get the reference of DOM element(s) using jQuery selector and invoke appropriate jQuery event method.

DOM: The Document Object Model is a cross-platform and language-independent interface that treats an XML or HTML document as a tree structure wherein each node is an object representing a part of the document. The DOM represents a document with a logical tree.

Self Assessment

1. Which of the following is a single global function defined in the jQuery library?
A. jQuery()
B. \$()
C. Queryanalysis()
D. global()
2. Which of the following is a factory function?
A. \$()
B. jQuery()
C. Queryanalysis()
D. onclick()
3. Which of the following is a heavily overloaded function?
A. jQuery()

- B. `$()`
 - C. `script()`
 - D. Both `jQuery()` and `$()`
4. Which jQuery method is used to hide selected elements?
- A. `hidden()`
 - B. `hide()`
 - C. `visible(false)`
 - D. `display(none)`
5. Which built-in method returns the character at the specified index?
- A. `characterAt()`
 - B. `getCharAt()`
 - C. `charAt()`
 - D. None of the above
6. Using _____ function, we can hold or release the execution of jQuery's ready event.
- A. `jQuery.holdReady()`
 - B. `jQuery.ready()`
 - C. `jQuery.hold()`
 - D. `jQuery.holdready()`
7. Which of the following jQuery method checks the current selection against an expression?
- A. `getIs(selector)`
 - B. `is(selector)`
 - C. `checkIs(selector)`
 - D. None of the above
8. Is jQuery a library for client scripting or server scripting?
- A. Server scripting
 - B. Client scripting
 - C. Both of these
 - D. None
9. In which year jQuery developed?
- A. 2001
 - B. 2004
 - C. 2005
 - D. 2006

10. Which of the following sign is used as a shortcut for jQuery?
- A. the % sign
 - B. the & sign
 - C. the \$ sign
 - D. the @ sign
11. Which jQuery method is used to set one or more style properties to the selected element?
- A. The `html()` method
 - B. The `style()` method
 - C. The `css()` method
 - D. All of the above
12. Which of the jQuery function prevents the code from running before the loading of the document finishes?
- A. `$(document).load()`
 - B. `$(document).unload()`
 - C. `$(document).ready()`
 - D. `$(document).trim()`
13. JQuery is server side scripting.
- A. True
 - B. False
14. With jQuery, look at the following selector: `$("div.intro")`. What does it select?
- A. The first div element with `class="intro"`
 - B. All div elements with `class="intro"`
 - C. The first div element with `id="intro"` correct
 - D. All div elements with `id="intro"`
15. Which of the following is correct?
- A. jQuery is a JavaScript Library
 - B. jQuery is a JSON Library
 - C. All of above
 - D. None of above

Answers for SelfAssessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. A | 2. B | 3. D | 4. B | 5. C |
| 6. A | 7. B | 8. B | 9. A | 10. C |
| 11. C | 12. C | 13. B | 14. C | 15. A |

Review Questions

1. What is jQuery?
2. What is the difference between JavaScript and jQuery?
3. What are the effects methods used in jQuery?
4. What are the event methods used in jQuery?
5. Explain the followings.
 - i. JQuery events
 - ii. Applications of JQuery



Further Readings

Bootstrap by Example, Silvio Morato Learning Bootstrap 4, Matt Lambert

Bootstrap in 24 Hours, By Sams Jump Start Bootstrap,



Web Links

<https://api.jquery.com/category/events/>

<https://api.jquery.com>

Unit 13: SASS

CONTENTS

Objectives

Introduction

13.1 Sass (Systematically Awesome Style Sheets)

13.2 LESS

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand Sass
- Design web page using SaSS
- Analyze LESS

Introduction

Sass(Syntactically Awesome Style Sheet) is a CSS pre-processor that is fully compatible with every version of CSS. It is a scripting language (like JS) that is compiled to CSS in the browser. It provides additional benefits over normal CSS styling that enhances the way of writing CSS styles. Since browsers are unable to read a SASS file, so, we are required to use a sass compiler that converts its file to a normal CSS file. It also helps reduces the overall length of the code by discarding the repeated CSS code and therefore saves time. It was designed by Hampton Catlin and developed by Natalie Weizenbaum in 2006.

13.1 Sass (Systematically Awesome Style Sheets)

Sass stands for Systematically Awesome Style Sheets.

It is a CSS pre-processor. It is an extension of CSS that is used to add power and elegance to the basic language. It facilitates you to add variables, nested rules, mixins, inline imports, inheritance and more, all with fully CSS-compatible syntax.

Sass is more stable and powerful CSS extension language that describes style of document cleanly and structurally. It is very useful to handle large style sheets by keeping them well organized and running quickly small style sheets.

Features of SASS:

1. SASS is CSS-compatible i.e. it is fully compatible with every version of CSS.
2. It supports the various extension of Languages such as variables, nesting, and mixins.

3. It is well-formatted with supports the customizable output.
4. It facilitates a number of useful functions for manipulating colors and other values, etc.
5. It provides the Sass pre-processor that helps the web browser recognize the Sass codes into simple standard CSS.
6. Sass is fully CSS-compatible.
7. It is more stable, powerful and elegant than CSS.
8. It is based on JavaScript and is superset of CSS.
9. It has its own syntax and compiles to readable CSS.
10. It is an open-source pre processor that is interpreted into CSS.
11. It supports language extensions such as variables, nesting, and mixins.

The conversion of one syntax to another can automatically be done using the sass-convert command-line tool in the file. SASS can be implemented in 5 ways:

- Using the import statement
- Using the node & npm
- Using the Command-line tool
- Using the Standalone-Ruby module
- Using installing the Plugin

Why use Sass

- Sass is a pre-processing language and it has its own syntax for CSS.
- It is easy, short and clean in a programming construct.
- It has some features that are used for creating awesome style sheets and facilitates writing code more efficiently and easy to maintain.
- It contains all the features of CSS along with some advance features.
- It provides document style presentation better than flat CSS.
- It facilitates reusability methods, logic statements and some of the built in functions like color manipulation, mathematics and parameter lists.
- It facilitates you to keep your responsive design project more organized.
- You don't need to repeat similar CSS again and again in your project.



Notes

Syntax for comments in regular CSS starts with /* comments...*/, while in SASS there are two type of comment, the single line comments // and the multiline CSS comments with /**/.

