**MODULE: 6 (Bootstrap Basic & Advance)**

**1.What are the advantages of Bootstrap?**

**Ans.** Bootstrap is an open-source CSS framework designed to come up with mobile-friendly, responsive front-end web development. It consists of enormous versatile and reusable pieces of code written in HTML, JavaScript, and CSS. As a framework, fundamentals are already placed for responsive web development, and developers simply need to position the code in a premeditated grid system. Therefore, while coming up with a new website or application, Bootstrap is a boon because it waives off the burden of coding from scratch. You can efficiently blend its ready-made coding blocks, CSS-Less functionality, and cross-browser compatibility to save tedious hours of coding.

Due to this whole concept, web designing in a limited period is a reality. Besides, it is equipped with free tools, which helps build some common website interface components, thus adding to the adaptability of the framework.

**The Benefits of Using Bootstrap Framework**

Using the Bootstrap framework saves time in many ways by taking advantage of reusable code for Navbars, Dropdowns, Labels, Alerts, List groups and JavaScript plugins. Using the framework offers these design benefits:

Easy to prevent repetitions among multiple projects

Responsive design that can be used to adapt screen sizes and choose what shows and what doesn’t on any given device

Maintaining consistency among projects when using multiple developer teams

Quick design of prototypes

Cross-browser compatibility

**Access to a Vast Open Source Community of resources**

There is a vast community of open source developers who contribute regularly to Bootstrap. That means someone is almost always available to answer questions and troubleshoot problems 24/7. If there’s a potential issue, it’s likely someone has already encountered it and solved the problem. This means that there will be few design issues to slow down the development process. It’s easy for outside developers and consultants to use Bootstrap in collaborative projects because the platform is free and universally available.

**The Benefits of Bootstrap Front-end Development**

Bootstrap offers a vast selection of plugins and components from the open source community, so it just takes a few clicks to begin using your front-end resource. Staff members can save many hours that are usually needed for repetitive coding. The benefits of the Bootstrap framework include:

**Consistent Designs**

Bootstrap was developed with consistency in mind because a group of Twitter employees wanted to create a framework to foster consistency across web pages and internal applications.

**Access to Support**

The open source community is available to help you troubleshoot problems and bugs. Bootstrap is continually being updated and maintained on GitHub with more than 5,000 expert contributors. [2]

**Fast Development**

Today’s B2B and B2C marketing needs are often time-sensitive, and a fast development option is essential to compete against other agile companies. Bootstrap enables designers to build new web pages or websites quickly using pre-existing blocks of code.

**Responsive Business Actions**

Global mobile marketing increased 1,100 percent between 2013 and 2015. [3] Responsive projects are often needed to capitalize on market opportunities. Bootstrap comes preloaded with a 12-column grid system that makes it easy to design for different screen sizes, and developers can choose to show or hide each section of the grid for particular operating systems. This responsiveness speeds the development of custom screen displays for fast mobile marketing.

**Customizable Expansion**

Companies aren’t stuck with one-size-fits-all limitations. Bootstrap can be customized in many ways to build websites with different specifications than the original. It’s easy to discard code that’s not needed. Bootstrap can be customized to meet the needs of each project. Developers just need to determine which aspects are needed on the Bootstrap customize page. It’s easy to tick off the things that aren’t needed such as grid system, forms, tables, buttons, badges, pagination and JavaScript components. This effort creates a custom version of Bootstrap for each project.

**Loaded JavaScript Components**

Loaded Bootstrap comes loaded with a pack of JavaScript components that make it easy to open modal windows, trigger alerts, etc. These components can be used or discarded.

**Easy to Integrate**

Bootstrap flexibility includes easy integration into the platform’s API layer. Designs can work in harmony with pre-existing pages, websites, applications and operating software.

The benefits of Bootstrap include creating remarkable designs in record time to capitalize on business opportunities, refresh company websites regularly and reduce development costs.

**2.** **What is a Bootstrap Container, and how does it work?**

**Ans.** BootstrapContainers are the most basic layout element in Bootstrap. Bootstrap **Containers**are very essential and basic building blocks of bootstrap that wrap a page’s content. It’s responsible for setting and aligning content within it according to viewport or given device. Containers are defined within the container class **(.container)**. In other words, we can say that containers are established the width for the layout to give the content. Elements and content are added within the container.

**Containers are used for many purposes such as –**

* It requires use with the default grid system.
* To establish width for the layout to give web content.
* To provide responsive fixed behavior of any web project.
* To sets the content margin dealing with the responsive behavior of your layout.

Basically, there are three types of container classes available in bootstrap:

1. Default-Container(container)
2. Responsive-Container(along with sm, md, lg, xl, xxl)
3. Fluid-Container(container-fluid)

**1. Default-Container:** The default container uses ‘.container’ class. It provides a responsive fixed-width container.

**Syntax:**

<div class="container">

<!-- Content here -->

</div>

**2. Responsive-Container:**Responsive containers are responsive in nature. Responsive containers allow you to specify a class that is wide until the specified breakpoint is reached, after which we apply max-widths for each of the higher breakpoints.

**Syntax:**

<div class="container-sm">Wide for small breakpoint</div>

<div class="container-md">Wide for medium breakpoint</div>

<div class="container-lg">Wide for large breakpoint</div>

<div class="container-xl">Wide for extra large breakpoint</div>

<div class="container-xxl">Wide for extra large breakpoint</div>

**3. Fluid-Container:**Fluid-container uses the ‘.container-fluid’ class. It is used for a full-width container, spanning the entire width of the viewport.

