Week 3

HTML Responsive Web Design

HTML Responsive Web Design is a smart way of designing web pages to look great on any device. It's all about making HTML elements adjust themselves, like resizing or hiding, based on the device's screen size. This ensures that no matter if someone's using a phone, tablet, or computer, the web pages will always look good.

Examples of HTML Responsive Web Design

- HTML Viewport meta tag for Responsive Web Design
- Responsive Images
- Responsive Texts
- CSS media Queries
- Responsive Layouts

1. HTML Viewport meta tag for Responsive Web Design

The [HTML viewport](#) is the visible area of the screen that users see. It changes depending on the device being used. With this approach, we set the width of web pages to match the available screen width, making it 100%. This helps content adapt and look good on any device, ensuring a responsive layout.

Syntax

```
<meta name="viewport" content= "width=device-width, initial-scale=1.0">
```

Example: Use of the HTML viewport meta tag for responsive pages.

HTML

```
<!DOCTYPE html>

<html>


<head>

    <title>GeeksforGeeks</title>

    <meta charset="utf-8"

          name="viewport"

          content="width=device-width,

                initial-scale=1.0" />

    <style>
```

```css
        .gfg {

            font-size: 40px;

            font-weight: bold;

            color: green;

            text-align: center;

        }


        .geeks {

            font-size: 17px;

            text-align: center;

        }


        p {

            text-align: justify;

        }

    </style>

</head>


<body>

    <div class="gfg">GeeksforGeeks</div>

    <div class="geeks">HTML Introduction</div>


    <p>

        HTML stands for HyperText Markup Language. It is

        used to design web pages using a markup

        language. HTML is a combination of Hypertext and

        Markup language. Hypertext defines the link

        between web pages. A markup language is used to
```

```
        define the text document within the tag which

        defines the structure of web pages. This

        language is used to annotate (make notes for the

        computer) text so that a machine can understand

        it and manipulate text accordingly. Most markup

        languages (e.g. HTML) are human-readable. The

        language uses tags to define what manipulation

        has to be done on the text.

    </p>
</body>


</html>
```

Output

GeeksforGeeks

HTML Introduction

HTML stands for HyperText Markup Language. It is used to design web pages using a markup language. HTML is a combination of Hypertext and Markup language. Hypertext defines the link between web pages. A markup language is used to define the text document within the tag which defines the structure of web pages. This language is used to annotate (make notes for the computer) text so that a machine can understand it and manipulate text accordingly. Most markup languages (e.g. HTML) are human-readable. The language uses tags to define what manipulation has to be done on the text.

2. Responsive Images

Responsive images play a key role in responsive websites. These are images that can adjust their size, getting bigger or smaller, based on the width of the browser. By being responsive, images enhance user experience across different devices with varying screen sizes. The following are the techniques to use the responsive images:

2.1 Using width Property

The image can be responsive & scale up & down with the help of CSS width property by setting its value as 100%.

Syntax

```
<img src="..." style="width:100%;">
```

Example: In this example, we will use the image width property to occupy 100% of the screen width.

HTML

```html
<!DOCTYPE html>
<html>

<head>
    <meta name="viewport" content=
        "width=device-width, initial-scale=1.0" />
</head>

<body>
    <img class=".img-fluid" src=
"https://media.geeksforgeeks.org/wp-content/uploads/20220201191443/logo-
200x32.png"
        style="width: 100%" />

    <h2>Responsive Images</h2>

    <p>
        Responsive images are just a part of Responsive
        websites. Images that can change their
        dimensions, scaling them up or down, according
        to the browser width are responsive images. The
        above image is responsive as it is adjusting
        itself according to the width of the browser.
    </p>
</body>

</html>
```

Output

Responsive Images

Responsive images are just a part of Responsive websites. Images that can change their dimensions, scaling them up or down, according to the browser width are responsive images. The above image is responsive as it is adjusting itself according to the width of the browser.

2.2 Using the max-width Property

The max-width property sets the maximum width of an element. It restricts the element's width from exceeding a certain value. If the content is larger than this maximum width, it wraps to the next line. However, if the content is smaller, the property has no impact. Also, if the content is larger than its original size, it won't scale up beyond the specified max-width.

