



CSS Media Queries and Responsive Design

1. Introduction to Responsive Design

- **Definition:** Responsive design ensures web content adapts to various screen sizes, enhancing usability across different devices.
 - **Importance:**
 - Improves user experience across devices.
 - Adapts layouts dynamically for mobile, tablet, and desktop.
 - **Examples:** Web pages that look different on mobile vs. desktop.
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2. Basics of CSS Media Queries

- **Definition:** CSS media queries allow you to apply styles only under specified conditions such as screen width or device type.
- **Syntax:**

```
@media (media-feature: value) {  
  /* CSS rules */  
}
```

- **Common Media Features:**
 - `min-width` / `max-width`
 - `min-height` / `max-height`
 - `orientation` (e.g., `portrait`, `landscape`)
 - `resolution`
- **Using Modifiers:**
 - `all`: Default; applies to all devices.

- **only**: Limits styles to specific devices, used for preventing older browsers from applying styles.
 - **not**: Negates the media query, applying styles to everything except the condition.
- **Example:**

```
@media only screen and (max-width: 600px) {  
  body {  
    background-color: lightblue;  
  }  
}
```

3. Bootstrap 5 Breakpoints Overview

- **Breakpoints in Bootstrap 5:**

Breakpoint	Min-Width	Description
xs	N/A	Extra small (default)
sm	576px	Small devices (phones)
md	768px	Medium devices (tablets)
lg	992px	Large devices (desktops)
xl	1200px	Extra large devices
xxl	1400px	Extra extra large devices

- **Purpose:** Utilize these breakpoints to create responsive layouts that change based on the device size.

4. Writing Media Queries Using Bootstrap Breakpoints

- **Applying Bootstrap Breakpoints:**

```
/* Small devices (≥576px) */  
@media only screen and (min-width: 576px) {  
  /* Styles */  
}  
  
/* Medium devices (≥768px) */
```

```

@media only screen and (min-width: 768px) {
  /* Styles */
}

/* Large devices (≥992px) */
@media only screen and (min-width: 992px) {
  /* Styles */
}

/* Extra large devices (≥1200px) */
@media only screen and (min-width: 1200px) {
  /* Styles */
}

/* Extra extra large devices (≥1400px) */
@media only screen and (min-width: 1400px) {
  /* Styles */
}

```

5. **all**, **only**, and **not** Modifiers Explained

- **all**: Targets all media types by default.

```

@media all and (min-width: 768px) {
  /* Applies to all types of devices at or above 768px */
}

```

- **only**: Used to limit the style application to specific devices.

```

@media only screen and (max-width: 600px) {
  /* Applies only to screens with max-width of 600px */
}

```

- **not**: Excludes styles for the specified condition.

```

@media not screen and (min-width: 1200px) {
  /* Applies to all devices except screens ≥1200px */
}

```

```
}
```

6. Two Approaches to Writing Media Queries

Approach 1: Initial CSS for Small Devices

- **Strategy:** Start with base styles optimized for smaller screens (mobile-first), and use media queries for larger breakpoints.
- **Example:**

```
/* Base styles for small devices (default) */
body {
    font-size: 14px;
    padding: 10px;
}

/* Medium devices (≥768px) */
@media only screen and (min-width: 768px) {
    body {
        font-size: 16px;
        padding: 20px;
    }
}

/* Large devices (≥992px) */
@media only screen and (min-width: 992px) {
    body {
        font-size: 18px;
        padding: 30px;
    }
}

/* Extra large devices (≥1200px) */
@media only screen and (min-width: 1200px) {
    body {
        font-size: 20px;
        padding: 40px;
    }
}
```

```

}

/* Extra extra large devices (≥1400px) */
@media only screen and (min-width: 1400px) {
  body {
    font-size: 22px;
    padding: 50px;
  }
}

```

Approach 2: Initial CSS for Large Devices

- **Strategy:** Start with styles for larger devices and adjust for smaller breakpoints using media queries.
- **Example:**

```

/* Base styles for large devices (≥992px) */
body {
  font-size: 20px;
  padding: 40px;
}

/* Medium devices (≥768px and <992px) */
@media only screen and (max-width: 991.98px) {
  body {
    font-size: 18px;
    padding: 30px;
  }
}

/* Small devices (≥576px and <768px) */
@media only screen and (max-width: 767.98px) {
  body {
    font-size: 16px;
    padding: 20px;
  }
}

```

```
/* Extra small devices (<576px) */
@media only screen and (max-width: 575.98px) {
  body {
    font-size: 14px;
    padding: 10px;
  }
}
```

7. Best Practices for Media Queries

- **Tips:**
 - **Use Mobile-First Approach:** Prioritize smaller screens and scale up.
 - **Keep Styles DRY:** (Do Not Repeat Yourself) Avoid redundancy.
- **Example:**

```
@media only screen and (min-width: 768px) and (orientation: landscape) {
  /* Styles for landscape on medium and larger devices
  */
}
```