**Syntax:**

<div class="fluid-container">

<!-- Content here -->

</div>

**Example-1:-** In this example,  we will see how to use the default container **‘.container”** class in bootstrap and know how it’s used along within a webpage.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class="container"

        style="background-color: yellow;">

        <h1>Default-Container</h1>

        <p>

            This is the example of

            container in bootstrap

        </p>

    </div>

</body>

</html>

**Output:-**



**Example 2:**In this example, we will see the example of responsive-container uses like ‘.container-sm’ etc., class in bootstrap, and know how it’s used along within a webpage.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class=" container container-sm"

        style="background-color: green;">

        <h1>Responsive-Container</h1>

        <p>

            This is the example of

            container in bootstrap

        </p>

    </div>

</body>

</html>

**Output:-**

****

**Example 3:**In this example,  we will see the use of fluid-container ‘.container-fluid” class in bootstrap and know how it’s used along within a webpage.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class=" container-fluid"

        style="background-color: blue;">

        <h1>Fluid-Container</h1>

        <p>

            This is the example of

            container in bootstrap

        </p>

    </div>

</body>

</html>

**Output:-**

****

**3.What are the default Bootstrap text settings?**

**Ans.** Bootstrap 4 Default Settings

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).

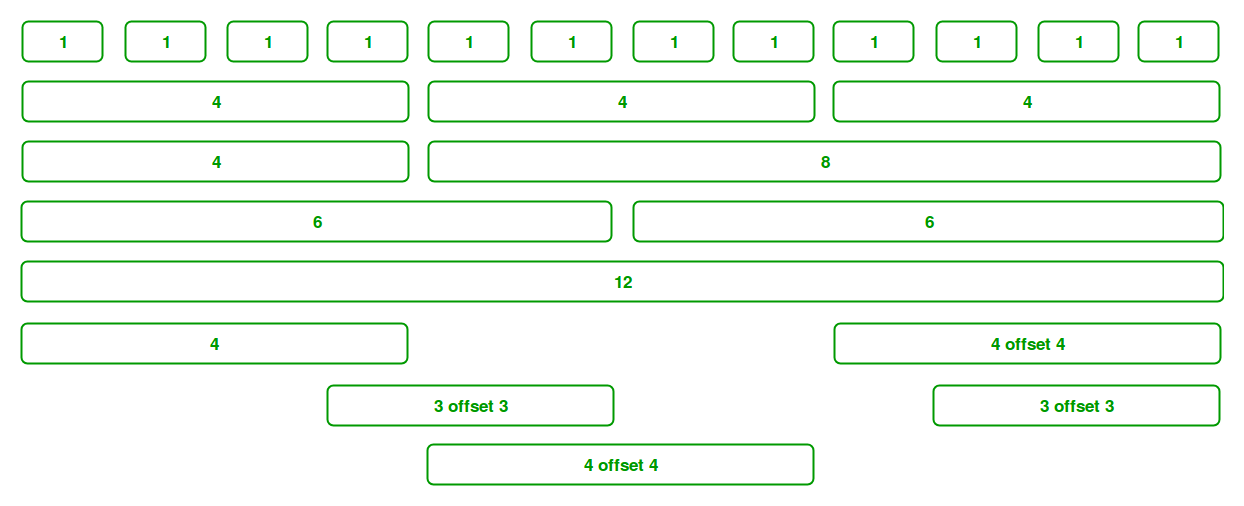
**4.What do you know about the Bootstrap Grid System?**

## **Ans. Bootstrap Grid System**

1. [Introduction and Installation](https://www.geeksforgeeks.org/beginning-bootstrap-part-1/)
2. [Buttons, Glyphicons, Tables](https://www.geeksforgeeks.org/bootstrap-part-3/)
3. [Vertical Forms, Horizontal Forms, Inline Forms](https://www.geeksforgeeks.org/bootstrap-part-4/)
4. [DropDowns and Responsive Tabs](https://www.geeksforgeeks.org/bootstrap-part-5/)
5. [Progress Bar and Jumbotron](https://www.geeksforgeeks.org/bootstrap-part-6-progress-bar-jumbotron/)

**Prerequisites:** [Web Development Basics](https://www.geeksforgeeks.org/begin-web-development-with-a-head-start/) and [BootStrap (Part-1)](https://www.geeksforgeeks.org/beginning-bootstrap-part-1/)

**Grid System:** In the previous article we had learnt about Bootstrap and its Installation.However, from this article, we are going to start with learning Bootstrap. We are going to talk about the **Bootstrap Grid System**in this article.

**Grid System:** Bootstrap Grid System allows up to 12 columns across the page. You can use each of them individually or merge them together for wider columns. You can use all combinations of values summing up to 12. You can use 12 columns each of width 1, or use 4 columns each of width 3 or any other combination.[](https://media.geeksforgeeks.org/wp-content/uploads/Bootstrap-part-2.png)

**Grid Classes:** The Bootstrap grid system has four classes that can be combined to make more flexible layouts:

* **xs (<576px):** For Portrait Mobile Phones.
* **sm (>=576px):** For Landscapes phones
* **md (>=768px):** For Tablets/Phablets
* **lg (>=992px):** For Small-sized Desktops/Laptops
* **xl (>=1200px):** For Larger-sized Desktops/Laptops

**Note:** Output can be little difference as shown, it depend on your screen size.

**Components of Grid System:** We will be learning the Components of the Grid system one-by-one:

1. **Containers**: Bootstrap requires a containing element to wrap site contents and house our grid system. The word ‘container’ is a container of row elements and row elements are ‘containers’ of the column elements. You will understand it more in the latter part of the article where we have dealt with columns.

Use ‘container’ for a responsive fixed width container and use ‘container-fluid’ for a full width container, spanning the entire width of your viewport.

