Web Programming Technologies

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Bootstrap

Responsive Web Designing (RWD)

Responsive Web Designing (RWD) is a process of designing a single website to be used and compatible on different portable or handy electronic devices. Also known as Adaptive Web Designing (AWD)

It regarded as an integrated approach of designing through which compelling and easy to use websites are built, to give an optimal viewing user experience across a wide variety of devices starting from desktop computers to mobile phones

Responsive Websites Offers:

✓ Smooth navigation

✓ Easy reading

✓ Minimum pinching

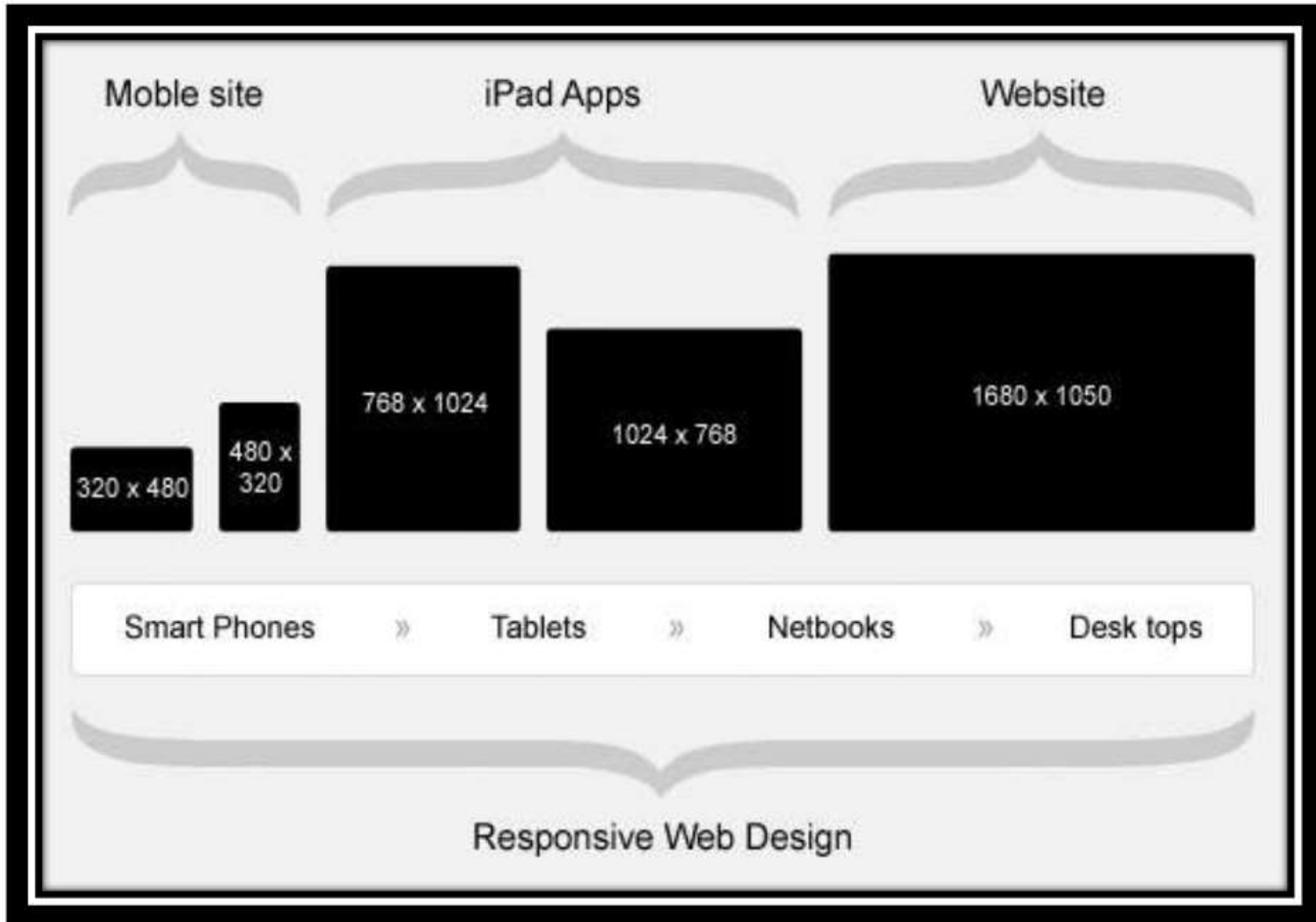✓ Reduces scrolling and zooming.

✓ Excellent user experience.