Installation Process of SASS

System Requirements for SASS

Operating System – Cross-platform

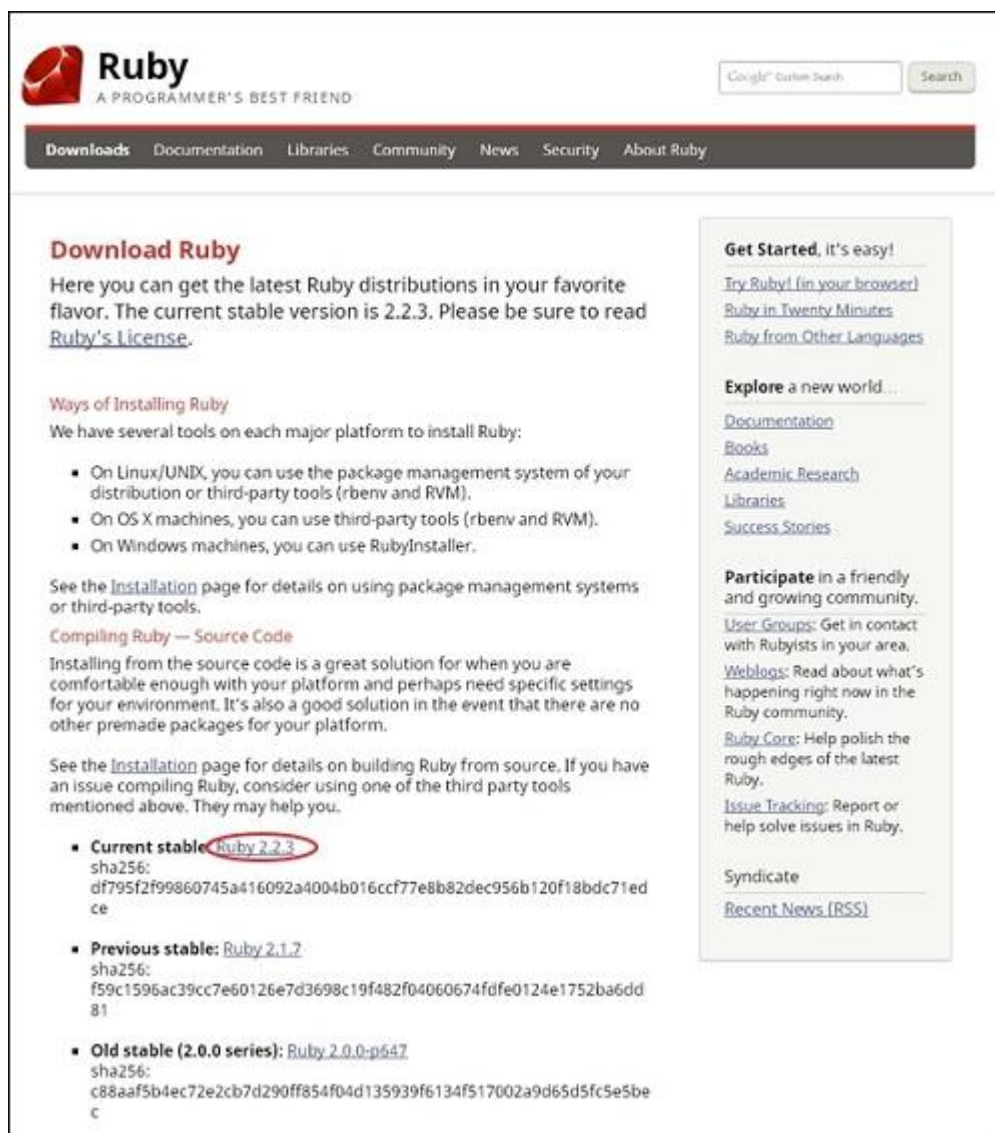
Browser Support – IE (Internet Explorer 8+), Firefox, Google Chrome, Safari, Opera

Programming Language – Ruby

Installation of Ruby

Step 1 – Open the link <https://www.ruby-lang.org/en/downloads/>, you will see a screen as shown below

–



Ruby
A PROGRAMMER'S BEST FRIEND

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Download Ruby

Here you can get the latest Ruby distributions in your favorite flavor. The current stable version is 2.2.3. Please be sure to read [Ruby's License](#).

Ways of Installing Ruby

We have several tools on each major platform to install Ruby:

- On Linux/UNIX, you can use the package management system of your distribution or third-party tools (rvm and RVM).
- On OS X machines, you can use third-party tools (rvm and RVM).
- On Windows machines, you can use RubyInstaller.

See the [Installation](#) page for details on using package management systems or third-party tools.

Compiling Ruby — Source Code

Installing from the source code is a great solution for when you are comfortable enough with your platform and perhaps need specific settings for your environment. It's also a good solution in the event that there are no other premade packages for your platform.

See the [Installation](#) page for details on building Ruby from source. If you have an issue compiling Ruby, consider using one of the third party tools mentioned above. They may help you.

- Current stable:** [Ruby 2.2.3](#)
sha256:
df795f2f99860745a416092a4004b016ccf77e8b82dec956b120f18bdc71ed
ce
- Previous stable:** [Ruby 2.1.2](#)
sha256:
f59c1595ac39cc7e60126e7d3698c19f482f04060674fdfe0124e1752ba6dd
81
- Old stable (2.0.0 series):** [Ruby 2.0.0-p647](#)
sha256:
c88aaf5b4ec72e2cb7d290ff854f04d135939f6134f517002a9d65d5fc5e5be
c

Get Started, it's easy!

[Try Ruby! \(in your browser\)](#)
[Ruby in Twenty Minutes](#)
[Ruby from Other Languages](#)

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[Issue Tracking](#): Report or help solve issues in Ruby.

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Download the *Current stable* version of the zip file.

Step 2 – Next, run the setup to install **Ruby** on the System.

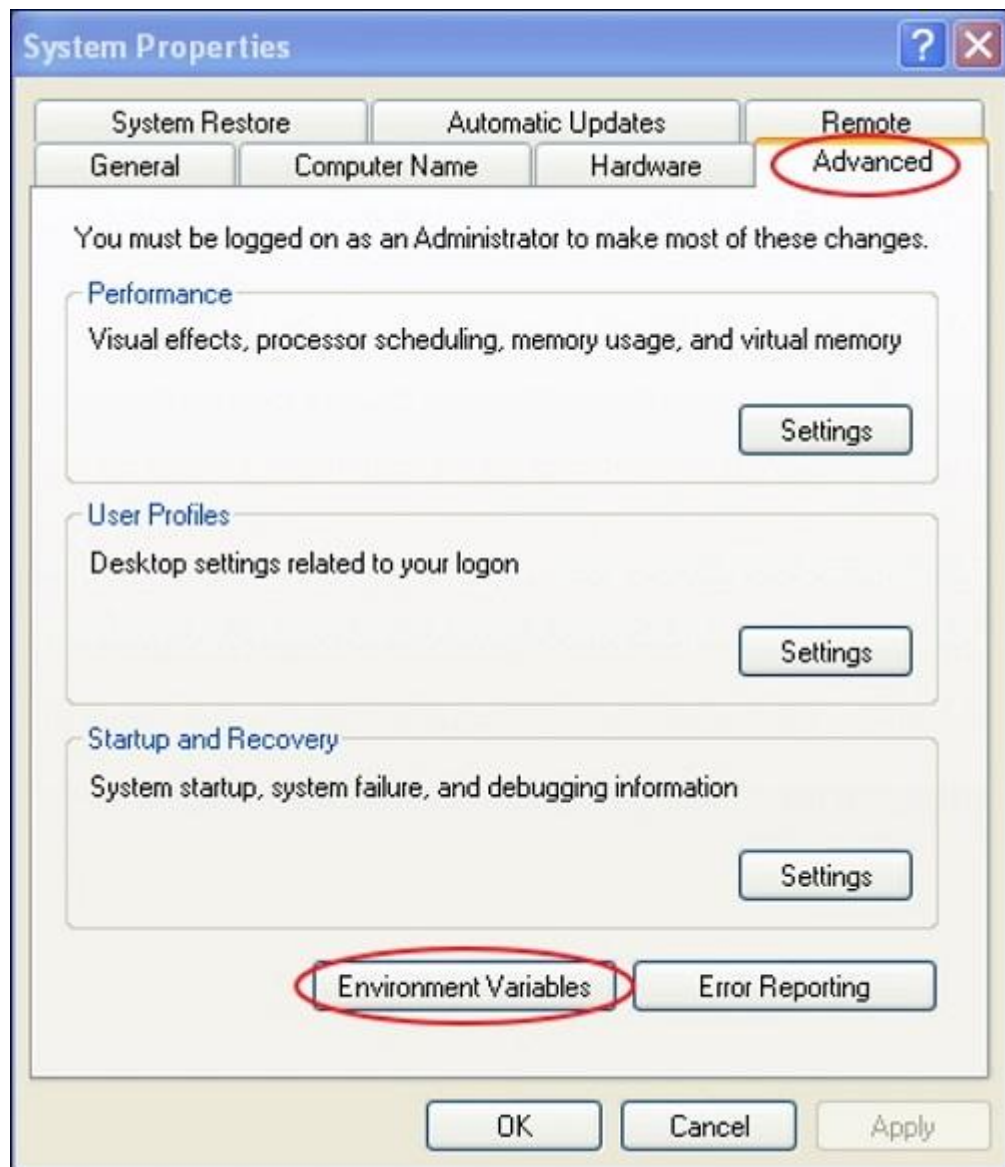
Step 3 – Next, add Ruby bin folder to your *PATH User Variable* and *System Variable* to work with gem command.