**Example:**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <header>

        <div class="container">

            <h1 style="color: green">Tops Technologies</h1>

            <strong>A computer Science portal for Tops</strong>

        </div>

    </header>

    <footer>

        <hr/>

        <div class="container">

            <p>

                <a href=" https://www.tops-int.com/">

                    Visit

                </a>

                our website

            </p>

            <p>

                <a href="https://www.facebook.com/TOPSTech/">

                    Like

                </a>

                us on facebook

            </p>

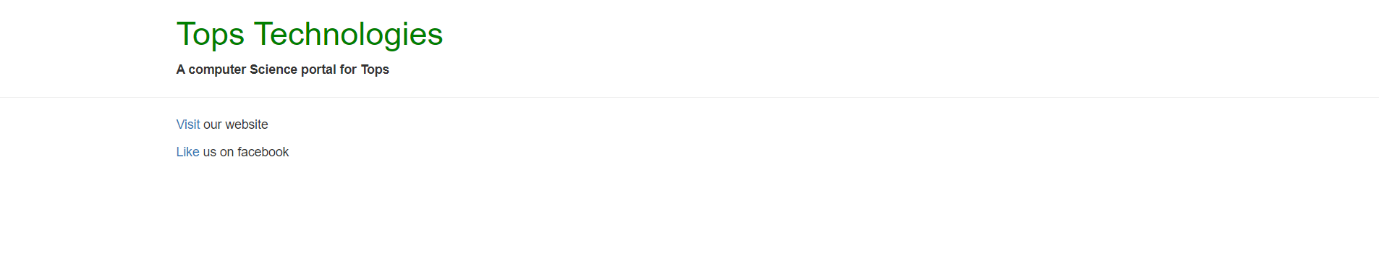
        </div>

    </footer>

</body>

</html>

**Output:-**

****

**Note:** The <div> tag defines a division or a section in an HTML document. The <div> tag is used to group block-elements to format them with CSS.

**Rows:** Rows must be placed within a ‘container’ or ‘container-fluid’ for proper alignment and padding. We use rows to create horizontal groups of columns.  
**Example:**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <header>

        <div class="container">

            <h1 style="color: green">Tops Technologies</h1>

            <strong>

                A computer Science portal for Tops

            </strong>

        </div>

    </header>

    <div class="container">

        <div class="row">

            <div class="bg bg-primary w-100">

                First row

            </div>

        </div>

        <div class="row">

            <div class="bg bg-success w-100">

                Second row

            </div>

        </div>

        <div class="row">

            <div class="bg bg-primary w-100">

                Third row

            </div>

        </div>

        <div class="row">

            <div class="bg bg-success w-100">

                Fourth row

            </div>

        </div>

        <div class="row">

            <div class="bg bg-primary w-100">

                Fifth row

            </div>

        </div>

    </div>

    <footer>

        <hr />

        <div class="container">

            <p>

                <a href="https://www.tops-int.com/">

                    Visit

                </a>

                our website

            </p>

            <p>

                <a href="https://www.facebook.com/TOPSTech/">

                    Like

                </a>

                us on facebook

            </p>

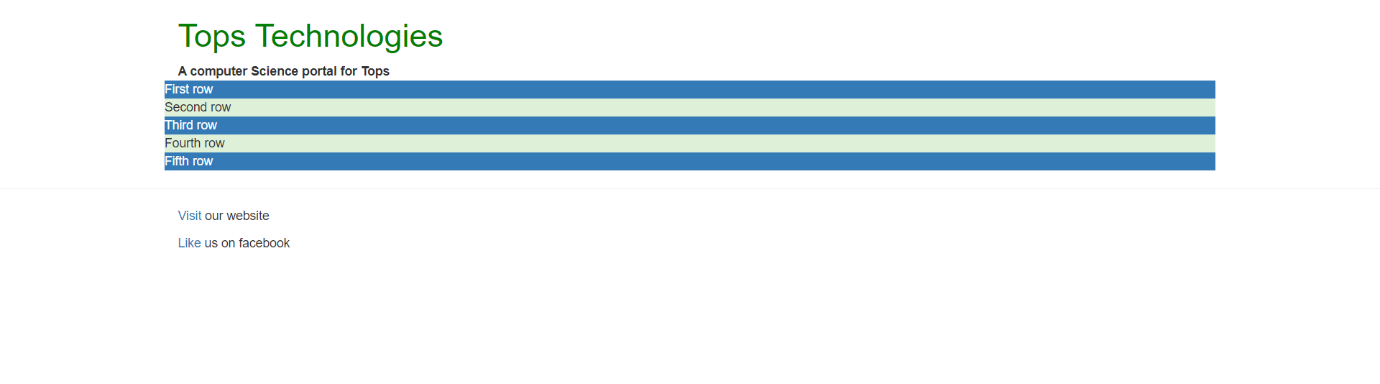
        </div>

    </footer>

</body>

</html>

**Output:-**



**5.What is the difference between Bootstrap 4 and Bootstrap 5**

**Ans.**

**Difference between Bootstrap 4 and Bootstrap 5**

| **BASIS OF** | **BOOTSTRAP 4** | **BOOTSTRAP 5** |
| --- | --- | --- |
| **Grid System** | It has 5 tier (xs, sm, md, lg, xl). | It has 6 tier (xs, sm, md, lg, xl, xxl). |
| **Color** | It has limited colors. | Extra colors added with the looks, A card improved color palette. there are various shades available to choose. |
| **Jquery** | It has jquery and all related plugins. | Jquery is removed and switched to vanilla JS with some working plugins |
| **Internet Explorer** | Bootstrap 4 supports both IE 10 and 11. | Bootstrap 5 doesn’t support IE 10 and 11. |
| **Form elements** | Radio buttons, checkboxes have different look in different OS and browsers. The form uses whatever default browsers provide. | The look of form elements will not change, on different OS or browser. The forms can be customized and form controls can be added, they would not depend on browser. |
| **Utilities API** | We cannot modify utilities in bootstrap 4 | Bootstrap 5 gave freedom to modify and also create our own utility |
| **Gutter** | We use .glutter with fontsize in px | We use .g\* with fontsize in rem |
| **Vertical Classes** | Columns can be positioned relative | Columns cannot be positioned relative |
| **Bootstrap Icons** | Bootstrap 4 doesn’t have its own SVG icons, we have to use font-awesome for icons. | Bootstrap 5 have its own SVG icons |
| **Jumbotron** | It supports. | It doesn’t support jumbotron. |
| **Card deck** | The card deck is used to create an isset of cards with equal width and height. | Card deck class in removed in bootstrap |
| **Navbar** | We have inline-block property and we will get white dropdown as default for dropdown-menu-dark class. | Inline-block property is removed and we will get black dropdown as default for dropdown-menu-dark class. |
| **Static Site Generator** | Bootstrap 4 uses Jekyll software. | Bootstrap 5 uses Hugo software as it is fast static site generator. |
| **flexbox grid** | this makes easier to implement vertical designs, and the columns and rows can easily be implemented. the classes justify-center-content can directly be used to align according to the requirement. | advanced grid system is made available , also columns don’t have relative positions. |
| **RTL Support** | It does not enable RTL(Right to Left) switching. | It enables RTL(Right to Left) switching. |
| **Offcanvas Component** | It does not support Offcanvas Component. | It supports Offcanvas Component(that is it is available now). |