Syntax:

```
<img src="..." style="max-width:100%; height:auto;">
```

Example: Implementation of the max-width Property for making the Responsive Images

HTML

```
<!DOCTYPE html>
<html>

<head>
    <meta name="viewport"
          content="width=device-width,
                   initial-scale=1.0" />
</head>

<body>
    <img class=".img-fluid"
         src=
"https://media.geeksforgeeks.org/wp-content/uploads/20220201191443/logo-200x32.png"
         style="max-width:100%;
                height:auto;" />
    <h2>Responsive Images</h2>
    <p>
        Responsive images are just a part of Responsive
        websites. Images that can change their
```
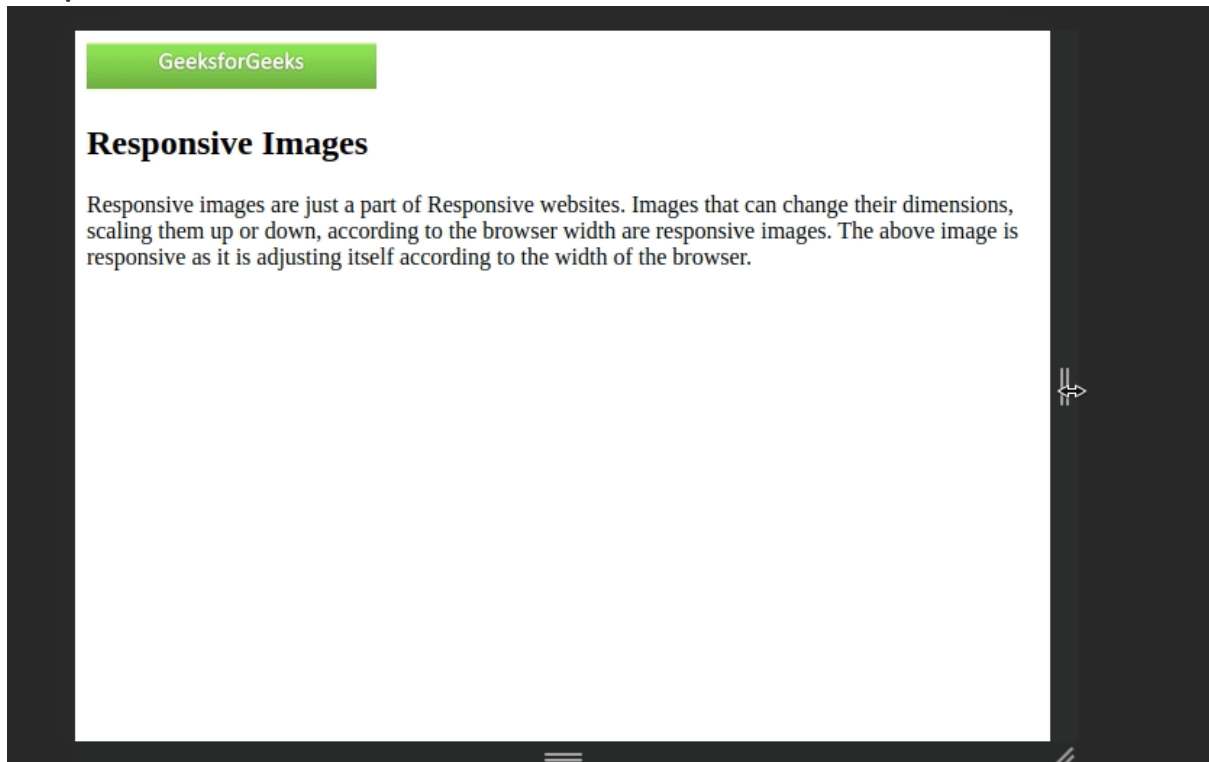
```
        dimensions, scaling them up or down, according
        to the browser width are responsive images. The
        above image is responsive as it is adjusting
        itself according to the width of the browser.
    </p>
</body>

</html>
```

Output

2.3 Responsive Image for different Browser Width

To make images responsive, HTML provides the <picture> element. It gives web developers the flexibility to specify different image resources depending on the size of the browser window