Need of Responsive Web Design

➢ rowing Demand for Smartphones

➢ Multiple Screen Sizes and Mobile Browsers

➢ Wide Usage of Internet

➢ Permits wider browser support

➢ Compulsory for Getting Good Business

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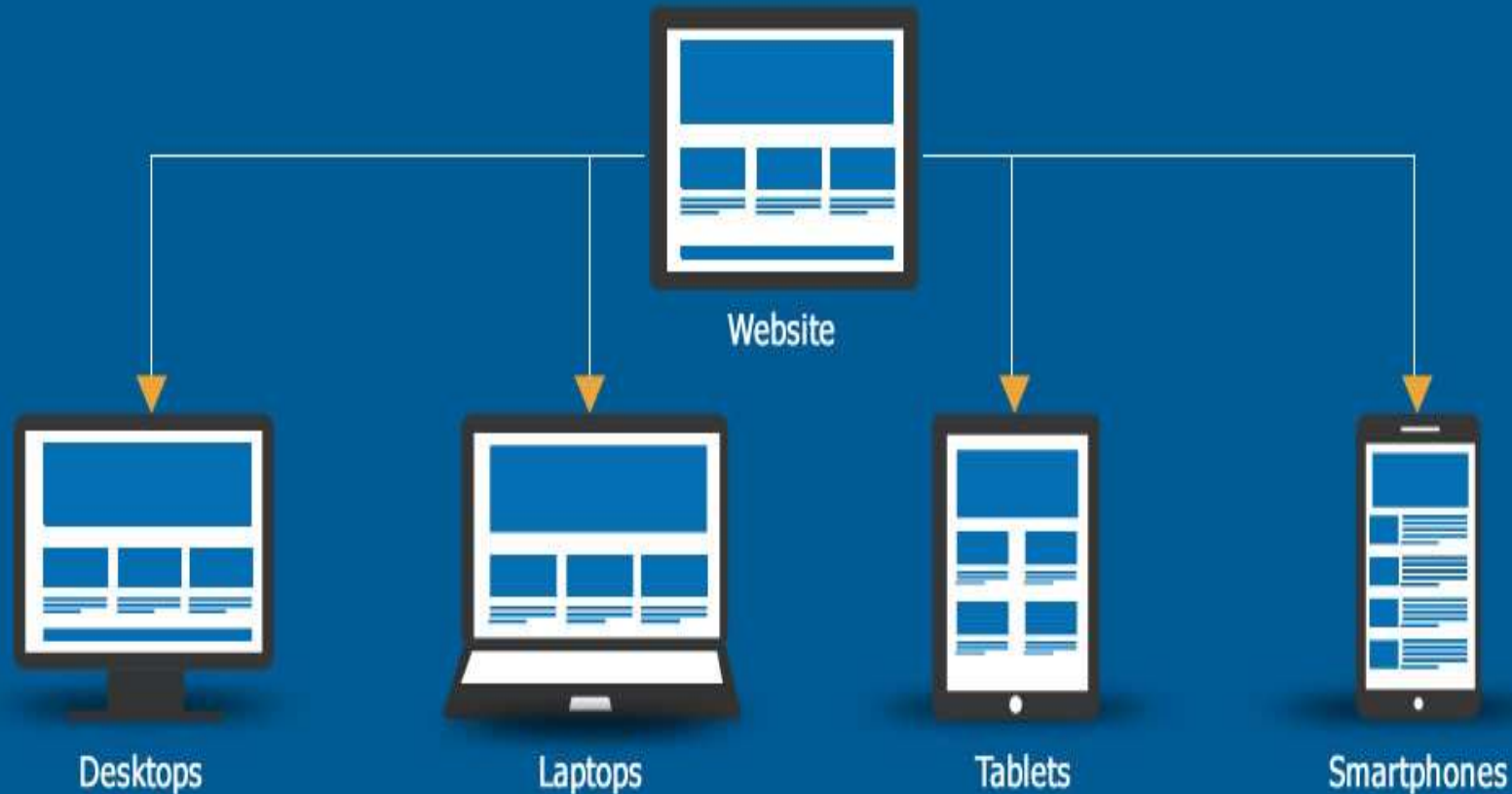
Bootstrap

A freely available design framework for websites

and web applications

 Based upon HTML5, CSS and JavaScript

Released on GitHub in August 2011

Developed by Mark Otto and Jacob Thornton at

Twitter.

Bootstrap is the most popular framework for RAPID WEBSITE PROTOTYPING..

Why use Bootstrap

➢Mobile first approach:

                    Since Bootstrap 3, the 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 a good documentation.

➢Responsive design:

                    Bootstrap's responsive CSS adjusts to Desktops, Tablets and Mobiles.

- **jQuery isn't required anymore** (however you can still use jQuery methods if you wish)
- Dropped support for **Internet Explorer**
- The use if JavaScript is **minimized in favor of CSS (CSS custom properties)**
- Almost each option **is available as data-attribute** (it can be set manually without JS)
- Enhanced **Grid system**
- Enhanced **modularity**
- Enhanced **customization**
- New components/helpers/utilities/variations
- Some components were removed (i.e. Jumbotron)
- Enhanced **Icons** (SVG Icon Library)

There are two ways to start using Bootstrap on your own web site.

➢ **BootstrapCDN** is a free and public *Content Delivery Network*. Users of BootstrapCDN can load CSS, JavaScript and images remotely, from its servers.

<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.0-beta1/dist/css/bootstrap.min.css" rel="stylesheet" >

<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.0-beta1/dist/js/bootstrap.min.js" ></script>

OR

➢ We can download the latest version of Bootstrap from http://getbootstrap.com/.

Once the compiled version Bootstrap is downloaded, extract the ZIP file, and you will see the following file/directory structure:

```
bootstrap/
├── css/
│       ├── bootstrap-grid.css
│       ├── bootstrap-grid.css.map
│       ├── bootstrap-grid.min.css
│       ├── bootstrap-grid.min.css.map
│       ├── bootstrap-reboot.css
│       ├── bootstrap-reboot.css.map
│       ├── bootstrap-reboot.min.css
│       ├── bootstrap-reboot.min.css.map
│       ├── bootstrap.css
│       ├── bootstrap.css.map
│       ├── bootstrap.min.css
│       └── bootstrap.min.css.map
└── js/
        ├── bootstrap.bundle.js
        ├── bootstrap.bundle.js.map
        ├── bootstrap.bundle.min.js
        ├── bootstrap.bundle.min.js.map
        ├── bootstrap.js
        ├── bootstrap.js.map
        ├── bootstrap.min.js
        └── bootstrap.min.js.map
```

Bootstrap grid system is used for creating page layout through a series of rows and columns.
The grid system consists of 12 columns.

