

Web Application Development

Responsive Design & Bootstrap

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Tentative Schedule

- Exam I
 - Tuesday 2/27
- OR
 - Thursday 2/29

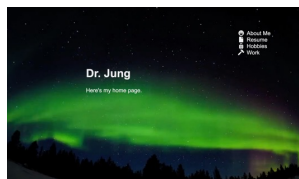
2

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Assignment 1

You must submit assignment1.html on **BlackBoard**.

Do NOT upload to **github.io** since all source code is visible to everyone.



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CSS Layout

- One of the main problems faced by web designers is that the size of the screen used to view the page can vary quite a bit.
 - 21-inch wide screen monitor (1920x1080 pixels)
 - older iPhone with a 3.5-inch screen (320x480 pixels)

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Responsive Design

- In a **responsive design**, the page “responds” to changes in the browser size. For example,
 - images may be scaled down (not fixed size)
 - navigation elements may be replaced as the browser shrinks (e.g., list of hyperlinks changes to a <select>).

https://www.w3schools.com/tags/tag_select.asp

To make responsive design:

1. Setting **viewports** via the **<meta>** tag
 - The viewport is the user's visible area of a web page.
 - The viewport varies with the device and will be smaller on a mobile phone than on a computer screen.
2. Customizing the CSS for different viewports using **media queries**

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1. Viewport



Responsive
Layout using
viewport

name="viewport": gives the browser instructions on how to control the page's dimensions and scaling.
width=device-width: sets the width of the page to follow the screen-width of the device
initial-scale=1.0: sets the initial zoom level when the page is first loaded by the browser.

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2. Media Queries

Ideal Responsive Layout Using media queries

Notice how some elements are scaled to shrink as browser window reduces in size

When browser shrinks below a certain threshold, then layout and navigation elements change as well.

In this case, the list of hyperlinks changes to a <select> and the two-column design changes to one column

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Defines this as a media query Device has to be a screen CSS rules to use if device matches these conditions

@media only screen and (max-width:480px) { ... }

Only use this style if both conditions are true Use this style if width of viewport is no wider than 480 pixels

```
@media only screen and (max-width:480px)
{
    small {display: none;}
    iframe {max-width: 100%;}
}
```

mediaQ-int.html
seikyung.com/
index.html
index-NoMediaQ.html

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For external CSS files mediaQ-ext1.html
mediaQ-ext2.html

```
<link href="mobile.css" media="screen and (max-width:720px)">
<link href="tablet.css" media="screen and (min-width:721px) and (max-width:960px)">
<link href="desktop.css" media="screen and (min-width:961px)">
```

- CSS media query is a way to apply style rules based on the medium that is displaying the file.
- You can use these queries to look at the capabilities of the device, and then define CSS rules to target that device.
- You can include media queries either external or internal way.

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CSS Classes

- A CSS framework is a pre-created set of CSS classes or other software tools that make it easier to use and work with CSS.
- Grid systems make it easier to create multi-column layouts
 - <https://getbootstrap.com/>
 - https://www.w3schools.com/bootstrap/bootstrap_ver.asp

bootstrap3.html (version 3)
bootstrap4.html (version 4)
bootstrap5.html (version 5)
bootstrap-NO.html

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Bootstrap

- Bootstrap is the most popular, simple, front-end framework for developing responsive websites.
- Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables and many other, as well as optional JavaScript plugins

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Where to get Bootstrap?

- You must either:
 - Download: link to a locally hosted version of the library
 - Use an approved third-party host, such as Google, Microsoft, or bootstrap itself
- Benefits using a third-party content delivery network (CDN)?
 - The bandwidth of the file is offloaded
 - The user may already have cached the third-party file
- Disadvantage to the third-party CDN?
 - Your Bootstrap will fail if the third-party host fails (unlikely)

```
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
```

```
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css">
```

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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:
 - Typically use grids to achieve visual uniformity in a design.

<https://getbootstrap.com/docs/5.3/layout/grid/>

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

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Note that max size is 992px for class **.col-lg-**
It means grid class already include **media** for responsive design

As noted above, each of these breakpoints have their own container, unique class prefix, and modifiers. Here's how the grid changes across these breakpoints:

	xs	sm	md	lg	xl	xxl
	<576px	≥576px	≥768px	≥992px	≥1200px	≥1400px
Container <i>max-width</i>	None (auto)	540px	720px	960px	1140px	1320px
Class prefix	.col-	.col-sm-	.col-md-	.col-lg-	.col-xl-	.col-xxl-
# of columns	12					

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FontAwesome

`<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/6.5.1/css/all.min.css">`

- <https://fontawesome.com/>
- Assignment 1
 - You will need to use **fontAwesome** for menu items (you must NOT have same icons as mine)

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In-class Exercise

- Modify "exercise.html" to integrate "bootstrap.min.css"
 - use viewport
 - use media queries: **@media**
 - use Bootstrap Grid system

Hint: **display:none**

wide screen

smaller screen

smallest screen: no images

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