Path User Variable –

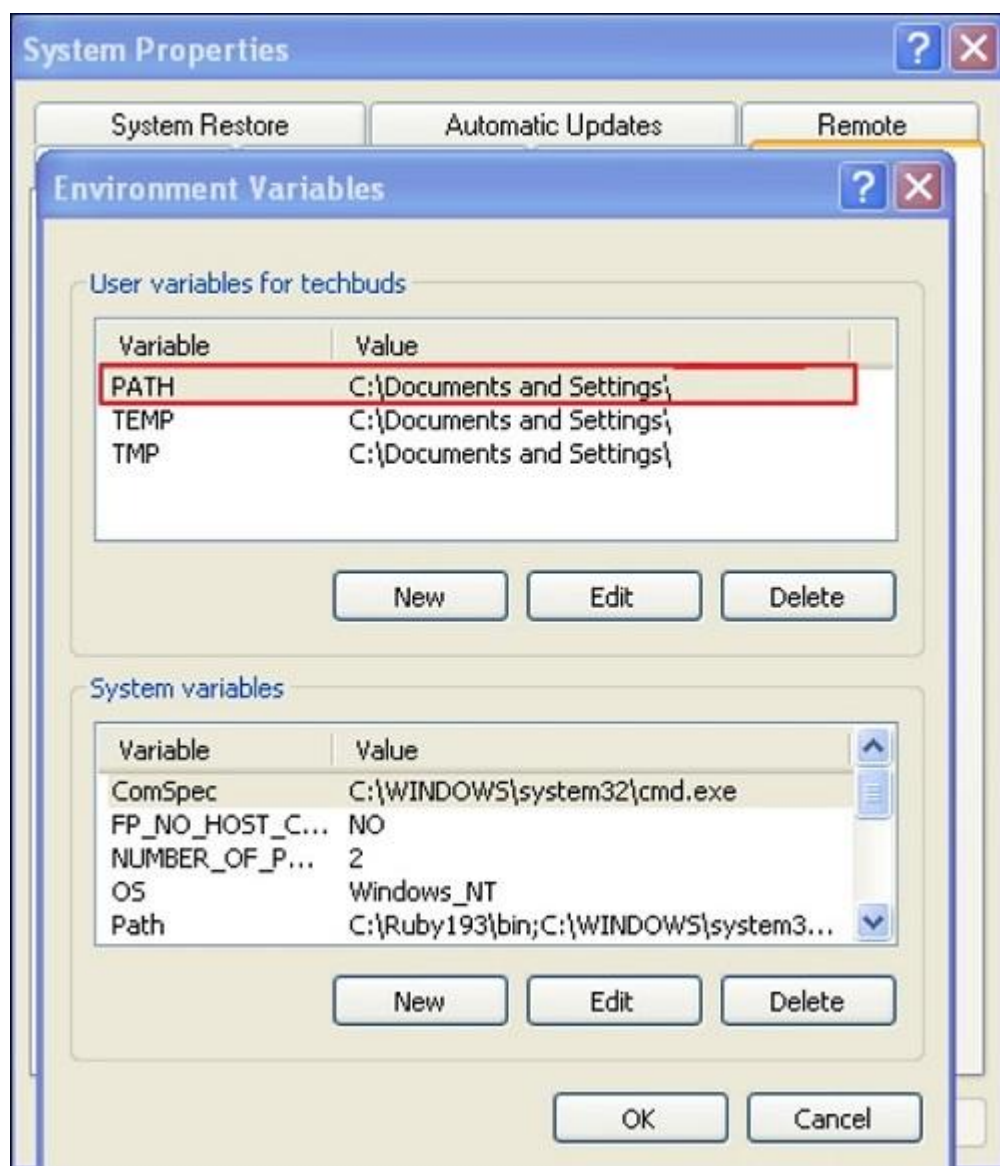
Right Click the **My Computer** icon.

Select **Properties**.

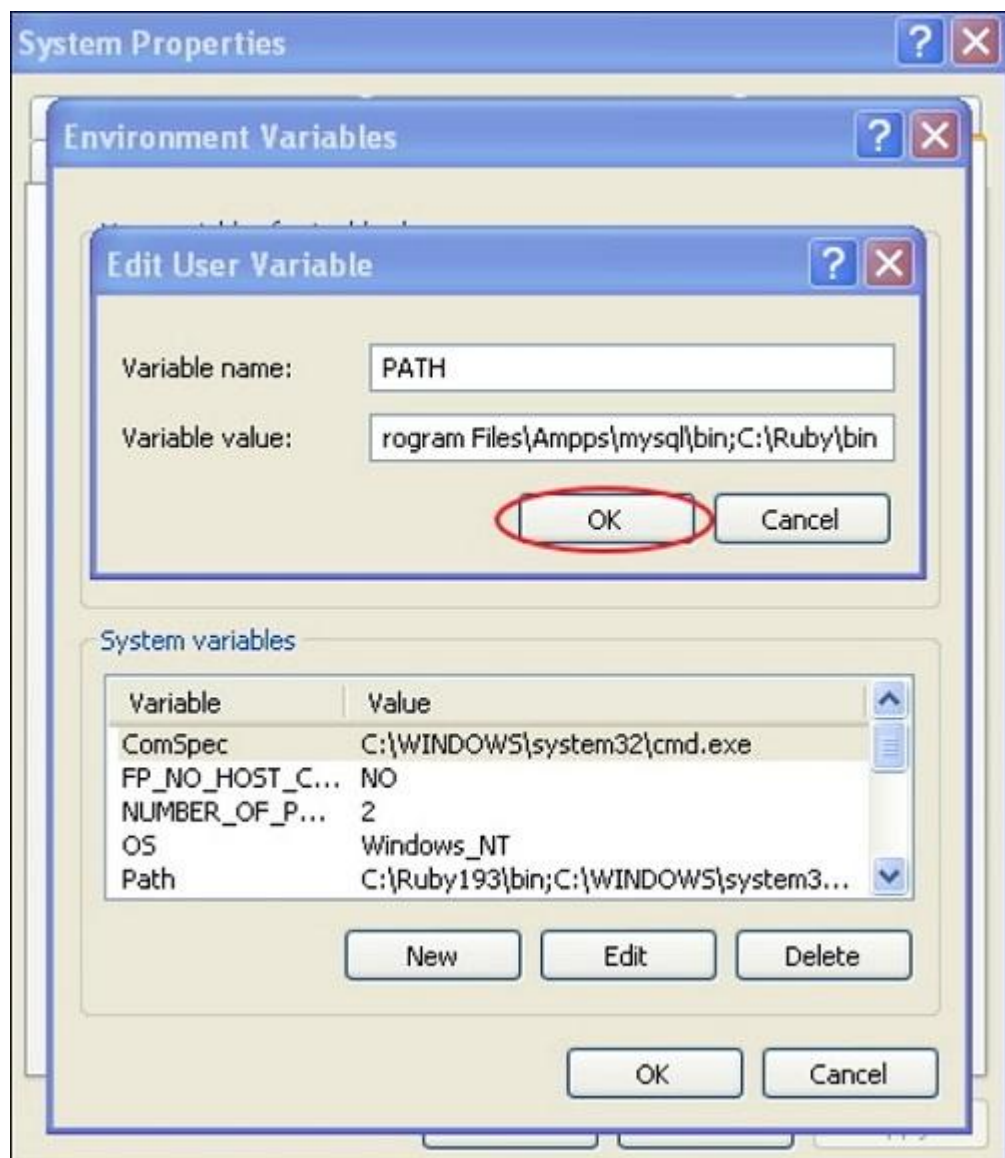
Next, click the **Advanced** tab and click **Environment Variables**.