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

Bootstrap Grid Classes:

Device	Class
Extra small (<576px)	.col-
Small (≥576px)	.col-sm-
Medium (≥768px)	.col-md-
Large(≥992px)	.col-lg-
Extra large (≥1200px)	.col-xl-
Xxl (≥1400px)	.col-xxl-

```html
<div class="container">
    <div class="row">
        <div class="col-*-*"></div>
        <div class="col-*-*"></div>
    </div>
    <div class="row">...</div>
</div>
<div class="container">....
```

Bootstrap Grid System Example: Medium and Extra Small Device

Here we had used 2 div's and gave them the 50%/50% split at the medium and extra small viewport width:

```
<div class="container">
   <div class="row">
      <div class="col-md-6 col-4">
         <p>div 1...</p>
         <p>lgrid1 ...</p>
            </div>
            <div class="col-md-6 col-8">
         <p>div2...</p>
         <p>grid2...</p>
      </div>
</div>
```

Bootstrap requires a containing element to wrap site contents and house our grid system.

Use .container for a responsive fixed width container.

Use .container-fluid for a full width container, spanning the entire width of your viewport.

```
<div class="container">
    ...
 </div>

 <div class="container-fluid">
    ...
 </div>
```
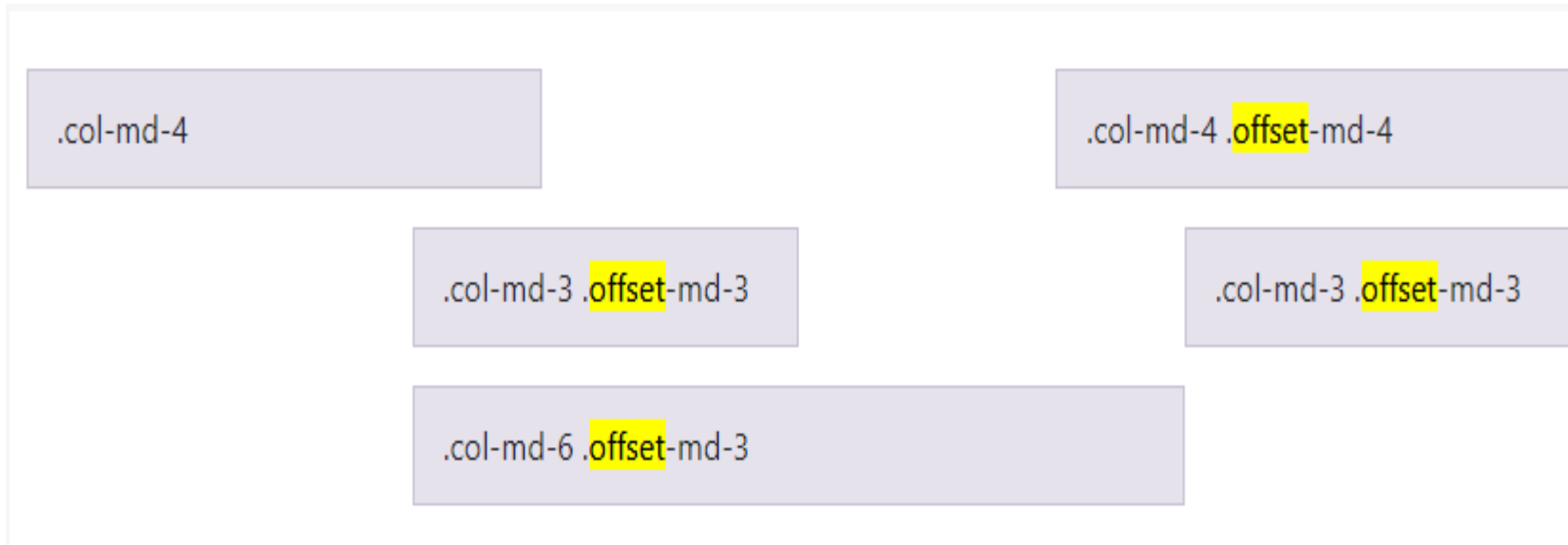
Move columns to the right.
These classes increase the left margin of a column by * columns.

Make it easy to create heading, paragraph, ol, ul, inline element etc. in a way that would be appealing to the users.

```
<span class="h1">H1</span>
<span class="h2">H2</span>
<span class="h3">H3</span>
<span class="h4">H4</span>
<span class="h5">H5</span>
<span class="h6">H6</span>
```

Output: H1 H2 H3 H4 H5 H6

```
<h1>Main Heading 1 <span class="small">Small Heading 1</span></h1>
                        OR
<h1>Main Heading 1 <small>Small Heading 1</small></h1>
```

Output:

Main Heading 1 Small Heading 1

More Typography Classes:

.text-left	Indicates left-aligned text
.text-center	Indicates center-aligned text
.text-right	Indicates right-aligned text
.text-justify	Indicates justified text
.text-nowrap	Indicates no wrap text
.text-lowercase	Indicates lowercased text
.text-uppercase	Indicates uppercased text
.text-capitalize	Indicates capitalized text
.fw-light	Light weight text
.fw-bold	Bold text.
.fst-italic	Italic text

Text Colors:

.text-muted, .text-primary, .text-success, .text-info, .text-warning, .text-danger, .text-secondary, ,.text-dark , .text-light, .text-body, .text-light, .text-white

Background Colors:

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

This text is muted.