1. **What is a Button Group, and what is the class for a basic Button Group?**

**Ans.**

“Button Groups” in Bootstrap is a class of name “btn-group” which is used to create series of buttons in groups (without spaces) vertically or horizontally.

This is the basic syntax of the button group class where each button has its own class of “btn”.

<div class="btn-group">

<button type="button" class="btn">Click</button>

</div>

Buttons have a default border-radius on the first and last buttons of the group.

**Adding Styles on Buttons:**Bootstrap allows you to add styles to your buttons using the following classes:

* .btn-default
* .btn-primary
* .btn-success
* .btn-info
* .btn-warning
* .btn-danger
* .btn-link

**Example:**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class="btn-group">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

</body>

</html>

**Output:-**

****

**Sizing of your Buttons:**Bootstrap provides 4 button sizes which you can add directly to your buttons by adding an additional class of “btn-group-\*” to your “btn-group” class. No need to add separate classes to each button.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class="btn-group btn-group-lg">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

    <div class="btn-group">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

    <div class="btn-group btn-group-sm">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

    <div class="btn-group btn-group-xs">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

</body>

</html>

**Output:-**

****

**Vertical Button Groups:**Bootstrap also supports vertical button groups stacked in a vertical manner rather than horizontal. Use the class “btn-group-vertical” to create a vertical button group:

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link rel="stylesheet" href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css">

    <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>

</head>

<body>

    <div class="btn-group-vertical">

        <button type="button" class="btn btn-danger">Click</button>

        <button type="button" class="btn btn-warning">Click</button>

        <button type="button" class="btn btn-success">Click</button>

    </div>

</body>

</html>

**Output:-**

****

**Nesting of Buttons:**Bootstrap allows you to create dropdown menus under your buttons through nesting. Add a class of  “btn-group” within your main “btn-group” class to have a dropdown menu within your button:

1. **How can you use Bootstrap to make thumbnails?**

**Ans.**

[Bootstrap](https://www.geeksforgeeks.org/bootstrap-tutorials/)helps web developers to create thumbnails that are used to show linked images in grids with the pre-defined classes which help to reduce codes length. Thumbnails are created to provide a quick preview of images with small images.

**Thumbnail Image:**A thumbnail is a small image that represents a larger image. Bootstrap has an easy way to do this with thumbnails. Bootstrap’s *.thumbnail*class is used to show linked images in grids ([grid system](https://www.geeksforgeeks.org/bootstrap-4-grid-system/)), a thumbnail is created using class *.thumbnail* within the element [<a>](https://www.geeksforgeeks.org/html-a-tag/#:~:text=HTML%20Tag,-Difficulty%20Level%20%3A%20Basic&text=The%20tag%20(anchor,as%20its%20%E2%80%9Chref%E2%80%9D%20value.).  The class *.col-sm-\**and *.col-md-\** (where \* represent number ), it is used to create grids of the images.

**Step by step guide for the implementation:**

**Step 1:** Include Bootstrap and jQuery CDN into the <head> tag before all other stylesheets to load our CSS.

*<link rel=”stylesheet” href=”http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css”>   
<script src=”https://ajax.googleapis.com/ajax/libs/jquery/1.12.0/jquery.min.js”></script>   
<script src=”http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/js/bootstrap.min.js”></script>*

**Step 2:** Add [<div>](https://www.geeksforgeeks.org/div-tag-html/#:~:text=The%20div%20tag%20is%20used,%2C%20navigation%20bar%2C%20etc).&text=It%20is%20used%20to%20the,can%20be%20applied%20to%20them.) tag in the HTML body with class row. In that <div> create four *div*sections to create four images.

**Step 3:** Add “col-sm-6” and “col-md-3” to four *div* sections which creates webpage responsive.

**Step 4:** Add [<a>](https://www.geeksforgeeks.org/html-a-tag/) tag with class value *thumbnail*to define the link of the image in the next line.

<a href="#" class="thumbnail">

**Example 1:**The following example shows the creation of thumbnails images.

<!DOCTYPE html>

<html lang="en">

<head>

    <title>Thumbnail images</title>

    <link

    rel="stylesheet"

    href=

"http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css"/>

    <script src=

"https://ajax.googleapis.com/ajax/libs/jquery/1.12.0/jquery.min.js">

    </script>

    <script src=

"http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/js/bootstrap.min.js">

    </script>

</head>

<body>

    <h3 style="color: green">Bootstrap thumbnails</h3>

    <div class="row">

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://www.nato.int/nato\_static\_fl2014/assets/pictures/images\_mfu/2020/6/stock/200612-dsg-workshop.jpg"

            style="height: 100px; width: 100px"/>

        </a>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://blog.vantagecircle.com/content/images/2020/08/technology-in-the-workplace.png"

            style="height: 100px; width: 100px"/>

        </a>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSAGEYGzHea6VYaypGpb\_le6fKkVjeVKR01mA&usqp=CAU"