In the *Environment Variables* window, double click the *PATH* as shown in the screenshot given below –



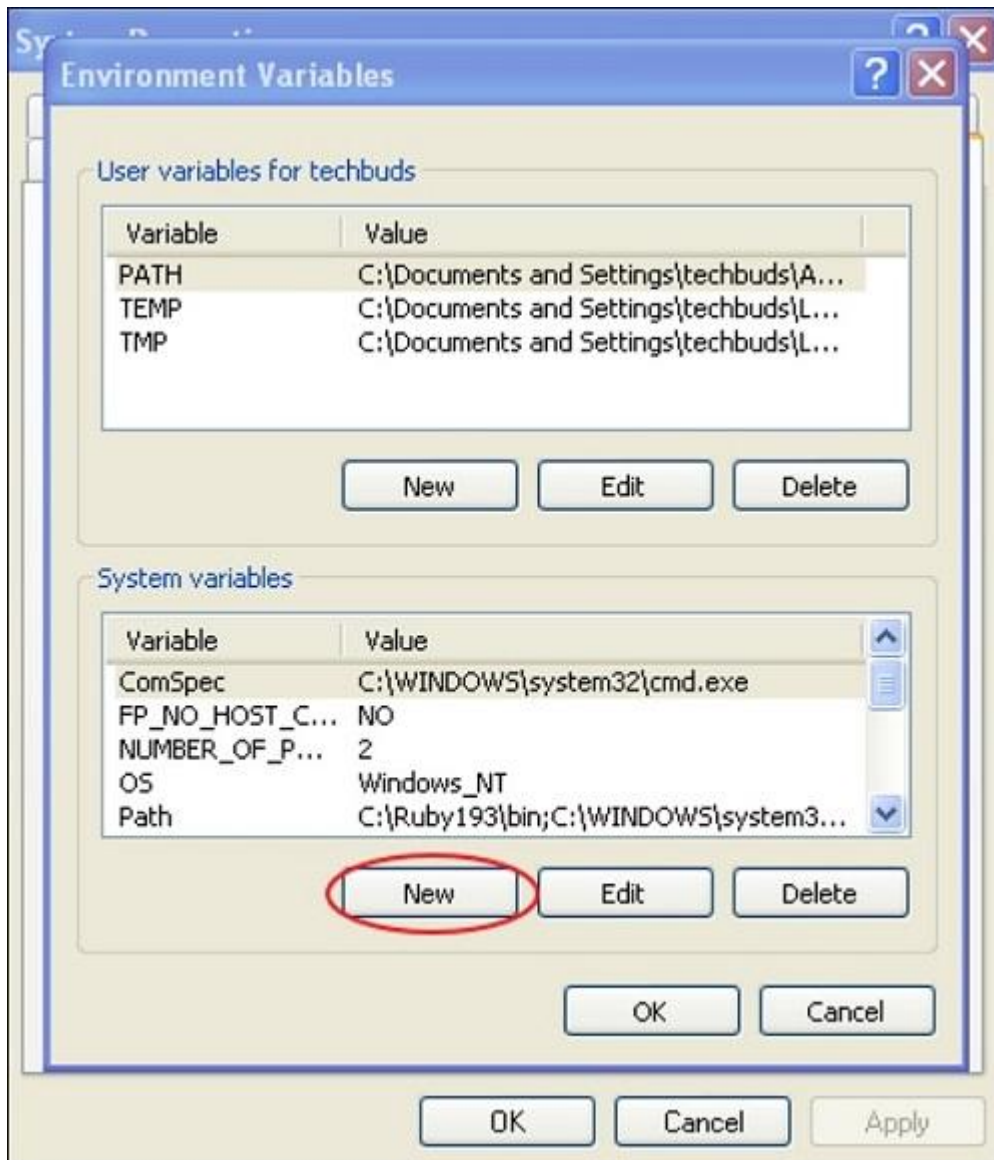
You will get an *Edit User Variable* box as shown. Add ruby bin folder path in the *Variable value* field as **C:\Ruby\bin**. If path is already set for other files, then put semicolon after that and add the Ruby folder path as shown below.



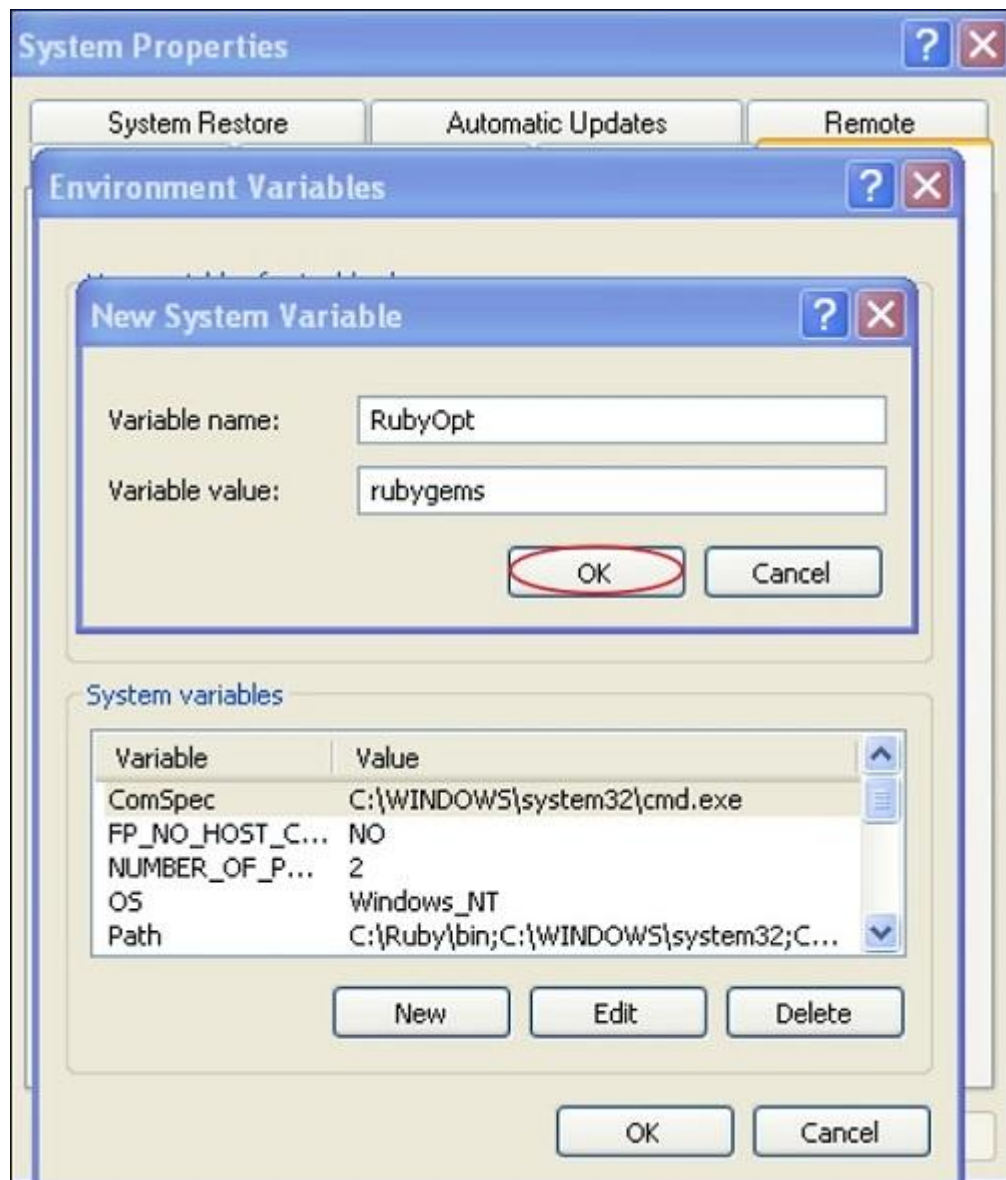
Click the **OK** button.

