Mobile and Web Development

Department of Automation and Applied Informatics

Bootstrap

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Dr. Mohammad Saleem

msaleem@aut.bme.hu

Bootstrap

Introduction

Bootstrap is a free, open source front-end development framework for the creation of websites and web apps. Designed to enable responsive development of mobile-first websites, Bootstrap provides a collection of syntax for template designs.

As a framework, Bootstrap includes the basics for responsive web development, so developers only need to insert the code into a pre-defined grid system. 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.

Bootstrap makes responsive web design a reality. It makes it possible for a web page or app to detect the visitor's screen size and orientation and automatically adapt the display accordingly. The mobile-first approach assumes smartphones, tablets and task-specific mobile apps are employees' primary tools for getting work done. Bootstrap addresses the requirements of those technologies in design and includes UI components, layouts, JavaScript tools and the implementation framework. The software is available precompiled or as source code.

What do we get from Bootstrap?

- Formatting for tags with semantic meaning like <blockquote>, <mark> or headings and gives a nice typography basics for the <body>
- Many shortcut classes (e.g. success, warning)
- Supports formatting tables and forms
- Gives some basic building blocks, e.g. its responsive grid system

The Bootstrap grid

- **Mobile first:** first we define the layout for mobile, then as the resolution grows we keep overwriting it
  - > The sizing is adaptive
- The screen is divided to columns and rows. Each row contains 12 same size cells. The number of rows is unlimited.
  - > Content can span through multiple columns
  - > The height of a row is usually not set manually, but is determined by the cell with the highest content.

Using the grid

- The root of the grid is either a container or a container-fluid class
  - > Place elements with row class into it …
  - > … that can exclusively contains elements with col-X-* class

	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	Extra large ≥1200px
Max container width	None (auto)	540px	720px	960px	1140px
Class prefix	.col-	.col-sm-	.col-md-	.col-lg-	.col-xl-
# of columns	12				
Gutter width	30px (15px on each side of a column)				
Nestable	Yes				
Column ordering	Yes				

Gutters are the padding between your columns, used to responsively space and align content in the Bootstrap grid system.
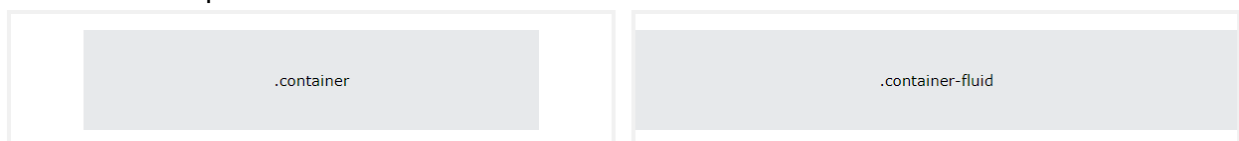
A col-X-* classes

- Use a prefix to indicate the minimum supported resolution
  - > E.g. the col-sm-* is used on both tablets and dektops, but not on mobile devices
- More specific classes overwrite less specific ones
  - > E.g. col-sm-* overwrites col-xs-*, as col-sm-* is applicable for less screen resolutions
- * defines the number or columns to span
  - > The number of columns is always 12
  - > The default cell size is also 12
    - – E.g. if a cell has col-sm-* class that means 12 width by default that is full width

Containers

Bootstrap also requires a containing element to wrap site contents.
There are two container classes to choose from:
1. The .container class provides a responsive **fixed width container**
2. The .container-fluid class provides a **full width container**, spanning the entire width of the viewport.

.container

.container-fluid

Bootstrap Grid System

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:

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

The Bootstrap grid system has four classes:

- xs (for phones - screens less than 768px wide)
- sm (for tablets - screens equal to or greater than 768px wide)
- md (for small laptops - screens equal to or greater than 992px wide)
- lg (for laptops and desktops - screens equal to or greater than 1200px wide)

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

Tables

Tables allow you to aggregate a huge amount of data and present it in a clear and orderly way. MDB tables provide additional benefits like responsiveness and the possibility of manipulating the table styles.

