



School of
Infocomm

C219 Front-end Web Development

Lesson 6

Front-end Frameworks

The background is a solid orange color. On the left side, there is a faint, stylized graphic of a magnifying glass. The handle of the magnifying glass is composed of several lines, some of which are dotted. The lens of the magnifying glass is positioned over a set of binary code (0s and 1s) that is also rendered in a light orange color. The binary code is arranged in three rows: the first row contains '0011', the second row contains '1111', and the third row contains '1001'.

0011
1111
1001

Recap

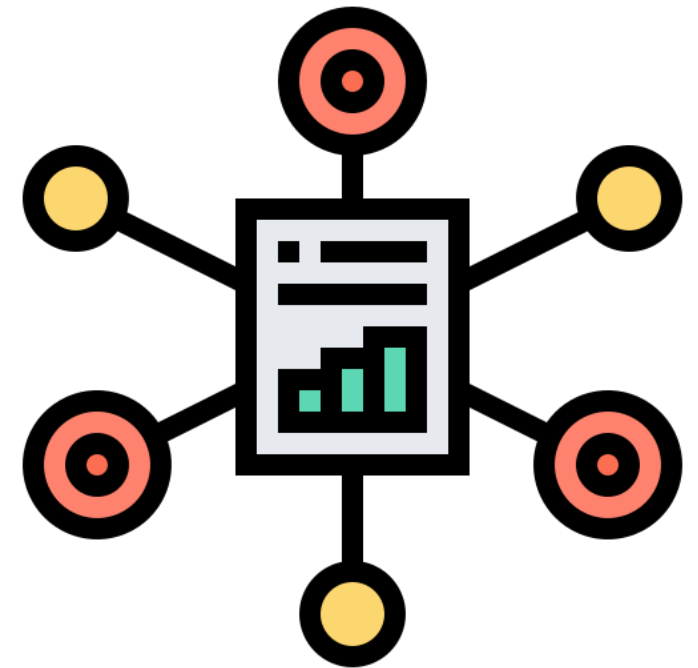
Lesson 5

What is a Front-end Framework?

The front-end of a website refers to its graphical user interface, usually created using HTML, CSS, and JavaScript, to allow users to view and interact with the website.

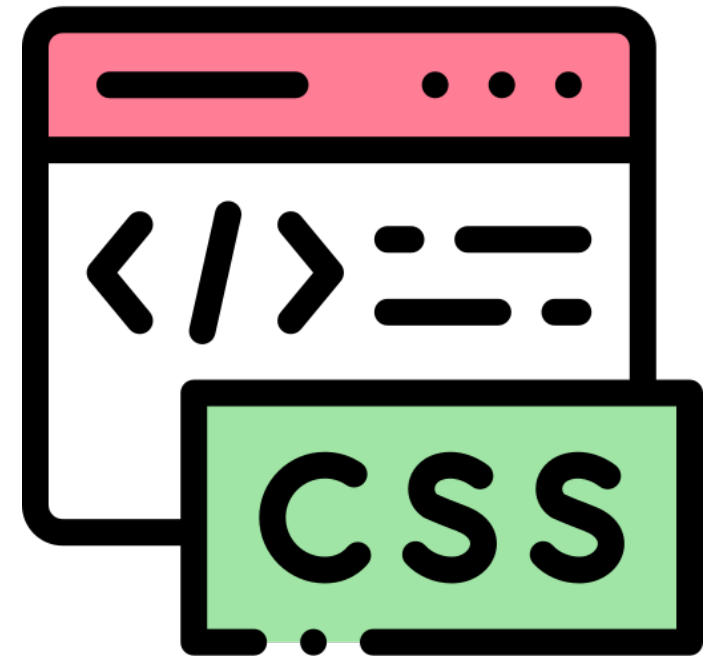
A framework is defined as a package made up of standardised code (HTML, CSS, JS, etc.) which is used to support the development of web applications.

There are two main types of front-end frameworks – CSS frameworks and JavaScript frameworks.