System Variable –

Click the **New** button.



Next, the **New System Variable** block is displayed as shown below.



Enter **RubyOpt** in the *Variable name* field and **rubygems** in the *Variable value* field. After writing the *Variable name* and *value*, click the **OK** button.

Step 4 – Open the command prompt in your system and enter the following line –

gem install sass

Step 5 – Next, you will see the following screen after installing SASS successfully.

```

C:\>cd ruby
C:\Ruby>gem install sass
Fetching: sass-3.4.19.gem (100%)
Successfully installed sass-3.4.19
1 gem installed
Installing ri documentation for sass-3.4.19...
Installing RDoc documentation for sass-3.4.19...
C:\Ruby>
  
```



Example

The following is a simple example of SASS.


```

<html>
<head>
<title> Import example of sass</title>
<linkrel="stylesheet"type="text/css"href="style.css"/>
</head>

<body>
<h1>Simple Example</h1>
<h3>Welcome to TutorialsPoint</h3>
</body>
</html>

```

Now, we will create file as *style.scss*, which is quite similar to CSS and the only one difference is that it will be saved with *.scss* extension. Both, *.htm* and *.scss* files should be created inside the folder **ruby**. You can save your *.scss* file in the folder **ruby\lib\sass** (before this process, create a folder as **sass** in lib directory).

```

h1{
  color: #AF80ED;
}

```

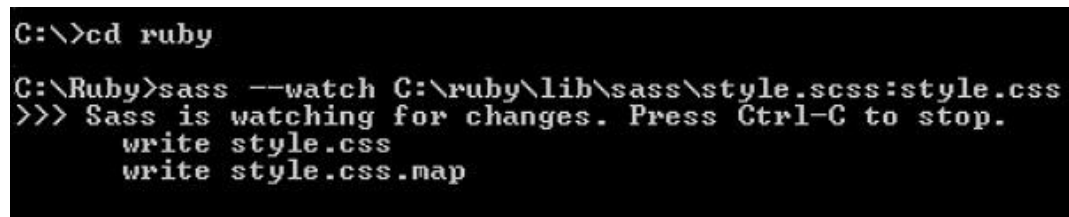
```

h3{
  color: #DE5E85;
}

```

You can tell SASS to watch the file and update the CSS whenever SASS file changes, by using the following command –

```
sass --watch C:\ruby\lib\sass\style.scss:style.css
```



```

C:\>cd ruby
C:\Ruby>sass --watch C:\ruby\lib\sass\style.scss:style.css
>>> Sass is watching for changes. Press Ctrl-C to stop.
      write style.css
      write style.css.map

```

When you run the above command, it will create the *style.css* file automatically. Whenever you change the SCSS file, the *style.css* file will be updated automatically.

The *style.css* file will have the following code when you run the above given command –

```

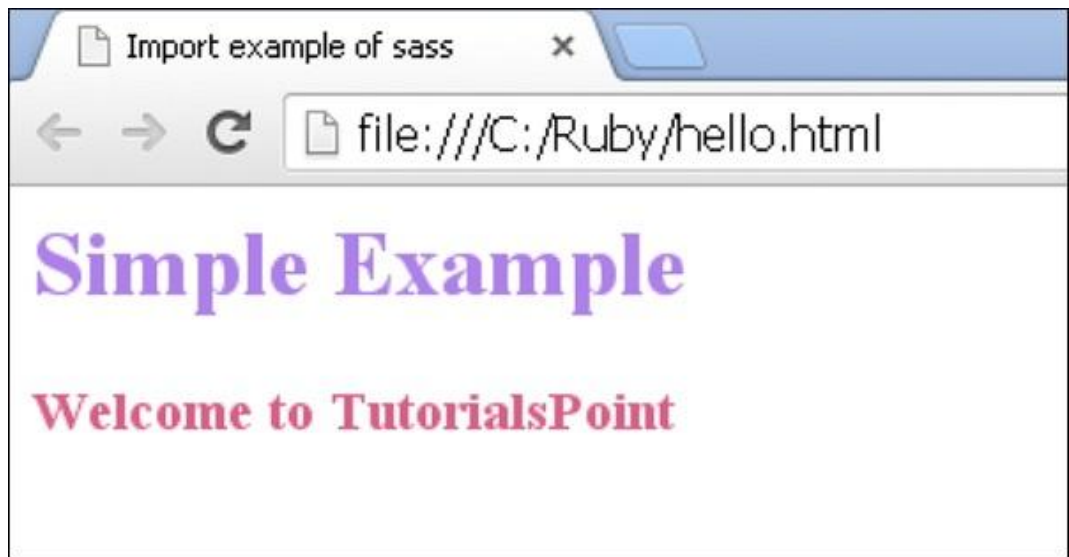
style.css
h1 {
  color: #AF80ED;
}
h3 {
  color: #DE5E85;
}

```

Let us carry out the following steps to see how the above given code works –

Save the above given code in **hello.html** file.

Open this HTML file in a browser.



Example

Mystyle.scss

```
$myFont: Helvetica, sans-serif;  
$myColor: red;  
$myFontSize: 18px;  
$myWidth: 680px;
```

```
body {  
  font-family: $myFont;  
  font-size: $myFontSize;  
  color: $myColor;  
}
```

```
#container {  
  width: $myWidth;  
}
```

Mystyle.css

```
body {  
  font-family: Helvetica, sans-serif;  
  font-size: 18px;  
  color: red;  
}
```



```
#container {  
  width: 680px;  
  border: 1px blue double;  
}
```

Page.html

```
<!DOCTYPE html>  
<html>  
<link rel="stylesheet" href="mystyle.css;?>">  
<body>  
  
<h1>Hello World</h1>  
  
<p>This is a paragraph.</p>  
  
<div id="container">This is some text inside a container.</div>  
  
</body>  
</html>
```

Output

Hello World

This is a paragraph.

This is some text inside a container.

13.2 LESS

Less is a CSS pre-processor that facilitates you to customize, manage and reuse the style sheets for the webpage. Less is an extension of CSS and a dynamic style sheet language which can be run on client side or server side.

Less is an open source language. It is also cross browser compatible.

Features of Less

- Less is clean, compact, more readable code and written in a well organized way.
- Less supports cross-browser compatibility.
- Less is faster and easier.
- Less is written in JavaScript. It compiles faster than other preprocessor of CSS.
- Less provides variables which makes its maintenance faster.
- Less provides nesting which makes the code short, clean and organized in a specific way

- Less facilitates you to define styles which can be reused throughout the code.
- Less is an extension of CSS. So it is also called super set of CSS.
- Less is capable enough to sort out the problem of code redundancy.