Due to the widespread use of <table> elements across third-party widgets like calendars and date pickers, Bootstrap's tables are **opt-in**. Add the base class .table to any <table>, then extend with our optional modifier classes or custom styles. All table styles are not inherited in Bootstrap, meaning any nested tables can be styled independently from the parent.
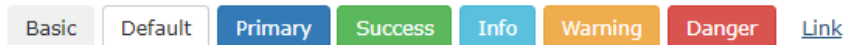
Responsive Images

- **Goal:** image should fill the area of the parent but keep aspect ratio
- Solution:
    max-width: 100%;
    height: auto;
    display: block;
- Bootstrap: img-responsive class (shortcut for the same)

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.

```
<div class="container">
  <h2>Image</h2>
  <p>The .img-responsive class makes the image scale nicely to the parent element (resize the
browser window to see the effect):</p>
  <img class="img-responsive" src="img1.jpg" alt="image1" width="400" height="300">
</div>
```

Buttons

Bootstrap provides different styles of buttons:

```
<button type="button" class="btn">Basic</button>
<button type="button" class="btn btn-default">Default</button>
<button type="button" class="btn btn-primary">Primary</button>
<button type="button" class="btn btn-success">Success</button>
<button type="button" class="btn btn-info">Info</button>
<button type="button" class="btn btn-warning">Warning</button>
<button type="button" class="btn btn-danger">Danger</button>
<button type="button" class="btn btn-link">Link</button>
```

The classes that define the different sizes are:
- .btn-lg
- .btn-sm
- .btn-xs

A button can be set to an active (appear pressed) or a disabled (unclickable) state:

```
<button type="button" class="btn btn-primary active">Active Primary</button>
<button type="button" class="btn btn-primary disabled">Disabled Primary</button>
```

Navigation Bars

A navigation bar is a navigation header that is placed at the top of the page. With Bootstrap, a navigation bar can extend or collapse, depending on the screen size.

A standard navigation bar is created with the .navbar class, followed by a responsive collapsing class: .navbar-expand-xxl|xl|lg|md|sm (stacks the navbar vertically on xxlarge, extra large, large, medium or small screens).

To add links inside the navbar, use either an <ul> element (or a <div>) with class="navbar-nav". Then add <li> elements with a .nav-item class followed by an <a> element with a .nav-link class

Forms

Bootstrap provides a variety of components for styling forms, making it easy to create responsive and visually appealing forms with minimal custom CSS. Here's an overview of the main components and how to use them.

Bootstrap forms can be created using the form tag with Bootstrap classes for form control elements like input, textarea, and select.

Bootstrap makes it simple to create clean, responsive forms with its set of classes like .form-control, .form-label, .form-check, and more. With these classes, you can apply consistent styling, manage form validation, and create forms that are both functional and visually appealing across different devices.

```
<div class="container">
  <h2>Horizontal form</h2>
  <form class="form-horizontal" action="/action_page.php">
```

```html
    <div class="form-group">
      <label class="control-label col-sm-2" for="email">Email:</label>
      <div class="col-sm-10">
        <input type="email" class="form-control" id="email" placeholder="Enter email" name="email">
      </div>
    </div>
    <div class="form-group">
      <label class="control-label col-sm-2" for="pwd">Password:</label>
      <div class="col-sm-10">
        <input type="password" class="form-control" id="pwd" placeholder="Enter password"
name="pwd">
      </div>
    </div>
    <div class="form-group">
      <div class="col-sm-offset-2 col-sm-10">
        <div class="checkbox">
          <label><input type="checkbox" name="remember"> Remember me</label>
        </div>
      </div>
    </div>
    <div class="form-group">
      <div class="col-sm-offset-2 col-sm-10">
        <button type="submit" class="btn btn-default">Submit</button>
      </div>
    </div>
  </form>
</div>
```

Email: Enter email

Password: Enter password

☐ Remember me

Submit

Code examples

Contextual Backgrounds

```html
<!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://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jquery.min.js"></script>
  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></script>
</head>
<body>

<div class="container">
  <h2>Contextual Backgrounds</h2>
```

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

</body>
</html>
```

Use the contextual background classes to provide "meaning through colors":

This text is important.

This text indicates success.

This text represents some information.

This text represents a warning.

This text represents danger.

Basic table

```
<!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://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jquery.min.js"></script>
  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></script>
</head>
<body>

<div class="container">
  <h2>Basic Table</h2>
  <p>The .table class adds basic styling (light padding and only horizontal dividers) to a
table:</p>
  <table class="table">
    <thead>
      <tr>
        <th>Firstname</th>
        <th>Lastname</th>
        <th>Email</th>
      </tr>
    </thead>
    <tbody>
      <tr>
        <td>John</td>
        <td>Doe</td>
        <td>john@example.com</td>
      </tr>
      <tr>
        <td>Mary</td>
        <td>Moe</td>
        <td>mary@example.com</td>
      </tr>
      <tr>
        <td>July</td>
        <td>Dooley</td>
        <td>july@example.com</td>
      </tr>
    </tbody>
```

```
    </table>
</div>

</body>
</html>
```

Basic Table

The .table class adds basic styling (light padding and only horizontal dividers) to a table:

Firstname	Lastname	Email
John	Doe	john@example.com
Mary	Moe	mary@example.com
July	Dooley	july@example.com

NAVBAR