            style="height: 100px; width: 100px"/>

        </a>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQpQQKuJAtMkiUzoRYYkJ530mDRuOhXDaDQQTyd55Fgq17cT\_bZmsu-EPUfMxhLbZ51OKU&usqp=CAU"

            style="height: 100px; width: 100px"/>

        </a>

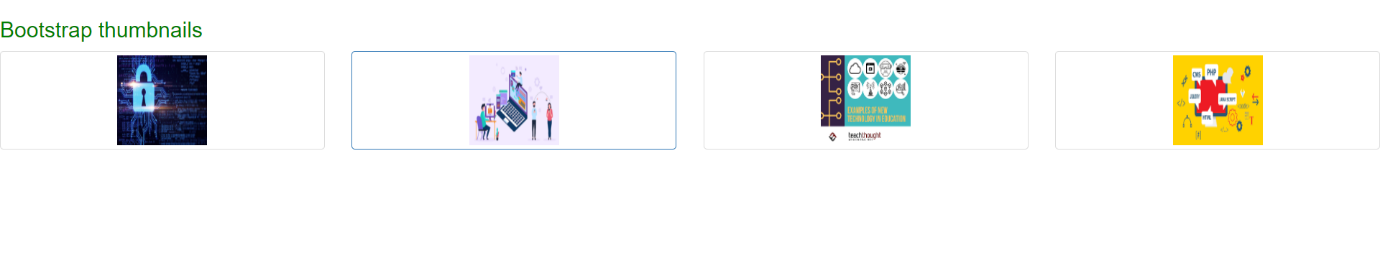
    </div>

    </div>

</body>

</html>

**Output:-**

****

**Adding captions and buttons to the thumbnails :**

**Step 1:** We created *div*with class value as *thumbnail*and inserted image, after that add *div* with class*.caption* to define the description of the images <p>.

**Step 2:** Create buttons using <a> tag with class *. btn .btn-success*.

**Example:**The following example demonstrates adding of caption and button to the thumbnails.

<!DOCTYPE html>

<html lang="en">

<head>

    <link

    rel="stylesheet"

    href=

"http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css"/>

    <script src=

"https://ajax.googleapis.com/ajax/libs/jquery/1.12.0/jquery.min.js">

    </script>

    <script src=

"http://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/js/bootstrap.min.js">

    </script>

</head>

<body>

    <h3 style="color: green">

    <b>Bootstrap Thumbnails with Captions and Button</b>

    </h3>

    <div class="row">

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://www.nato.int/nato\_static\_fl2014/assets/pictures/images\_mfu/2020/6/stock/200612-dsg-workshop.jpg"

            style="height: 100px; width: 100px"/>

        </a>

        <div class="caption">

        <h3 style="color: green">Web-Development</h3>

<p>

            Web development refers to the building,

            creating, maintaining of

            websites.

        </p>

<p>

            <a href="#" class="btn btn-success">

            Learn More

            </a>

        </p>

        </div>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://blog.vantagecircle.com/content/images/2020/08/technology-in-the-workplace.png"

            style="height: 100px; width: 100px"/>

        </a>

        <div class="caption">

        <h3 style="color: green">Machine Learning</h3>

<p>

            Machine Learning is the study to

            learn without being explicitly

            programmed.

        </p>

<p>

            <a href="#" class="btn btn-success">

            Learn More

            </a>

        </p>

        </div>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSAGEYGzHea6VYaypGpb\_le6fKkVjeVKR01mA&usqp=CAU"

            style="height: 100px; width: 100px"/>

        </a>

        <div class="caption">

        <h3 style="color: green">Programming</h3>

<p>

            Competitive Programming enables you

            to code a given problem under

            provided constraints.

        </p>

<p>

            <a href="#" class="btn btn-success">

            Learn More

            </a>

            </p>

        </div>

    </div>

    <div class="col-sm-6 col-md-3">

        <a href="#" class="thumbnail">

        <img src="https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQpQQKuJAtMkiUzoRYYkJ530mDRuOhXDaDQQTyd55Fgq17cT\_bZmsu-EPUfMxhLbZ51OKU&usqp=CAU"

            style="height: 100px; width: 100px"/>

        </a>

        <div class="caption">

        <h3 style="color: green">Java</h3>

<p>

            Java is one of the most popular

            and widely used programming

            language.

        </p>

<p>

            <a href="#" class="btn btn-success">

            Learn More

            </a>

        </p>

        </div>

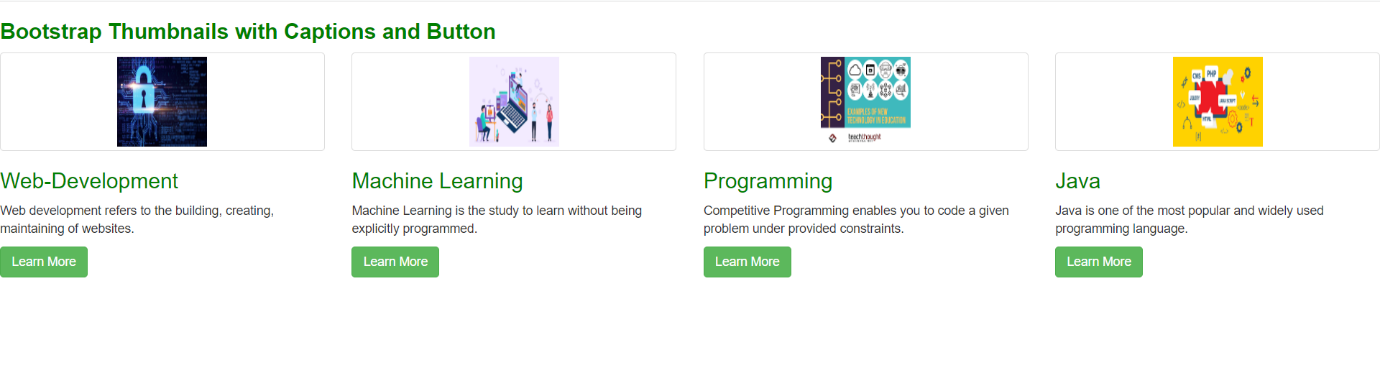
    </div>

    </div>

</body>

</html>

**Output:-**

****

1. **In Bootstrap 4, what is flexbox?**

**Ans.**

[Bootstrap 4](https://www.javatpoint.com/bootstrap-4)

Use flex classes to control the layout of Bootstrap 4 components.