Advantages of Less

1. Less is a CSS preprocessor. After compilation, it generates simple CSS which works across the browsers.
2. Less supports cross-browser compatibility.
3. Less codes are simple, clean and well organized because the use of nesting.
4. Maintenance in Less can be achieved faster because the use of variables.
5. Less provides a list of operators which makes coding faster and time saving.
6. Less facilitates you to reuse the whole classes easily by referencing them in your rule-set.
7. Less is new and preferred over the conventional CSS because may ease the lengthy styling.

Disadvantages of Less

1. You must have to spend some time to learn Less if you are new to CSS preprocessing.
2. Less provides fewer frameworks as compared to older preprocessor like SASS which contains frameworks like Compass, Gravity and Susy.
3. In Less, there is a tight coupling between modules so it takes more effort to reuse and/or test dependent modules.

Less Comments

Less comments are non-executable statements that are placed inside the source code. These comments are written to make source code clear and easier to understand by other developers and testers. Comments can be written in block style and inline within the Less code, but single line comments are not appeared in CSS code.

There are two types of comments supported in Less.

Single line comments: In Less, single line comments are written using `//` followed by comments. The single line comments are not displayed in generated CSS output.

Multiline comments: In Less, multiline comments are written between `/* */`. The multiline comments are preserved in generated CSS output.

Less code looks like:-

```
@color-base: #2d5e8b;

.class1 {
  background-color: @color-base;
  .class2 {
    background-color: #fff;
    color: @color-base;
  }
}
```


Why Sass is considered better than LESS?

- Sass allows you to write reusable methods and use logic statements, e., loops, and conditionals
- Sass user can access Compass library and use some awesome features like dynamic sprite map generation, legacy browser hacks and cross-browser support for CSS3 features
- Compass also allows you to add an external framework like Blueprint, Foundation or Bootstrap on top
- In LESS, you can write a basic logic statement using a 'guarded mixin', which is equivalent to Sass if statements
- In LESS, you can loop through numeric values using recursive functions while Sass allows you to iterate any kind of data
- In Sass, you can write your own handy functions

LESS VS SASS

LESS	SaSS
LESS uses JavaScript and processed at client-side	Sass is coded in Ruby and thus processed to server-side
Variable names are prefaced with the @symbol	Variable name are prefaced with \$ symbol
LESS does not inherit multiple selectors with one set of properties	Sass inherits multiple selectors with one set of properties
LESS does not work with "unknown" units neither it returns syntax error notification for incompatible units or maths related syntax error	Sass allows you to work with "unknown" units also returns a syntax error notification for incompatible units

Summary

- Less (which stands for Leaner Style Sheets) is a backwards-compatible language extension for CSS. This is the official documentation for Less, the language and Less.js, the JavaScript tool that converts your Less styles to CSS styles.
- Sass is completely compatible with all versions of CSS. We take this compatibility seriously, so that you can seamlessly use any available CSS libraries.
- Sass boasts more features and abilities than any other CSS extension language out there. The Sass Core Team has worked endlessly to not only keep up, but stay ahead.
- There are an endless number of frameworks built with Sass. Bootstrap, Bourbon, and Susy just to name a few.

Keywords

Less: Less is a dynamic preprocessor style sheet language that can be compiled into Cascading Style Sheets and run on the client side or server side. Designed by Alexis Sellier, Less is influenced by Sass and has influenced the newer "SCSS" syntax of Sass, which adapted its CSS-like block formatting syntax.

SaSS: Sass is a preprocessor scripting language that is interpreted or compiled into Cascading Style Sheets. SassScript is the scripting language itself.

SelfAssessment

1. What are the most attractive features of SASS?
 - A. It is more stable, powerful and fully compatible to CSS3
 - B. It is time saving because it facilitates you to write CSS in less code
 - C. It uses its own syntax
 - D. All of these

2. Who is the inventor of SASS?
 - A. James Gosling
 - B. Guido van Rossum
 - C. MiskoHevery
 - D. Hampton Catlin

3. What are the key features for Sass include
 - A. Full CSS3-compatible
 - B. Language extensions such as nesting, variables, and mixins
 - C. Many useful functions for manipulating colors and other values
 - D. All of the above

4. What are the reasons behind using SASS?
 - A. You can write codes easily and efficiently and they are easy to maintain
 - B. It is a pre-processing language which provides its own syntax for CSS
 - C. It is a superset of CSS which contains all the features of CSS and is an open source pre-processor, coded in Ruby
 - D. All of the above

5. From the following what are the reasons behind using SASS?
 - A. You can write codes easily and efficiently and they are easy to maintain
 - B. It is a pre-processing language which provides its own syntax for CSS
 - C. It is more stable and powerful CSS extension and style documents more clearly and structurally
 - D. All of the above

6. What are the data types that SassScript supports?
 - A. Numbers
 - B. Strings of texts
 - C. Colors

- D. All of these
7. What is the difference between Sass and SCSS?
- A. Sass is a CSS pre-processor with syntax advancements and an extension of CSS3
 - B. Sass has two syntax
 - C. The first syntax is SCSS" and it uses the .scss extension
 - D. All of the above
8. How many ways SASS can be used?
- A. It can be used as a command line tool
 - B. It can be used as a standalone Ruby module
 - C. It can be used as a plugin for any Rack-enabled framework
 - D. All the above mentioned
9. Which of the following are types of mixin arguments?
- A. Keyword Arguments
 - B. variable Arguments
 - C. All of the above
 - D. None
10. What is the correct full form of SASS?
- A. System Asymmetric Style Sheets
 - B. Symbolic Asymmetric Style Sheets
 - C. Systematic Awesome Style Sheets
 - D. Syntactically Awesome Style Sheets
11. Why is SASS called a superset of CSS?
- A. SASS is called a superset of CSS because it is better than CSS.
 - B. SASS is called a superset of CSS because it is an open-source pre-processor written in the Ruby programming language.
 - C. SASS is called a superset of CSS because it contains all the features of CSS.
 - D. None of the Above
12. CSS stands for -
- A. Cascade style sheets
 - B. Color and style sheets
 - C. Cascading style sheets
 - D. None of the above
13. Which of the following is the correct syntax for referring the external style sheet?
- A. <style src = example.css>
 - B. <style src = "example.css" >

- C. <stylesheet> example.css </stylesheet>
- D. <link rel="stylesheet" type="text/css" href="example.css">

14. Which of the following directive is used to set the style rule to different media types?

- A. @media
- B. @import
- C. @extend
- D. @debug

15. What is the correct way to define a variable in SASS?

- A. \$primary-color: #888
- B. @primary-color: #888
- C. %primary-color: #888
- D. #primary-color: #888

Answers for Self Assessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. D | 2. D | 3. D | 4. D | 5. D |
| 6. D | 7. D | 8. D | 9. C | 10. D |
| 11. C | 12. C | 13. D | 14. A | 15. A |

Review Questions

1. Explain what is Sass? How it can be used?
2. List out the key features for Sass?
3. Explain what is the difference between Sass and SCSS?
4. Why is Sass considered better than LESS?
5. Explain how Sass comments are different from regular CSS?