```
<!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@5.3.3/dist/css/bootstrap.min.css"
rel="stylesheet">
  <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</head>
<body>

<nav class="navbar navbar-expand-sm bg-light navbar-light">
  <div class="container-fluid">
    <ul class="navbar-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>
  </div>
</nav>

<nav class="navbar navbar-expand-sm bg-dark navbar-dark">
  <div class="container-fluid">
    <ul class="navbar-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>
  </div>
</nav>

<nav class="navbar navbar-expand-sm bg-primary navbar-dark">
  <div class="container-fluid">
    <ul class="navbar-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>
  </div>
</nav>

</body>
</html>
```

Mobile and Web Development

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Bootstrap Demo</title>
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css"
rel="stylesheet">
</head>
<body>

  <!-- Navbar -->
  <nav class="navbar navbar-expand-lg navbar-dark bg-dark">
    <div class="container">
      <a class="navbar-brand" href="#">Mobile and Web Development</a>
      <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-
target="#navbarNav" aria-controls="navbarNav" aria-expanded="false" aria-label="Toggle navigation">
        <span class="navbar-toggler-icon"></span>
      </button>
      <div class="collapse navbar-collapse" id="navbarNav">
        <ul class="navbar-nav ms-auto">
          <li class="nav-item"><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="#">Syllabus</a></li>
          <li class="nav-item"><a class="nav-link" href="#">Registration</a></li>
        </ul>
      </div>
    </div>
  </nav>

  <!-- Hero Section -->
  <div class="container text-center my-5">
    <h1>Welcome to the Mobile and Web Development course</h1>
    <p class="lead">A simple example of using Bootstrap</p>
    <a href="without.html" class="btn btn-primary btn-lg">Click me</a>
    <p class="lead">Click this button to see this page without Bootstrap</p>
```

```html
    </div>

    <!-- Grid System -->
    <div class="container">
      <div class="row text-center">
        <div class="col-md-4 mb-4">
          <div class="card">
            <div class="card-body">
              <h5 class="card-title">About the course</h5>
              <p class="card-text">An introduction about the course.</p>
              <a href="#" class="btn btn-secondary">Learn More</a>
            </div>
          </div>
        </div>
        <div class="col-md-4 mb-4">
          <div class="card">
            <div class="card-body">
              <h5 class="card-title">Syllabus</h5>
              <p class="card-text">Details about the course content.</p>
              <a href="#" class="btn btn-secondary">Learn More</a>
            </div>
          </div>
        </div>
        <div class="col-md-4 mb-4">
          <div class="card">
            <div class="card-body">
              <h5 class="card-title">Exams</h5>
              <p class="card-text">Exams schedule.</p>
              <a href="#" class="btn btn-secondary">Learn More</a>
            </div>
          </div>
        </div>
      </div>
    </div>

    <!-- Form Section -->
    <div class="container my-5">
      <h2 class="text-center">Course registration</h2>
      <form>
        <div class="row mb-3">
          <div class="col-md-6">
            <label for="firstName" class="form-label">First Name</label>
            <input type="text" class="form-control" id="firstName" placeholder="John">
          </div>
          <div class="col-md-6">
            <label for="lastName" class="form-label">Last Name</label>
            <input type="text" class="form-control" id="lastName" placeholder="Doe">
          </div>
        </div>
        <div class="mb-3">
          <label for="email" class="form-label">Email address</label>
          <input type="email" class="form-control" id="email" placeholder="name@example.com">
        </div>
        <div class="mb-3">
          <label for="message" class="form-label">Message</label>
          <textarea class="form-control" id="message" rows="3"></textarea>
        </div>
        <button type="submit" class="btn btn-primary">Submit</button>
      </form>
    </div>

    <!-- Footer -->
    <footer class="bg-dark text-white text-center py-3">
      <p class="mb-0"> 2024 </p>
```

```
    </footer>

    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
```

USEFUL LINKS AND REFERENCES:

https://www.techtarget.com/whatis/definition/bootstrap
https://www.w3schools.com/bootstrap/bootstrap_get_started.asp
https://www.youtube.com/watch?v=Jyvffr3aCp0&ab_channel=WebDevSimplified
https://www.w3schools.com/bootstrap/bootstrap_buttons.asp
https://getbootstrap.com/docs/4.0/getting-started/introduction/
https://getbootstrap.com/docs/4.0/layout/overview/
https://getbootstrap.com/docs/4.0/content/reboot/
https://getbootstrap.com/docs/4.0/components/alerts/
https://getbootstrap.com/docs/4.0/components/forms/