The biggest difference between Bootstrap 3 and Bootstrap 4 is that Bootstrap 4 now uses flexbox, instead of floats, to handle the layout.

The Flexible Box Layout Module, makes it easier to design flexible responsive layout structure without using float or positioning.

<! DOCTYPE html>

<html lang="en">

<head>

  <title> Bootstrap 4 vertical Flex Box Example </title>

  <meta charset="utf-8">

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

  <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"> </script>

  <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"> </script>

  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"> </script>

</head>

<style>

h2 {

  position: relative;

  padding: 10;

  margin: 10;

  font-family: "Raleway", sans-serif;

  font-weight: 300;

  font-size: 40px;

  color: white;

  text-align: center;

  -webkit-transition: all 0.4s ease 0s;

  -o-transition: all 0.4s ease 0s;

  transition: all 0.4s ease 0s;

}

body {

    background-size: 400% 400%;

           margin: 2rem;

background: linear-gradient(-45deg, #ee7752, #e73c7e, #23a6d5, #23d5ab);

    animation: gradient 15s ease infinite;

    height: 100vh;

}

@keyframes gradient {

    0% {

        background-position: 0% 50%;

    }

    50% {

        background-position: 100% 50%;

    }

    100% {

        background-position: 0% 50%;

    }

}

</style>

<body>

<div class="container mt-3">

  <h2> Bootstrap 4 Vertical Direction flexbox </h2>

  <p> Use .flex-column-reverse to reverse the vertical direction: </p>

  <div class="d-flex flex-column-reverse">

    <div class="p-2 bg-info"> Flex item 1 </div>

    <div class="p-2 bg-warning"> Flex item 2 </div>

    <div class="p-2 bg-primary"> Flex item 3 </div>

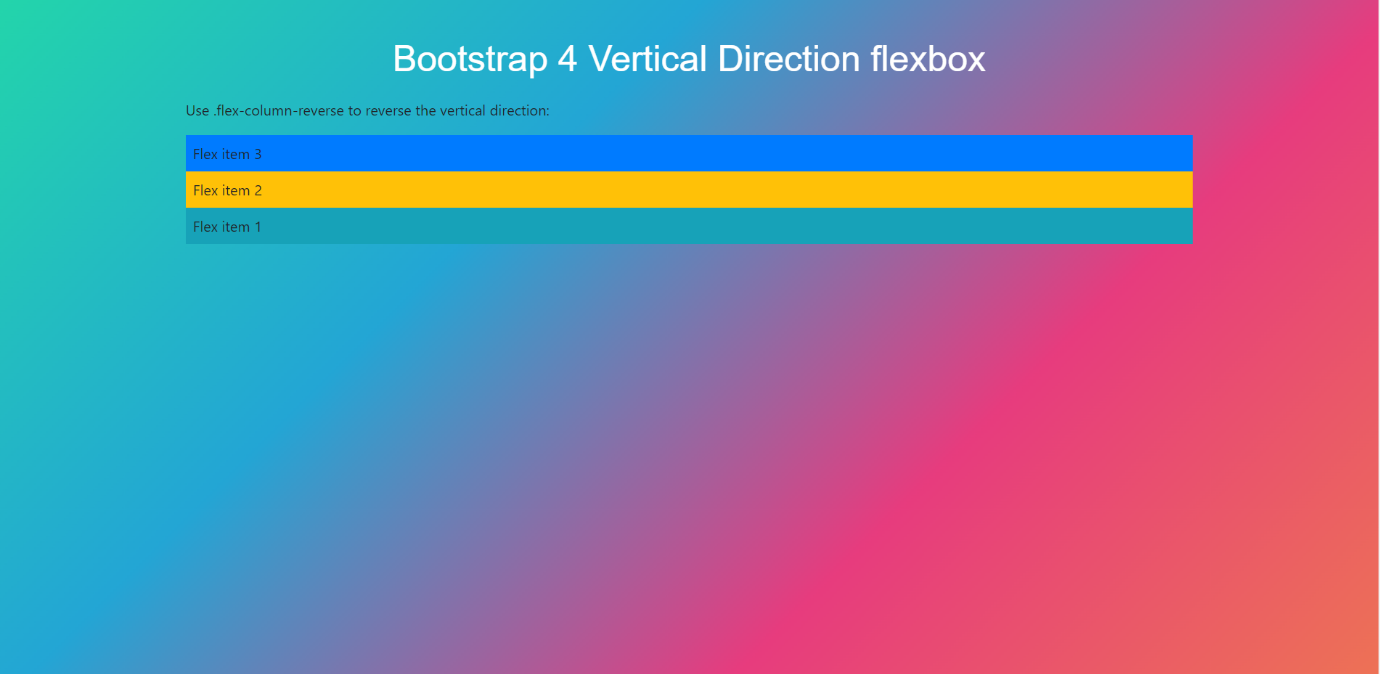
  </div>

</div>

</body>

</html>

**Output:-**

****

1. **How can one create an alert in Bootstrap?**

**Ans.**

**Approach:** The .alert class followed by contextual classes are used to display the alert message on website. The alert classes are: .alert-success, .alert-info, .alert-warning, .alert-danger, .alert-primary, .alert-secondary, .alert-light and .alert-dark. We can use .alert-warning to create warning notification alerts in bootstrap.

Below is the procedure to implement a simple warning alert in Bootstrap.