Example
HTML

```
<!DOCTYPE html>
<html>

<head>
    <title>HTML Responsive Web Design</title>
</head>

<body style="text-align: center;">
    <h1 style="color: green;">GeeksforGeeks</h1>

    <h2>HTML picture Tag</h2>
```

```
    <picture>
        <source media="(min-width: 700px)"
                srcset=
"https://media.geeksforgeeks.org/wp-content/uploads/20190825000042/geeks-
221.png">

        <source media="(min-width: 450px)"
                srcset=
"https://media.geeksforgeeks.org/wp-
content/uploads/20190802021607/geeks14.png">

        <img src=
"https://media.geeksforgeeks.org/wp-
content/uploads/20190808102629/geeks15.png"
                alt="GFG">
    </picture>
</body>

</html>
```
Output

3. Responsive Texts

In this method, we set font sizes using %, vw, vh, etc. This ensures that text sizes are responsive, adjusting automatically until reaching a certain limit. Once the limit is reached, the content is justified to fit within the available width.

Example: This example demonstrates Responsive Web Design by making Responsive Texts.

HTML

```html
<!DOCTYPE html>
<html>

<head>
    <style>
        body {
            max-width: 100%;
        }

        .gfg {
            font-size: 7vw;
            font-weight: bold;
            color: green;
            text-align: center;
        }

        .geeks {
            font-size: 5vw;
            text-align: center;
        }

        p {
            font-size: 3vw;
            text-align: justify;
        }
    </style>
</head>

<body>
    <div class="gfg">GeeksforGeeks</div>
    <div class="geeks">HTML Introduction</div>

    <p>
        HTML stands for HyperText Markup Language. It is
        used to design web pages using a markup
        language. HTML is a combination of Hypertext and
        Markup language. Hypertext defines the link
        between web pages. A markup language is used to
        define the text document within the tag which
        defines the structure of web pages. This
        language is used to annotate (make notes for the
        computer) text so that a machine can understand
        it and manipulate text accordingly. Most markup
        languages (e.g. HTML) are human-readable. The
        language uses tags to define what manipulation
        has to be done on the text.
    </p>
</body>
```

```
</html>
```

Output:

GeeksforGeeks
HTML Introduction

HTML stands for HyperText Markup Language. It is used to design web pages using a markup language. HTML is a combination of Hypertext and Markup language. Hypertext defines the link between web pages. A markup language is used to define the text document within the tag which defines the structure of web pages. This language is used to annotate (make notes for the computer) text so that a machine can understand it and manipulate text accordingly. Most markup languages (e.g. HTML) are human-readable. The language uses tags to define what manipulation has to be done on the text.

4. CSS media Queries

The Media query in CSS is essential for crafting responsive web designs. It ensures that web pages adapt to various screen sizes and device types. Breakpoints are set to define when the content starts to adjust or change layout based on the device's width.

Media queries can be used to check many things:

- width and height of the viewport
- width and height of the device
- Orientation
- Resolution

Syntax
```
@media not | only mediatype and (expression) {
    // Code content
}
```

Example: In this example, we will use screen size in a media query to make the webpage responsive according to different breakpoints.