This text is important.

This text indicates success.

This text represents some information.

This text represents a warning.

This text represents danger.

Secondary text.

Dark grey text.

Body text.

This text is important.

This text indicates success.

This text represents some information.

This text represents a warning.

This text represents danger.

Secondary background color.

Dark grey background color.

Light grey background color.

Bootstrap classes for styling tables:

Class	Purpose
.table	adds basic styling to a table
.table-striped	adds zebra-stripes to a table
.table-bordered	adds borders on all sides of the table and cells
.table-hover	adds a hover effect (grey background color) on table rows
.table-dark	adds a black background to the table
.table-borderless	removes borders from the table
.thead-dark	adds a black background to table headers
.thead-light	adds a grey background to table headers
.table-sm	makes the table smaller by cutting cell padding in half
.table-responsive	creates a responsive table

Contextual classes to color table rows or individual cells:

Class	Description
.table-primary	Blue: Indicates an important action
.table-success	Green: Indicates a successful or positive action
.table-danger	Red: Indicates a dangerous or potentially negative action
.table-info	Light blue: Indicates a neutral informative change or action
.table-warning	Orange: Indicates a warning that might need attention
.table-active	Grey: Applies the hover color to the table row or table cell
.table-secondary	Grey: Indicates a slightly less important action
.table-light	Light grey table or table row background
.table-dark	Dark grey table or table row background

```html
<div class="table-responsive">
    <table class="table table-bordered table-hover">
        <!--Html code-->
    </table>
</div>
```

Bootstrap Images

Rounded Corners:

Circle:

Thumbnail:

Class	Purpose
.rounded	adds rounded corners to an image
.rounded-circle	shapes the image to a circle
.img-thumbnail	shapes the image to a thumbnail (bordered)
.float-end	Float an image to the right
.float-start	Float an image to the left
.img-fluid	Create responsive image.(applies max-width: 100%; and height: auto; to the image)
.mx-auto .d-block	Center the image

Creating an alert with Bootstrap is easy. All we need to do is create a <div> element with classes alert and one of the following contextual state classes.

.alert-success, .alert-info, .alert-warning, .alert-danger, .alert-primary, .alert-secondary, .alert-light or .alert-dark

alert-link class to any links inside the alert box to create "matching colored links"

.alert-dismissible - To close the alert message, add a class to the alert container. Then add class="close" and data-dismiss="alert" to a link or a button element (when you click on this the alert box will disappear).

```
<div class="alert alert-success alert-dismissible">
  <button type="button" class="btn-close" data-bs-dismiss="alert"></button>
  <strong>Success!</strong> Indicates a successful or positive action.
</div>
```
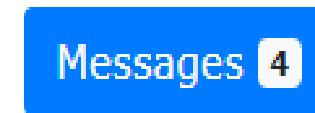
Click on the "x" symbol to the right to close me.   X

Badges are used to add additional information to any content.

Ex:

```
<h1>HTML<span class="badge bg-secondary">New</span></h1>
```

Contextual Badges:

Badge inside an Element

```
<button type="button" class="btn btn-primary">
  Messages <span class="badge bg-light">4</span>
</button>
```

Button Styles:

`.btn,.btn-primary,.btn-secondary,.btn-success,.btn-info,`
`.btn-warning ,.btn-danger,.btn-dark,.btn-light,.btn-link`

Button classes can be used on
`<a>`
`<button>`
`<input type="button">`
`<input type="submit">`

`<button class="btn">Button</button>`

`<p><button class="btn btn-primary">`
`btn-primary</button></p>`

To make an anchor element look like a button, use **btn** class along with the other button classes (like btn-default, btn-primary etc.)

`<a href="#" class="btn btn-info" role="button">Link Button</a>`

Button Outline:

.btn-outline-primary,. btn-outline-secondary,. btn-outline-success,. btn-outline-info,. btn-outline-warning,. btn-outline-danger,. btn-outline-dark,. btn-outline-light

Block Level Buttons:
<div class="d-grid gap-2">
<button class="btn btn-primary" type="button">Button</button>
</div>

Active/Disabled Buttons: .active, .disabled

Button Sizes: .btn-lg, .btn-sm

Bootstrap Button Group

Bootstrap allows you to group a series of buttons together (on a single line) in a button group.

```
<div class="btn-group">
  <button type="button" class="btn btn-primary">Button1</button>
  <button type="button" class="btn btn-primary">Button2</button>
  <button type="button" class="btn btn-primary">Button3</button>
</div>
```

.btn-group-lg|sm can also used to size all the buttons in the group.

.btn-group-vertical to create a vertical button group.