**Step 1:**Include Bootstrap and jQuery CDN into the <head> tag before all other stylesheets to load our CSS.

*<link rel=”stylesheet” href=”https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css”>  
<script src=”https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js”></script>  
<script src=”https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js”></script>  
<script src=”https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js”></script>*

**Step 2:** Add the .alert and the warning alert contextual classes (e.g., .alert-warning).

<div class="alert alert-warning" role="alert">

A simple warning alert—check it out!

</div>

**Example 1:** In this example, we will see types of alerts in bootstrap. Users can use any type of warning alert.

<!DOCTYPE html>

<html>

<head>

    <title>Warning Alerts</title>

    <meta charset="utf-8" />

    <link

    rel="stylesheet"

    href=

"https://maxcdn.bootstrapcdn.com/bootstrap/4.1.3/css/bootstrap.min.css"

    />

    <script src=

"https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js">

    </script>

    <script src=

"https://maxcdn.bootstrapcdn.com/bootstrap/4.1.3/js/bootstrap.min.js">

    </script>

</head>

<body>

    <div class="container py-5">

    <h4 class="text-center text-uppercase">

        Bootstrap 5 warning messages

    </h4>

    <h6>Basic Warning alert</h6>

    <div class="alert alert-warning">

        <strong>Warning!</strong>

        There was a problem with connection.

    </div>

    <h6>Warning alert with link</h6>

    <div class="alert alert-warning">

        <strong>Warning!</strong>

        There was a problem with wifi connection<a

        href="#"

        class="alert-link">

        Contact us</a>.

    </div>

    <h6>Warning alert with close button</h6>

    <div class="alert alert-warning">

        <button type="button"

                class="close"

                data-dismiss="alert">

        ×

        </button>

        <strong>Warning!</strong>

        There was a problem with wifi connection.

    </div>

    <h6>Warning alert with close button and fade animation</h6>

    <div class="alert alert-warning alert-dismissible fade show">

        <button type="button"

                class="close"

                data-dismiss="alert">

        ×

        </button>

        <strong>Warning!</strong>

        There was a problem with internet connection.

    </div>

    <h6>Warning alert with heading</h6>

    <div class="alert alert-warning alert-dismissible fade show">

        <button type="button"

                class="close"

                data-dismiss="alert">

        ×

        </button>

        <h5 class="alert-heading">Warning!</h5>

        Wrong credentials.

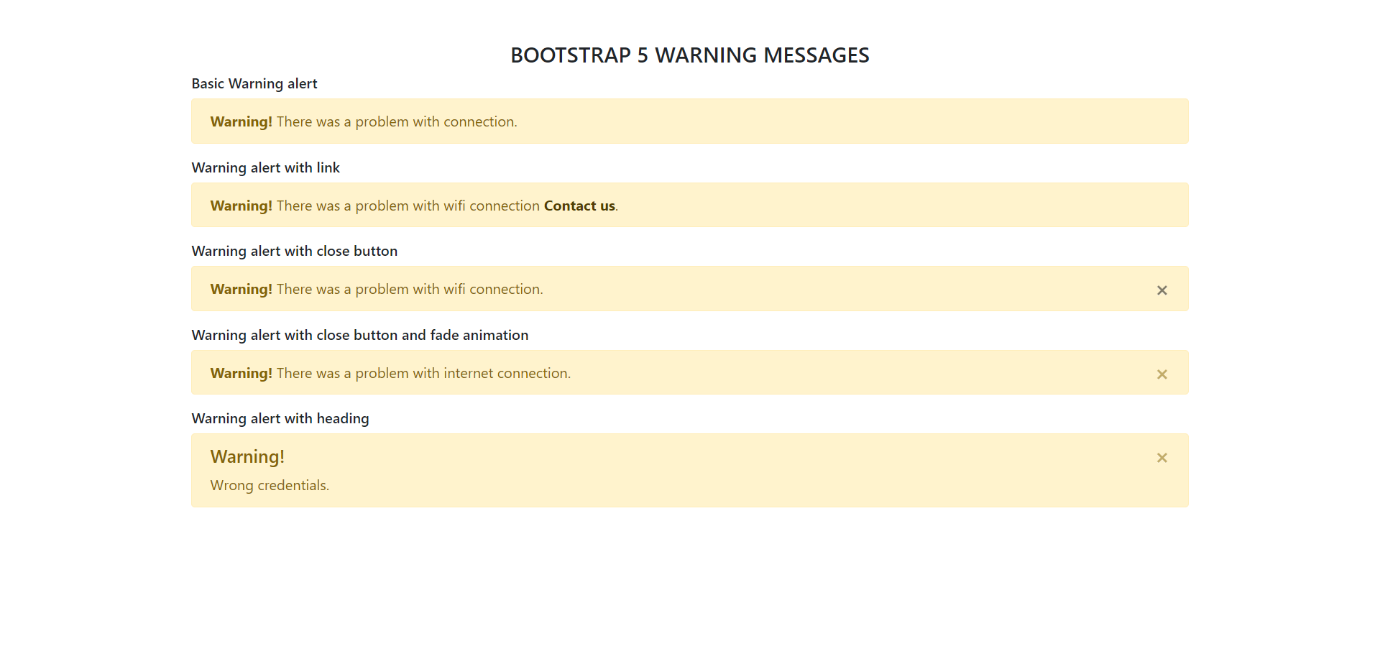
    </div>

    </div>

</body>

</html>

**Output:-**

****

**Example 2:**In this example, we will use the warning alerts using the button click. When the user clicks the button, a warning alert will be generated.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta http-equiv="Content-Type"

        content="text/html; charset=utf-8" />

    <title>Buttons and alerts</title>

    <link href=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.1.1/css/bootstrap.min.css"

        rel="stylesheet">

    <script src=

"https://ajax.googleapis.com/ajax/libs/jquery/1.11.0/jquery.min.js">

    </script>

    <script src=

"https://netdna.bootstrapcdn.com/twitter-bootstrap/2.0.4/js/bootstrap-alert.js">

    </script>

    <script src=

"https://maxcdn.bootstrapcdn.com/bootstrap/3.1.1/js/bootstrap.min.js">

    </script>

    <script type="text/javascript">

        $(document).ready(function () {

            $('#success').click(function (e) {

                e.preventDefault()