HTML
```
<!DOCTYPE html>
<html>

<head>
    <title>GeeksforGeeks</title>
```

```html
    <style>
        .gfg {
            font-size: 100px;
            font-weight: bold;
            color: green;
            text-align: center;
        }

        .geeks {
            font-size: 50px;
            text-align: center;
        }

        p {
            font-size: 25px;
            text-align: justify;
        }

        /* styling for screen width less than 800 */
        @media screen and (max-width: 800px) {
            body {
                background-color: aqua;
            }

            .gfg {
                font-size: 50px;
            }

            .geeks {
                font-size: 25px;
            }

            p {
                font-size: 12px;
            }
        }
    </style>
</head>

<body>
    <div class="gfg">GeeksforGeeks</div>
    <div class="geeks">HTML Introduction</div>

    <p>
        HTML stands for HyperText Markup Language. It is
        used to design web pages using a markup
        language. HTML is a combination of Hypertext and
        Markup language. Hypertext defines the link
        between web pages. A markup language is used to
        define the text document within the tag which
        defines the structure of web pages. This
```
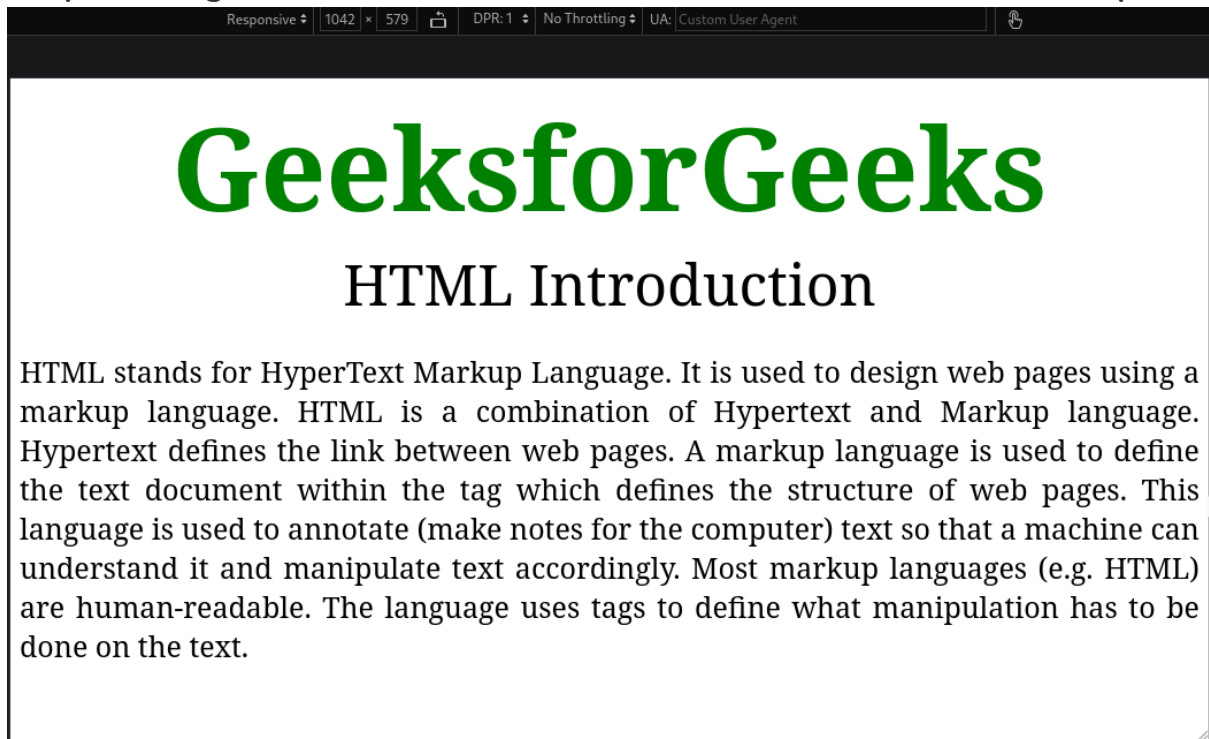
```
        language is used to annotate (make notes for the
        computer) text so that a machine can understand
        it and manipulate text accordingly. Most markup
        languages (e.g. HTML) are human-readable. The
        language uses tags to define what manipulation
        has to be done on the text.
    </p>
</body>

</html>
```

Output: Background color and font size transition for width less than 800px.

GeeksforGeeks
HTML Introduction

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Note: Sometimes, this method doesn't show the correct output on Google Chrome.

5. Responsive Layouts

The responsive layout module of CSS includes the following properties.

5.1 Using flexbox property

In this approach, we will use CSS display property to make the page responsive. Display layouts like flexbox, inline, blocks, and grids can be used to make the design responsive. CSS flexbox property auto adjusts the content (no. of columns in a row) according to the screen width as shown in the output gif.

Syntax

```
.container{
    display: flexbox;
}
```

Example: In this example, we will use display type flexbox to show adjust items automatically according to the screen size.