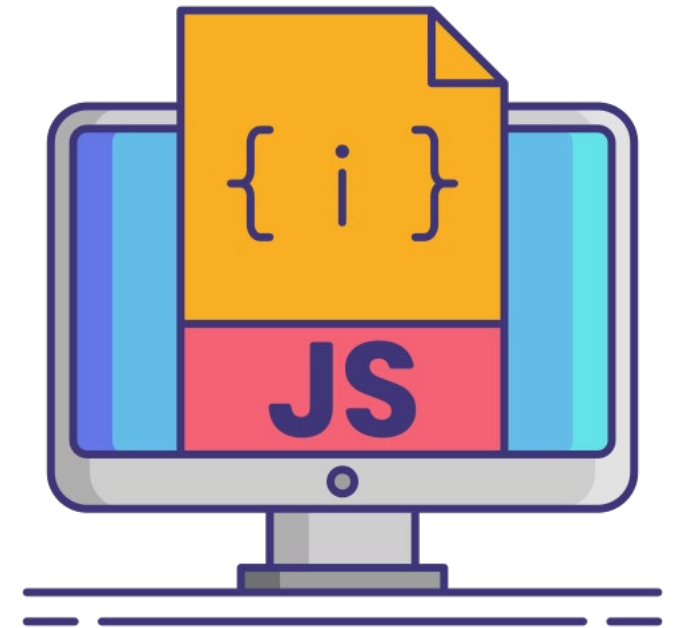
CSS Frameworks

- [Bootstrap](#)
- [Foundation](#)
- [Ulkit](#)
- [Semantic UI](#)
- [Materialize](#)



JS Frameworks

- [React](#)
- [Angular](#)
- [Vue.js](#)



Bootstrap

Bootstrap is the world's most popular front-end open source toolkit, featuring a responsive grid system, extensive prebuilt components, and powerful JavaScript plugins.

You will be learning about Bootstrap Layouts, Utilities and Components to build a web page.

<https://getbootstrap.com>



Getting Started

The fastest and easiest way to include Bootstrap in your project is by using jsDeliver, a free open-source content delivery network (CDN).

Getting started with Bootstrap:

To load Bootstrap's CSS, insert this before `</head>`:

```
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/css/bootstrap.min.css" rel="stylesheet">
```

To load Bootstrap's JS, insert this before `</head>`:

```
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/js/bootstrap.bundle.min.js"></script>
```

Content

Bootstrap sets basic global display, typography, and link styles, and uses a native font stack that selects the best font-family for each operating system and device.

- All HTML5 text elements like heading, paragraph and lists are available.
- Images in Bootstrap are made responsive with `.img-fluid`.
- Bootstrap also includes several predefined styles for elements like buttons.

```
<h1>Hello World</h1>
<p>I love Bootstrap :)</p>
<button type="button" class="btn btn-primary">Click Me!</button>

```


Utilities

Bootstrap provides ways to customise the properties of your web page elements like:

- [Background colours](#)
- [Text colours](#)
- [Opacity](#)
- [Shadows](#)
- [Sizing](#)
- [Spacing](#)
- [Float](#)
- [Flex](#)

Breakpoints

Breakpoints are customizable widths that determine how your responsive layout behaves across device or viewport sizes in Bootstrap.

Breakpoint	Class infix	Dimensions	Device
X-Small	None	<576px	Phone
Small	sm	≥576px	Phone
Medium	md	≥768px	Phone / Tablet
Large	lg	≥992px	Tablet / Laptop
Extra large	xl	≥1200px	Laptop / Desktop

Containers

Containers are the most basic layout element in Bootstrap and are required when using our default grid system. Containers are used to wrap the elements within them.

Class	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	X-Large ≥1200px	XX-Large ≥1400px
.container	100%	540px	720px	960px	1140px	1320px
.container-sm	100%	540px	720px	960px	1140px	1320px
.container-md	100%	100%	720px	960px	1140px	1320px
.container-lg	100%	100%	100%	960px	1140px	1320px
.container-xl	100%	100%	100%	100%	1140px	1320px
.container-xxl	100%	100%	100%	100%	100%	1320px
.container-fluid	100%	100%	100%	100%	100%	100%

Grid System

Bootstrap's grid system uses a series of containers, rows, and columns to layout and align content. It's built with flexbox and is fully responsive. There are 12 columns available per row, allowing you to create different combinations of elements that span any number of columns.

```
<div class="container">
  <div class="row">
    <div class="col-sm-6">Column 1</div>
    <div class="col-sm-3">Column 2</div>
    <div class="col-sm-3">Column 3</div>
  </div>
</div>
```

Exercise 1

Create a hero banner for a web page.