Cards

A card in Bootstrap 4 is a bordered box with some padding around its content. It includes options for headers, footers, content, colors, etc.


```html
<div class="card">

  <div class="card-header">Header</div>

  <div class="card-body">Content</div>

  <div class="card-footer">Footer</div>

</div>
```
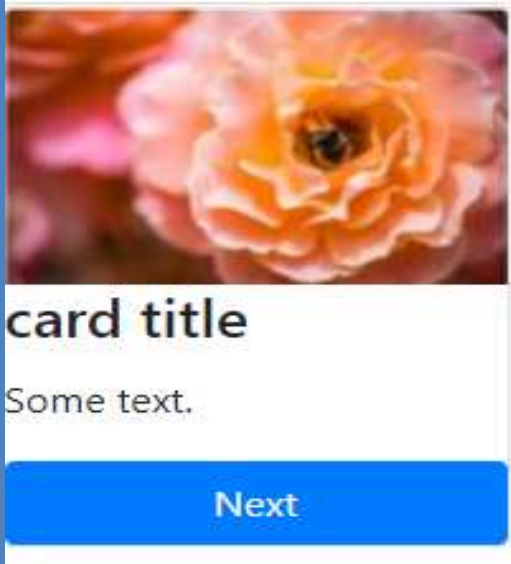
.card-title: add card titles to any heading element.
.card-text: used to remove bottom margins for a <p> element if it is the last child (or the only one) inside .card-body.
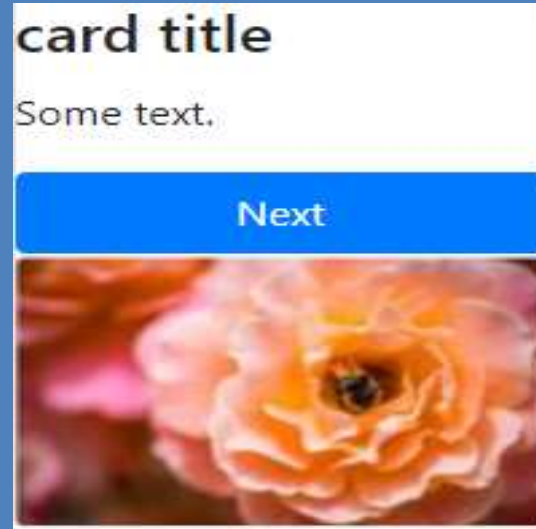.card-link class adds a blue color to any link, and a hover effect.

.card-img-top to an **<img>** to place the image at the top inside the card.

.card-img-bottom to an **<img>** to place the image at the bottom inside the card.
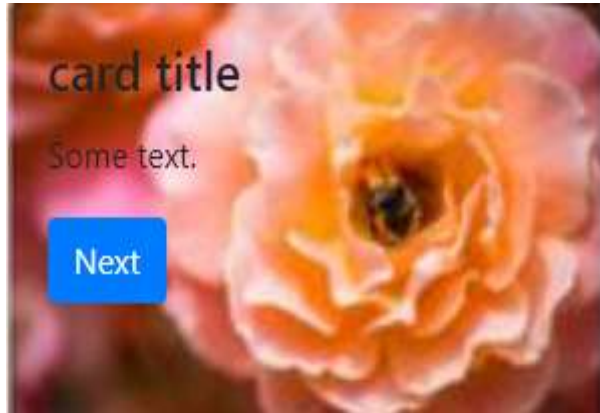

Apply **.stretched-link** class to a link inside the card, and it will make the whole card clickable and hoverable (the card will act as a link)

```
<a href="#" class="btn btn-primary stretched-link">See Profile</a>
```

Card Image Overlays:

Turn an image into a card background and use `.card-img-overlay` to add text on top of the image


```html
<div class="card" style="width:300px">
  <img class="card-img-top" src="img1.png">
  <div class="card-img-overlay">
    <h4 class="card-title">John Doe</h4>
    <p class="card-text">Some text.</p>
    <a href="#" class="btn btn-primary">Next</a>
  </div>
</div>
```

`.card-columns` : creates a masonry-like grid of cards (like pinterest).

`.card-deck` class creates a grid of cards that are of **equal height and width**.

`.card-group` class is similar to `.card-deck`. The only difference is that the `.card-group` class removes left and right margins between each card.

The **collapse** is used to show and hide another element on the page.

Ex. `<button data-bs-toggle="collapse" data-bs-target="#col">Collapsible</button>`
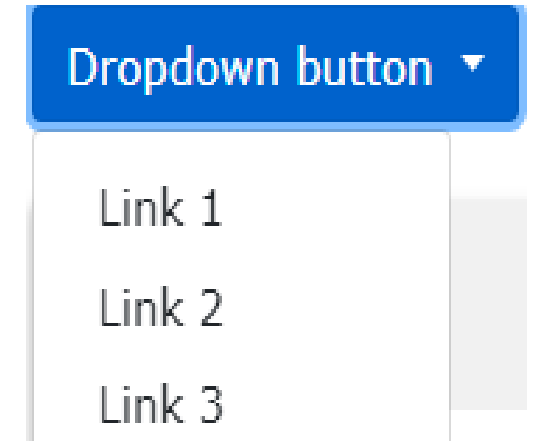`<div id="col" class="collapse">`
`This is the example of collapse....`
`</div>`

For Dropdown we need to include popper.js file:

```
<script src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.11.5/dist/umd/popper.min.js">
</script>
```