HTML

```html
<!DOCTYPE html>
<html>

<head>
    <title>GeeksforGeeks</title>
    <style>
        body {
            background-color: aqua;
        }
        .gfg {
            font-size: 5vw;
            font-weight: bold;
            color: green;
            text-align: center;
        }
        button {
            width: 300px;
            font-size: larger;
        }
        .container {
            display: flexbox;
        }
    </style>
</head>

<body>
    <div class="gfg">GeeksforGeeks</div>
    <div class="container">
        <button>HTML</button>
        <button>CSS</button>
        <button>JavaScript</button>
    </div>
</body>

</html>
```
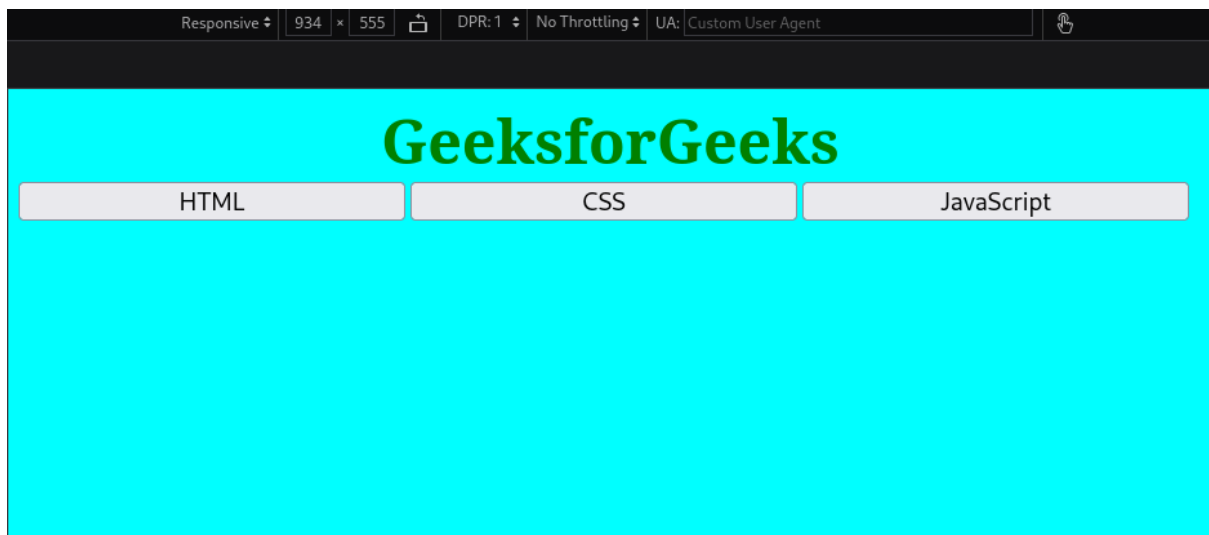
Output

Note: Sometimes, this method doesn't show the correct output on Google Chrome.

5.2 Using CSS Grids

This approach uses a [CSS display grid](#) to create a 2D layout along with other grid options. It allows us to decide the number of columns we want to keep and instead of rearranging the columns like Flexbox, it adjusts the content within individual column elements.

Syntax

```css
.container{
    display: grid;
     /* To define colums*/
    grid-template-columns: 1fr 1fr;
}
```

Example: In this example, CSS Grid layout is used to arrange contents in 2D form, i.e., rows and columns.

HTML

```html
<!DOCTYPE html>
<html>

<head>
    <title>GeeksforGeeks</title>
    <style>
        body {
            background-color: aqua;
        }
        .gfg {
            font-size: 5vw;
            font-weight: bold;
            color: green;
            text-align: center;
        }

        .container {
```

```
            font-size: x-large;
            text-align: center;
            display: grid;
            grid-template-columns: 1fr 1fr;
        }
        .grid-item {
            background-color: rgb(220, 208, 232);
            border: 2px solid rgb(70, 54, 84);
        }
    </style>
</head>

<body>
    <div class="gfg">GeeksforGeeks</div>
    <div class="container">
        <div class="grid-item">HTML</div>
        <div class="grid-item">CSS</div>
        <div class="grid-item">JavaScript</div>
        <div class="grid-item">Bootstrap</div>
    </div>
</body>

</html>
```

Output

Note: Sometimes, this method doesn't show the correct output on Google Chrome.