Requirements:

- The banner must contain a heading, paragraph, button and image
- The banner must fill the viewport width and have a background colour
- The banner contents must be inside a .container div and aligned center horizontally
- The image must be a person with background removed
- The content must be responsive and adapt to small screens
- Use exercise1.html in your resources folder



Refer to the wireframe in the next slide for the hero layout.

Exercise 1 Wireframe

Bootstrap Hero

This is my first time trying out Bootstrap and I am enjoying it! Look what I made here.

[Learn more](#)



Cards

A card is a flexible and extensible content container. It includes options for headers and footers, a wide variety of content, contextual background colors, and powerful display options.

```
<div class="card w-25">
  
  <div class="card-body">
    <h5 class="card-title">Card title</h5>
    <p class="card-text">Some 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">Learn more</a>
  </div>
</div>
```

Carousel

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

```
<div id="carouselExampleControls" class="carousel slide" data-bs-ride="carousel">
  <div class="carousel-inner">
    <div class="carousel-item active"></div>
    <div class="carousel-item"></div>
  </div>
  <button class="carousel-control-prev" type="button" data-bs-target="#carouselExampleControls" data-bs-slide="prev">
    <span class="carousel-control-prev-icon" aria-hidden="true"></span>
  </button>
  <button class="carousel-control-next" type="button" data-bs-target="#carouselExampleControls" data-bs-slide="next">
    <span class="carousel-control-next-icon" aria-hidden="true"></span>
  </button>
</div>
```


Navbar

The Bootstrap navbar supports branding, dropdowns, toggling and more.

```
<nav class="navbar navbar-expand-lg navbar-dark bg-dark">
  <div class="container-fluid">
    <a class="navbar-brand" href="#">My Navbar</a>
    <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-target="#navbarToggler"><span class="navbar-toggler-
icon"></span>
  </button>
  <div class="collapse navbar-collapse" id="navbarToggler">
    <ul class="navbar-nav">
      <li class="nav-item"><a class="nav-link active" 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>
</div>
</nav>
```

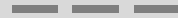
Exercise 2

Create a web page consisting of a navbar, carousel and cards.

Requirements:

- The navbar must contain three menu items
- The carousel must have controls, indicators and contain three images
- Create three cards, each containing an image, title, text, button and footer
- Image and textual content can be anything
- All content must be responsive and adapt to small screens
- Refer to the wireframe in the next slide for the page layout





Card Title

Some quick example text to build on the card title and make up the bulk of the card's content.

Learn more

Card footer

Card Title

Some quick example text to build on the card title and make up the bulk of the card's content.

Learn more

Card footer

Card Title

Some quick example text to build on the card title and make up the bulk of the card's content.

Learn more

Card footer

Bootstrap Icons

Bootstrap Icons is a growing library of SVG icons with over 1,300 icons.

Getting Started:

Include this link below your Bootstrap CSS:

```
<link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap-icons@1.5.0/font/bootstrap-icons.css">
```

Go to <https://icons.getbootstrap.com>, select the icon that you want to use, and copy the icon font code.

```
<i class="bi bi-alarm"></i>
```

Font Awesome

Font Awesome an icon set and toolkit that offers vector icons and social logos for your website.

Getting Started:

1. Sign up at <https://fontawesome.com/start>
2. Login > Account (at the top right) > Font Awesome CDN
3. Copy the stylesheet link, paste it in your web page and you're good to go!
4. Select / search for your desired icons from the Icons page and copy the HTML code for use

```
<i class="far fa-clock"></i>
```

L06 Assignment

The School of Infocomm (S0I) Learning Portal is an online catalogue of coding lessons that provides you with an easy way to sign up for different programmes that would best fit your learning needs and preferences.

You are part of the front-end development team and you are required to code the home page of the S0I Learning Portal using Bootstrap.

The requirements and wireframe are provided in L06 Assignment.docx.



Deliverables

Individual Submission:

- Exercise 1
- Exercise 2
- L06 Assignment

Others:

- Reflection Journal

Submit all deliverables
by 2359 today