Class/Attribute	Purpose
dropdown	Specifies a dropdown menu
dropdown-toggle	Specifies the trigger element i.e the element which shows or hides the dropdown menu.
data-bs-toggle	This attribute is required on the trigger element to show or hide the dropdown menu
dropdown-menu	The unordered list with this class specifies the dropdown menu items
dropdown-divider	used to separate links inside the dropdown menu with a thin horizontal border.
dropdown-header	used to add headers inside the dropdown menu.
dropdown-item	Used to specifies the dropdown item

```
<div class="dropdown">
 <button type="button" class="btn btn-primary dropdown-toggle"
data-bs-toggle="dropdown">
   Dropdown button
 </button>
 <ul class="dropdown-menu">
  <li> <a class="dropdown-item" href="#">Link 1</a> </li>
<li> <a class="dropdown-item" href="#">Link 2</a> </li>
 <li>  <a class="dropdown-item" href="#">Link 3</a> </li>
  </ul>
</div>
```
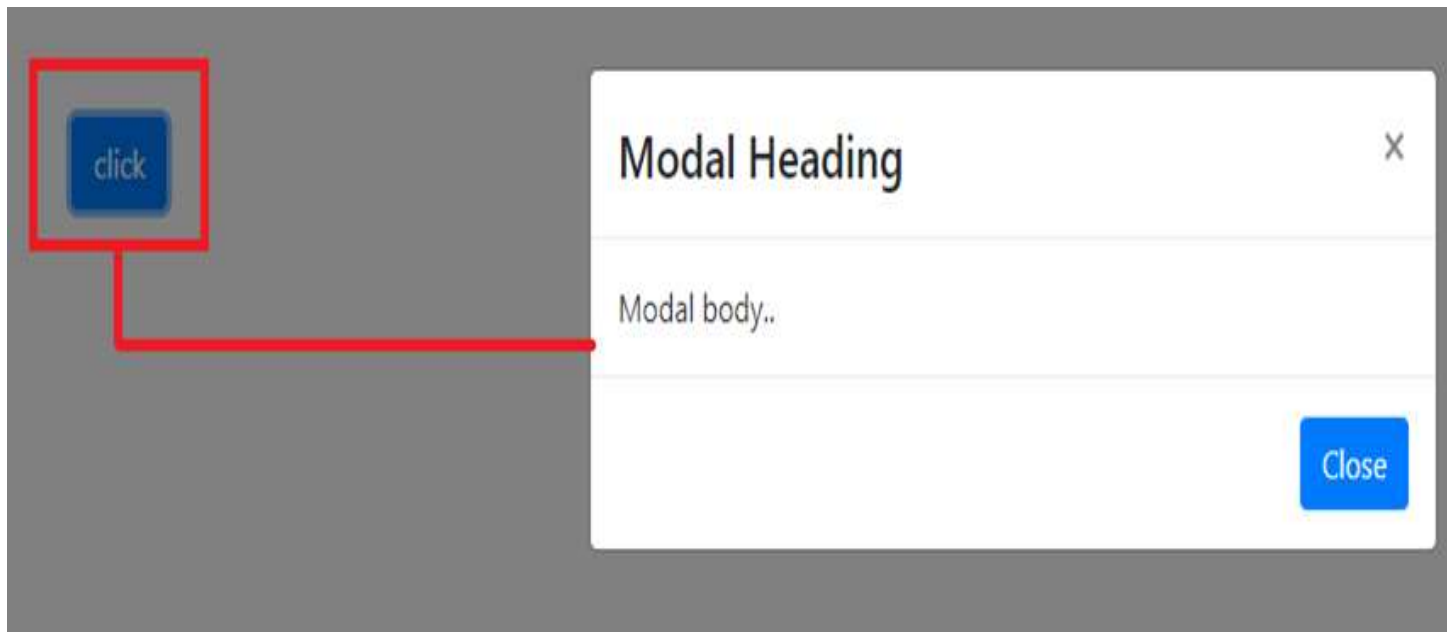

Dropdown Position:`.dropright` or `.dropleft`
```
<div class="btn-group dropend">
<div class=" btn-group dropstart">
```

Dropup: If you want the dropdown menu to expand upwards instead of downwards.
```
<div class=" btn-group dropup">
```

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

Attributes and classes to customize the behaviour of the modal:

Class	Description
.fade	Use to add a fading effect when opening and closing the modal
.modal-sm	Creates a small modal.
.modal-lg	Creates a large modal.
.modal-dialog-centered	Center the modal vertically and horizontally within the page

Attribute	Description
data-bs-backdrop="static"	prevents modal closing when clicked outside the modal

```html
<button type="button" class="btn btn-primary" data-bs-toggle="modal" data-bs-target="#myModal">
  Open modal
</button>
<div class="modal" id="myModal">
  <div class="modal-dialog">
    <div class="modal-content">
      <div class="modal-header">
        <h4 class="modal-title">Modal Heading</h4>
        <button type="button" class="btn-close" data-bs-dismiss="modal"></button>
      </div>
      <div class="modal-body">
        Modal body..
      </div>
      <div class="modal-footer">
        <button type="button" class="btn-close btn btn-primary" data-bs-dismiss="modal">Close</button>
      </div>
    </div>
  </div>
</div>
```

Bootstrap provides two types of form layouts:

- **Stacked (full-width) form**
- **form**

The following are the classes that are used to style forms:

Add a wrapper element with .form-group, around each form control, to ensure proper margins

.form-control - Use this class on all textual elements (<input>, <textarea>, and <select>)

Email:

Password:

☐ Remember me

Submit

```
<form>
  <div class="form-group">
    <label for="email">Email:</label>
    <input type="email" class="form-control">
  </div>
  <div class="form-group">
    <label for="pwd">Password:</label>
    <input type="password" class="form-control">
  </div>
  <div class="form-group form-check">
    <label class="form-check-label">
      <input class="form-check-input" type="checkbox"> Remember me
    </label>
  </div>
  <button type="submit" class="btn btn-primary">Submit</button>
</form>
```