5.3 Using CSS MultiColumn

It is similar to grids. CSS MulotiColumn allows developers to choose the properties like no. of columns, width, gap, etc. for each column. These values remain unchanged but the content inside the columns adjusts.

Syntax

```
.container{
    column-count: 3;                        /* Number of
columns*/
```

```
    column-gap: 20px;                          /* Gap between columns*/
    column-width: 200px;                  /* Width of each column*/
    /* Other column properties*/
}
```

Example: This example uses CSS MultiColumn for content division into a specific number of columns.

HTML

```html
<!DOCTYPE html>
<html>

<head>
    <title>GeeksforGeeks</title>
    <style>
        body {
            background-color: aqua;
        }
        .gfg {
            font-size: 5vw;
            font-weight: bold;
            color: green;
            text-align: center;
        }

        .container {
            font-size: x-large;
            text-align: left;
            column-count: 3;
            column-gap: 5%;
        }
    </style>
</head>

<body>
    <div class="gfg">GeeksforGeeks</div>
    <div class="container">
        <div>
            HTML stands for HyperText Markup Language.
            It is used to design web pages using a
            markup language. HTML is a combination of
            Hypertext and Markup language. Hypertext
            defines the link between web pages. A markup
            language is used to define the text document
            within the tag which defines the structure
            of web pages. This language is used to
            annotate (make notes for the computer) text
            so that a machine can understand it and
            manipulate text accordingly. Most markup
            languages (e.g. HTML) are human-readable.
            The language uses tags to define what
            manipulation has to be done on the text.
```
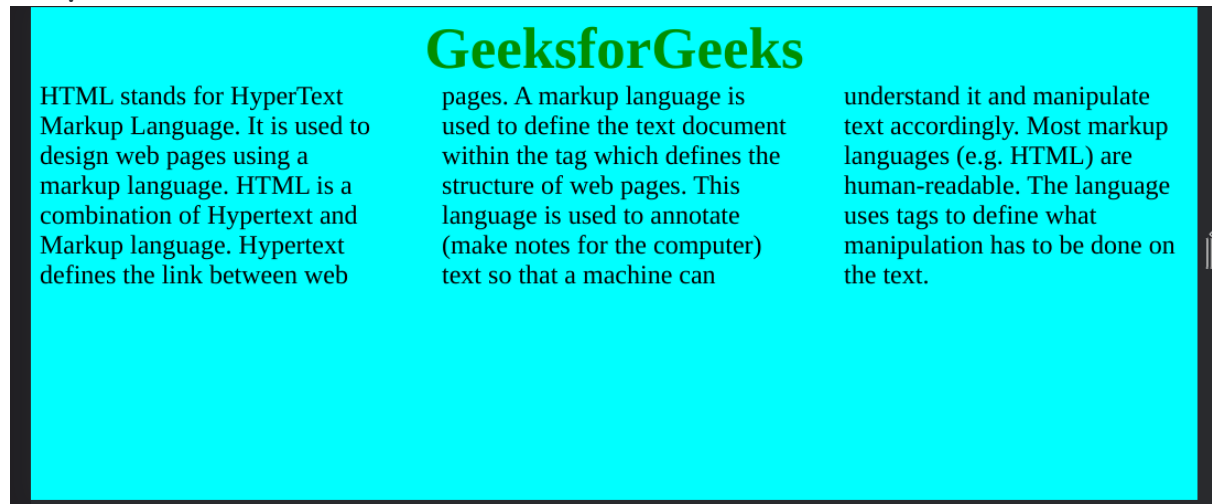
```
            </div>
        </div>
</body>

</html>
```

Output

HTML Responsive Web Design allows websites to adapt to various screen sizes, ensuring a seamless user experience across devices. By using HTML and responsive techniques, designers and developers can create websites that look great whether viewed on a desktop or a smartphone. This flexibility enhances accessibility and usability, making browsing a breeze for all users. In essence, HTML Responsive Web Design is crucial for ensuring that websites remain functional and visually appealing regardless of the device being used.