Further Readings

Bootstrap by Example, Silvio Morato Learning Bootstrap 4, Matt Lambert

Bootstrap in 24 Hours, By Sams Jump Start Bootstrap,



Web Links

<https://sass-lang.com/>

<https://lesscss.org/>

Unit 14: NPM Scripts

CONTENTS

Objectives

Introduction

14.1 Implementing Tools with NPM Scripts

14.2 Grunt

14.3 Task Automator

14.4 Gulp

Summary

Keywords

Self Assessment

Answers for Self-Assessment

Review Questions

Further Readings

Objectives

After studying this unit, you will be able to:

- Understand npm Scripts
- Understand grunt and gulp

Introduction

NPM is a Node Package Manager. It is the world's largest Software Registry. This registry contains over 800,000 code packages. Many Open-source developers use npm to share software. Many organizations also use npm to manage private development.

"npm scripts" are the entries in the scripts field of the package.json file. The scripts field holds an object where you can specify various commands and scripts that you want to expose. These can be executed using the following command.

```
npm run <script-name>
```

NPM scripts are used to automate tasks like minifying CSS, uglifying JavaScript, building project. NPM scripts are versatile and simple and by learning fewer tools, we can automate tasks in our web project.

14.1 Implementing Tools with NPM Scripts

There are typically two types of JavaScript build tools: task runners and module bundlers. In this article, we'll look at how to use project specific npm build scripts as a build tool and task runner, instead of relying on task runners like Gulp and Grunt or module bundlers like Webpack.

Grunt and Gulp are task runners, they automate recurring manual tasks in a development process. Webpack, on the other hand, is a module bundler which takes separate pieces of application code, each with their own dependencies, and bundles them into static assets.

In our Grunt and Gulp article, we mentioned another build tool alternative that we didn't really go into: npm scripts. A few of you asked in the comments that you'd like to know more about how you can use npm scripts as a build tool/task runner, so that's exactly what we're going to look at.

Why Npm Scripts?

If you use build tools like Grunt, Gulp, and Webpack for long enough, you'll begin to find that you start fighting with the tool rather than focusing on writing the code for your application. Each tool has its own way of doing things and that means that each tool comes with its own quirks and gotchas that need to be learned.

Both Grunt and Gulp heavily rely on the use of plugins to add functionality, and most of those plugins are wrappers around existing npm packages. This can lead to problems like:

1. There isn't a plugin for the package you want to use.
2. The plugin is out of date and doesn't support the underlying package properly.
3. The plugin doesn't support a feature you'd like to use for the underlying package.
4. The plugin documentation is lacking or unclear.
5. The plugin doesn't handle errors well.

Since most packages usually have a CLI, a simple solution to these problems would be to remove the (sometimes complex) abstraction of build tools altogether and run the underlying packages manually on the command-line. This is a great solution, but how are you going to remember all of those CLI commands and their options? And how are you going to chain them together? Wouldn't it be nice if you could just run a single CLI command and have them all run in the right order, and at the same time?

Npm Scripts

Enter npm scripts, which have been around since at least version 6 of npm. Using the scripts property in your package.json file, it's possible to define custom scripts to run various CLI commands. This is very similar to the GNU Make tool, used by desktop application developers for Unix-like systems to build and manage their applications.

Once you define your scripts in your package.json, npm has a run command that can execute these scripts. If you've ever used a package that asked you to run a command like npm start or npm run test, then you've used npm scripts.

A script could be as simple as a single terminal command, or a more complex series of commands that need to be run in a particular order.

To use npm scripts as a build tool we're going to define a bunch of scripts in a package.json file, similar to defining the tasks we want to run in a config file in other build tools. The difference with npm scripts is that we're going to run the package CLI without any plugins, then chain the scripts together so we can trigger a build with a single command. For demonstration purposes we're going to recreate the same build process that we used in the Gulp vs Grunt article:

1. Compile Sass to CSS.
2. Concatenate and minify CSS and JavaScript.
3. Optimize images.

14.2 Grunt

Grunt is a JavaScript task runner, a tool used to automatically perform frequent tasks such as minification, compilation, unit testing, and linting. It uses a command-line interface to run custom

tasks defined in a file. Grunt was created by Ben Alman and is written in Node.js. It is distributed via npm.

Why Use Grunt?

Grunt can perform repetitive tasks very easily, such as compilation, unit testing, minifying files, running tests, etc.

Grunt includes built-in tasks that extend the functionality of your plugins and scripts.

The ecosystem of Grunt is huge; you can automate anything with very less effort.

History

The first lines of source code were added to GruntJS in 2011. The Grunt v0.4 was released on February 18, 2013. The Grunt v0.4.5 was released on May 12, 2014. The stable version of Grunt is 1.0.0 rc1 which was released on February 11, 2016.

Advantages

- Using Grunt, you can perform minification, compilation, and testing of files easily.
- Grunt unifies the workflows of web developers.
- You can easily work with a new codebase using Grunt because it contains less infrastructure.
- It speeds up the development workflow and enhances the performance of projects.

Disadvantages

Whenever npm packages are updated, you need to wait until the author of the Grunt updates it.

Every task is designed to do specified work. If you want to extend a specified task, then you need to use some tricks to get the work done. Grunt includes a large number of configuration parameters for individual plugins. Usually, Grunt configuration files are longer in length.

Some of the most prominent features of GruntJS are listed below –

1. Grunt makes the workflow as easy as writing a setup file.
2. You can automate repetitive tasks with minimum effort.
3. Grunt is a popular task runner based on NodeJS. It is flexible and widely adopted.
4. It has a straightforward approach which includes tasks in JS and config in JSON.
5. Grunt minifies JavaScript, CSS files, testing files, compiling CSS preprocessor files (SASS, LESS), etc.
6. Grunt includes built-in tasks that extend the functionality of your plugins and scripts.
7. It speeds up the development workflow and enhances the performance of projects.
8. You can easily work with a new codebase using Grunt because it contains less infrastructure.
9. The ecosystem of Grunt is huge; you can automate anything with very less effort.

14.3 Task Automator

Taskr is a highly performant task automation tool, much like Gulp or Grunt, but written with concurrency in mind. With Taskr, everything is a coroutine, which allows for cascading and composable tasks; but unlike Gulp, it's not limited to the stream metaphor.

Taskr is extremely extensible, so anything can be a task. Our core system will accept whatever you throw at it, resulting in a modular system of reusable plugins and tasks, connected by a declarative taskfile.js that's easy to read.

Features

- lightweight: with 6 dependencies, installation takes seconds
- minimal API: Taskr only exposes a couple methods, but they're everything you'll ever need
- performant: because of Bluebird, creating and running Tasks are quick and inexpensive
- cascading: sequential Task chains can cascade their return values, becoming the next Task's argument
- asynchronous: concurrent Task chains run without side effects & can be yielded consistently
- composable: chain APIs and Tasks directly; say goodbye to pipe() x 100!
- modular: easily share or export individual Tasks or Plugins for later use
- stable: requires Node >= 4.6 to run (LTS is 6.11)



Example

Here's a simple taskfile (with shorthand generator methods) depicting a parallel chain.

```
const sass = 'src/{admin,client}/*.sass';
const js = 'src/{admin,client}/*.js';
const dist = 'build';

module.exports = {
  *lint(task) {
    yield task.source(js).xo({ esnext:true });
  },
  *scripts(task) {
    yield task.source(js).babel({ presets:['es2015'] }).target(`${dist}/js`);
  },
  *styles(task) {
    yield task.source(sass).sass({ outputStyle:'compressed' }).autoprefixer().target(`${dist}/css`);
  },
  *build(task) {
    yield task.parallel(['lint', 'scripts', 'styles']);
  }
}
```

Concepts

Core

Taskr is a task runner. It's designed to get you from A to B -- that's it.

If it helps, imagine you're dining in a restaurant and Taskr is the food runner. Taskr's role is solely to collect meals from the kitchen (task.source) and deliver them to the correct table (task.target). As a food runner, Taskr may do this one plate at a time (task.serial) or deliver multiple plates at once (task.parallel). Either way, Taskr only cares about going from A to B. It may not be the most glamorous job, but as far as you (the patron) are concerned, it's incredibly important because it brings you food.