Email: [   ]

Password: [   ]

☐ Remember
Me

[Submit]

```
<form>
  <div class="form-group row">
    <label for="email" class="col-form-label col-sm-2">Email:</label>
    <div class="col-sm-10">
    <input type="email" class="form-control" id="email">
  </div>
    </div>
  <div class="form-group row">
    <label for="pwd" class="col-form-label col-sm-2">Password:</label>
    <div class="col-sm-10">
    <input type="password" class="form-control" id="pwd">
  </div>
    </div>
     <div class="form-group row">
    <div class="col-sm-2 offset-sm-2">
      <div class="form-check">
        <input class="form-check-input" type="checkbox">
        <label class="form-check-label">
      Remember Me
        </label>
      </div>
    </div>
  </div>
  <button type="submit" class="btn btn-primary offset-sm-2">Submit</button>
</form>
```
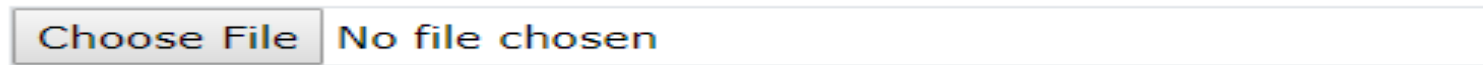
Bootstrap Textarea:

```
<div class="form-group">
  <label for="address">Address:</label>
  <textarea class="form-control" rows="5" id="address"></textarea>
</div>
```

Bootstrap Checkboxes:

< <div class="form-check"> <input class="form-check-input" type="checkbox" value="" id="flexCheckDefault"> <label class="form-check-label" for="flexCheckDefault"> Default checkbox </label> </div>

Use the `.form-check-inline` class if you want the checkboxes to appear on the same line

Bootstrap Radio Buttons:

< <div class="form-check"> <input class="form-check-input" type="radio" name="flexRadioDefault" id="flexRadioDefault1"> <label class="form-check-label" for="flexRadioDefault1"> Default radio </label> </div>

<input class="form-control" type="file" id="formFile">

Choose File   No file chosen

Bootstrap Select List

<select class="form-select" >
<option selected>Open this select menu</option>
 <option value="1">One</option>
<option value="2">Two</option>
<option value="3">Three</option>
 </select>

Switches

 Default switch checkbox input

```
<div class="form-check form-switch">
 <input class="form-check-input" type="checkbox">
<label class="form-check-label">Default switch checkbox input</label>
</div>
```

Floating labels:-

```
<div class="form-floating mb-3">
<input type="email" class="form-control" id="floatingInput" placeholder="name@example.com">
<label for="floatingInput">Email address</label>
</div>
```
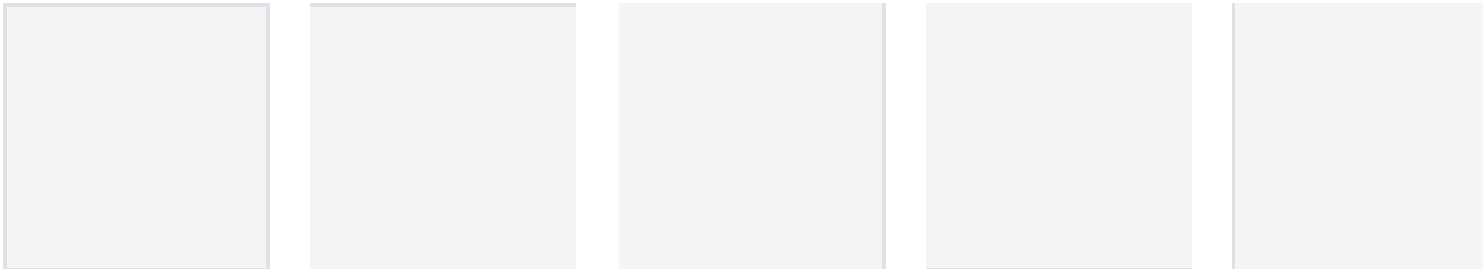
Class	Description
.input-group	A container to enhance an input by adding an icon, text or a button in front or behind the input field as a "help text".
.input-group-prepend	to add the help text in front of the input
.input-group-append	to add it behind the input.
.input-group-text	style the specified help text

```html
<div class="input-group">
        <span class="input-group-text">$</span>
    <input type="text" class="form-control">
 </div>
```

Borders:

```
<span class="border"></span>
<span class="border-top"></span>
<span class="border-end"></span>
<span class="border-bottom"></span>
<span class="border-start"></span>
```

Border color:

```html
<span class="border border-primary"></span>
<span class="border border-secondary"></span>
<span class="border border-success"></span>
<span class="border border-danger"></span>
<span class="border border-warning"></span>
<span class="border border-info"></span>
<span class="border border-light"></span>
<span class="border border-dark"></span>
<span class="border border-white"></span>
```

Border Radius:

.rounded,. rounded-top,. rounded-end,. rounded-bottom,. rounded-start,. rounded-circle,. rounded-0

Width & Height:

.w-25   : Width 25%   .h-25   : Height 25%

.w-50   : Width 50%   .h-50   : Height 50%

.w-75   : Width 75%   .h-75   : Height 75%

.w-100 : Width 100%   .h-100 : Height 100%

.mw-100   : Max Width 100%   .mh-100   : Max Height 100%

Spacing:

Bootstrap 4 has a wide range of responsive margin and padding utility classes.