                $('#message').html(`

                <div class="alert alert-success fade in">

                    <button type="button class="close close-alert"

                        data-dismiss="alert" aria-hidden="true">

                        ×

                    </button>This is a success message

                </div>`);

            })

            $('#warning').click(function (e) {

                e.preventDefault()

                $('#message').html(`

                <div class="alert alert-warning fade in">

                    <button type="button" class="close close-alert"

                        data-dismiss="alert" aria-hidden="true">

                        ×

                    </button> This is a warning message

                </div>`);

            });

        });

    </script>

</head>

<body>

    <div class="container">

        <h2>Tops Technologies</h2>

        <p class="lead">

            Warning Alert message using bootstrap

        </p>

        <p>

        <form method="post">

            <button type="button"

                class="btn btn-success" id="success">

                Success

            </button>

            <button type="button"

                class="btn btn-warning" id="warning">

                Warning

            </button>

        </form>

        </p>

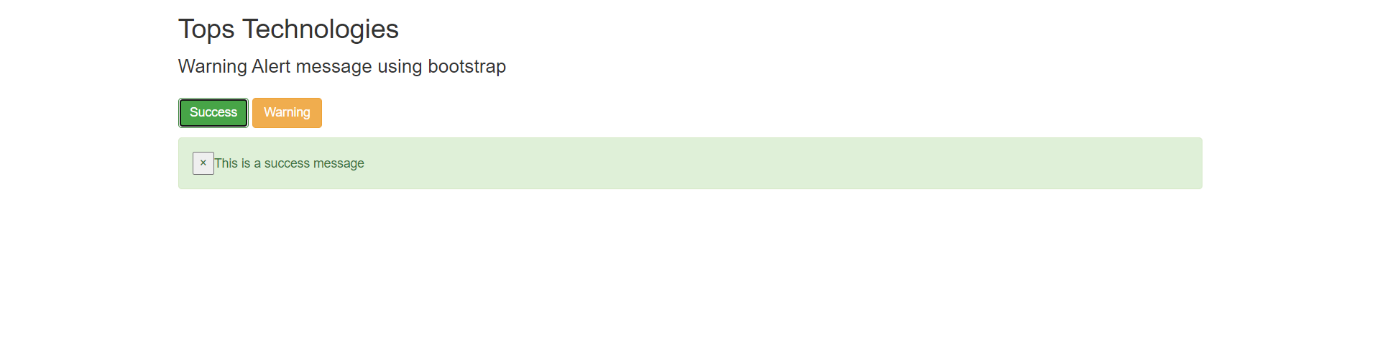
        <div id="message"></div>

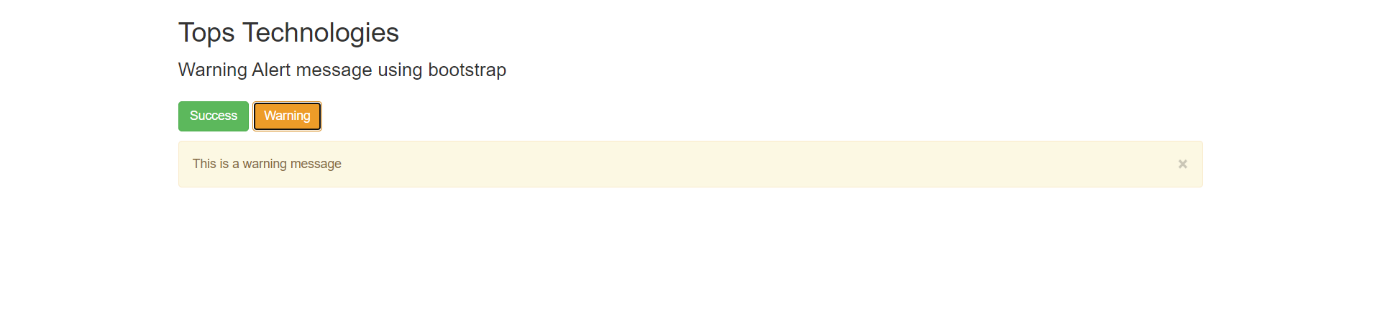
    </div>

</body>

</html>

**Output:-**

****

****

1. **What is a bootstrap card and how would you create one?**

**Ans.** <!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

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

    <title>Document</title>

    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-EVSTQN3/azprG1Anm3QDgpJLIm9Nao0Yz1ztcQTwFspd3yD65VohhpuuCOmLASjC" crossorigin="anonymous">

    <script src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.9.2/dist/umd/popper.min.js" integrity="sha384-IQsoLXl5PILFhosVNubq5LC7Qb9DXgDA9i+tQ8Zj3iwWAwPtgFTxbJ8NT4GN1R8p" crossorigin="anonymous"></script>

<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/js/bootstrap.min.js" integrity="sha384-cVKIPhGWiC2Al4u+LWgxfKTRIcfu0JTxR+EQDz/bgldoEyl4H0zUF0QKbrJ0EcQF" crossorigin="anonymous"></script>

</head>

<body>

    <div class="card" style="width: 18rem;">

        <img src="https://images.moneycontrol.com/static-mcnews/2020/03/Ratan-Tata-HOB-3.jpg?impolicy=website&width=1600&height=900" class="card-img-top" alt="...">

        <div class="card-body">

          <h5 class="card-title">Ratan Tata</h5>

          <p class="card-text">Some quick example text to build on the card title and make up the bulk of the card's content.</p>

          <a href="#" class="btn btn-primary">Go somewhere</a>

        </div>

      </div>

</body>

</html>

**Output:-**