Plugins

Because Taskr is single-minded and cares only about executing tasks, everything else is a plugin. This keeps development with Taskr easy, approachable, and lightweight.

You see, installing Taskr gives access to a reliable task runner. You decide what it can do, provide it functionality, and dictate when to do it. You're in full control.

Through plugins, you are able to capture useful behavior and share them across tasks or projects for repeated use. Plugins come in three flavors:

external - installed via NPM; called "external" because they live outside your codebase

inline - generally simple, one-time functions; not sensible for reuse since declared within a task (hence "inline")

local - private, reusable plugins; appear exactly like external plugins but not public on NPM.

Tasks

Tasks are used to tell Taskr what to do. They are written as generator functions & converted to coroutines internally. They're also fully self-contained and, like plugins, can be shared across projects if desired.

Upon runtime, tasks are cheap to create, so are also destroyed once completed. This also helps Taskr remain efficient; history won't weigh it down.

Lastly, tasks have the power to start other Tasks, including serial and parallel chains!

Taskfiles

Much like Gulp, Taskr uses a taskfile.js (case sensitive) to read and run your Tasks. However, because it's a regular JavaScript file, you may also require() additional modules and incorporate them directly into your Tasks, without the need for a custom Plugin!

```
const browserSync = require('browser-sync');
```

```
exports.serve = function * (task) {
  browserSync({
    port: 3000,
    server: 'dist',
    middleware: [
      require('connect-history-api-fallback')()
    ]
  });
  yield task$.log('> Listening on localhost:3000');
}
```

Taskfiles should generally be placed in the root of your project, alongside your package.json. Although this is not required, Taskr (strongly) prefers this location.

14.4 Gulp

Gulp is a task runner that uses Node.js as a platform. It purely uses the JavaScript code and helps to run front-end tasks and large-scale web applications. Gulp builds system automated tasks like CSS and HTML minification, concatenating library files, and compiling the SASS files. These tasks can be run using Shell or Bash scripts on the command line.

This tutorial teaches you how to use Gulp to run front-end tasks and large-scale web applications in simple and easy steps. After completing this tutorial, you will find yourself at a moderate level of expertise in using Gulp from where you may take yourself to the next levels.

Why to use Gulp?

It is shorter, simpler and faster as compared to other task runner.

Uses SASS and LESS as CSS preprocessor.

Automatically refreshes page after editing the source files.

Easy to understand and build the Gulpfile.js because, it uses pure JavaScript code to build the task.

History

All the documentation of Gulp is covered by the CC0 license. Initially, Gulp v1.0.0 was released on January 15, 2015, and the current version of Gulp is v3.9.0.

Features

Provides minification and concatenation.

Uses pure JavaScript code.

Converts LESS or SASS to CSS compilation.

Manages file manipulation in the memory and enhances speed by using the Node.js platform.

Advantages

- Huge speed advantage over any other task runner
- Easy to code and understand.
- Easy to test the web applications..
- Plugins are simple to use and they are designed to do one thing at a time.
- Performs repetitive tasks repeatedly such as minifying stylesheets, compressing images, etc.

Disadvantages

- More number of dependencies and is a newcomer compared to Grunt.
- Using Gulp plugins, you cannot perform multiple tasks.
- Configuration is not as clean as Grunt.

Summary

- Grunt is a JavaScript based task runner which means it can automate repetitive tasks in a workflow and it can be used as a command line tool for JavaScript objects.
- Gulp is a task runner that uses Node.js as a platform. It purely uses the JavaScript code and helps to run front-end tasks and large-scale web applications.
- An npm script is a convenient way to bundle common shell commands like a set of built-in and custom scripts for your project. They are typically terminal commands or a string of terminal commands that help automate repetitive tasks. In short, NPM scripts are terminal commands that perform a set of actions.

- The npm also acts as a command-line utility for the Node.js project for installing packages in the project, dependency management, and even version management.

Keywords

Npm: npm is a short form of Node Package Manager, which is the world's largest software registry. The open-source web project developers use it from the entire world to share and borrow packages.

Gulp: Gulp is a request line task runner for Node.js. Gulp lets us modernize cycles and get excess things done quickly.

Grunt: Grunt is a JavaScript task runner that helps us in automating mundane and repetitive tasks like minification, compilation, unit testing, linting, etc. Grunt has hundreds of plugins to choose from, you can use Grunt to automate just about anything with a minimum of effort.

SelfAssessment

1. Streams give higher flow control. Is this True or False?
 - A. True
 - B. False
2. Which plug-in has optimizers and compressors?
 - A. gulp-changed
 - B. gulp-plumber
 - C. gulp-imagemin
 - D. gulp-watch
3. The different kinds of Streams include _____.
 - A. readable,writable,divide, classic, transcend
 - B. readable, writable, divide, correspond, transform
 - C. readable,writable,duplex, classic, transform
 - D. readable,writable,divide, check, transform
4. While installing gulp, the first installation step would be _____.
 - A. \$npm install gulp g savedev
 - B. \$npm install gulp --save-dev
 - C. \$npm install gulp g
 - D. \$npm install gulp g --save-dev
5. Streams which play vital role in gulp, has its origin from _____.
 - A. Unix
 - B. Node.js
 - C. Gulpfile.js
 - D. All the options
6. Between Grunt and Gulp, which is relatively fast?
 - A. Both are of same speed

- B. Neither of the same
 - C. Grunt
 - D. Gulp
7. While installing gulp with `$npm install gulp --save-dev`, what does `--save-dev` represents?
- A. Missed out components of global installation will be taken here
 - B. Installs Gulp as a development dependency and `package.json` updated
 - C. Ensures CLI installation
 - D. triggers dependency between project and cli
8. Streams are Asynchronous. Is this True or False?
- A. False
 - B. True
9. Before installation of Gulp, installation of _____ acts as pre-requisite.
- A. Bower.js
 - B. Broccoli.js
 - C. Node.js
 - D. Gulp.js
10. How many types of Streams are available?
- A. 5
 - B. 4
 - C. 6
 - D. 3
11. Which command in the CLI will trigger the 'default' task?
- A. `run default gulp`
 - B. `run gulp default`
 - C. `gulp`
 - D. `run gulp`
12. In-memory caching is enabled with the help of which gulp plug-in?
- A. `gulp-sess`
 - B. `gulp-cached`
 - C. `gulp-cookie`
 - D. `gulp-tempcache`
13. Which of the following command is used to start a REPL session?
- A. `$ node`
 - B. `$ node start`
 - C. `$ node repl`

D. \$ node console

14. Which of the following extension is used to save the Node.js files?

- A. .js
- B. .node
- C. .java
- D. .txt

15. All APIs of Node.JS are.

- A. Asynchronous
- B. Synchronous
- C. Both of the above.
- D. None of the above.

Answers for Self-Assessment

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. A | 2. C | 3. C | 4. C | 5. A |
| 6. D | 7. B | 8. A | 9. C | 10. A |
| 11. C | 12. B | 13. A | 14. A | 15. A |

Review Questions

1. What are the basic steps required to set up Gulp?
2. What are Task Runners in GulpJS?
3. What are the differences between gulp or grunt?
4. Why npm is required for gulp? Comment.
5. Why to use gulp?



Further Readings

Bootstrap by Example, Silvio Morato
Learning Bootstrap 4, Matt Lambert
Bootstrap in 24 Hours, By Sams
Jump Start Bootstrap,



Web Links

<https://www.npmjs.com/>

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