The classes are named using the format :

{property}{sides}-{size} for xs and

{property}{sides}-{breakpoint}-{size} for sm, md, lg, and xl.

Where *property* is one of:

m - for classes that set margin

p - for classes that set padding

Where *sides* is one of:

- t - for classes that set margin-top or padding-top
- b - for classes that set margin-bottom or padding-bottom
- s - (start) for classes that set margin-left or padding-left in LTR, margin-right or padding-right in RTL
- e - (end) for classes that set margin-right or padding-right in LTR, margin-left or padding-left in RTL
- x - for classes that set both *-left and *-right
- y - for classes that set both *-top and *-bottom
- blank - for classes that set a margin or padding on all 4 sides of the element

Where *size* is one of:

- 0 - for classes that eliminate the margin or padding by setting it to 0
- 1 - (by default) for classes that set the margin or padding to $spacer * .25
- 2 - (by default) for classes that set the margin or padding to $spacer * .5
- 3 - (by default) for classes that set the margin or padding to $spacer
- 4 - (by default) for classes that set the margin or padding to $spacer * 1.5
- 5 - (by default) for classes that set the margin or padding to $spacer * 3
- auto - for classes that set the margin to auto

Display property:

To make an element into a block element.

As such, the classes are named using the format:

- .d-{value} for xs

- .d-{breakpoint}-{value} for sm, md, lg, and xl.

```
<span class="d-block bg-success">d-block</span>
<span class="d-sm-block bg-success">d-sm-block</span>
```

```
<div class="d-inline p-2 bg-primary text-white">d-inline</div>
<div class="d-inline p-2 bg-dark text-white">d-inline</div>
```

Text selection :-

<p class="user-select-all">This paragraph will be entirely selected when clicked by the user.</p>

<p class="user-select-auto">This paragraph has default select behavior.</p>

<p class="user-select-none">This paragraph will not be selectable when clicked by the user.</p>

Opacity :-
<div class="opacity-100">...</div>
<div class="opacity-75">...</div>
<div class="opacity-50">...</div>
<div class="opacity-25">...</div>

Bootstrap navbar

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

```html
<nav class="navbar navbar-expand-sm bg-secondary  navbar-light">

   <ul class="navbar-nav">
    <li class="nav-item active">
      <a class="nav-link" href="#">Home</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">About</a>
    </li>
    <li class="nav-item">
      <a class="nav-link" href="#">Contact</a>
    </li>
   </ul>

</nav>
```

Home   About   Contact

Vertical Navbar:

Remove the `.navbar-expand-xl|lg|md|sm` class to create a vertical navigation bar.

Class	Description
`.justify-content-center`	center the navigation bar
`.navbar-brand`	used to highlight the brand/logo/project name of your page
`.fixed-top`	makes the navigation bar fixed at the **top**
`.fixed-bottom`	make the navbar stay at the **bottom** of the page
`.sticky-top`	make the navbar fixed/stay at the **top** of the page when you scroll **past** it
`.navbar-dark`	Add a **white** text color to all links in the navbar
`.navbar-light`	add a **black** text color to all links in the navbar
`.navbar-text`	Use to vertical align any elements inside the navbar that are not links

Bootstrap navbar component

It is useful for creating responsive navigation header for a website. When the toggle button is clicked the navbar expands. However, on large screen devices like laptops and desktops, where we have enough room to display the entire navbar, it appears normal.

Creating responsive navbar : The navbar appears normal on a large screen size devices like laptops, desktops etc.

The navbar appears collapsed on a small screen size devices like mobile phones, portrait tablets etc. The navbar expands when the toggle button is clicked.

```html
<nav class="navbar navbar-expand-md bg-dark navbar-dark">
  <!-- Brand -->
  <a class="navbar-brand" href="#">Infoway</a>

  <!-- Toggler/collapsibe Button -->
  <button class="navbar-toggler" type="button" data-bs-
toggle="collapse" data-bs-target="#colNav">
    <span class="navbar-toggler-icon"></span>
  </button>

  <!-- Navbar links -->
  <div class="collapse navbar-collapse" id="colNav">
    <ul class="navbar-nav">
      <li class="nav-item active">
        <a class="nav-link" href="#">Home</a>
      </li>
      <li class="nav-item">
        <a class="nav-link" href="#">About</a>
      </li>
      <li class="nav-item">
        <a class="nav-link" href="#">Contact</a>
      </li>
    </ul>
  </div>
</nav>
```

The Carousel is a slideshow for cycling through elements.


```
<div id="myCarousel" class="carousel slide"
data-bs-ride="carousel">
```

Class	Description
.carousel	Creates a carousel
.carousel-indicators	Adds indicators for the carousel. These are the little dots at the bottom of each slide (which indicates how many slides there are in the carousel, and which slide the user are currently viewing)
.carousel-inner	Adds slides to the carousel
.carousel-item	Specifies the content of each slide
.carousel-control-prev	Adds a left (previous) button to the carousel, which allows the user to go back between the slides
.carousel-control-next	Adds a right (next) button to the carousel, which allows the user to go forward between the slides
.carousel-control-prev-icon	Used together with .carousel-control-prev to create a "previous" button
.carousel-control-next-icon	Used together with .carousel-control-next to create a "next" button
.slide	Adds a CSS transition and animation effect when sliding from one item to the next. Remove this class if you do not want this effect

END

Thank You