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CSS

MODULE 5 / UNIT 5 / 0.4

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FUNDAMENTALS OF COMPUTER ENGINEERING

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CSS Fundamentals

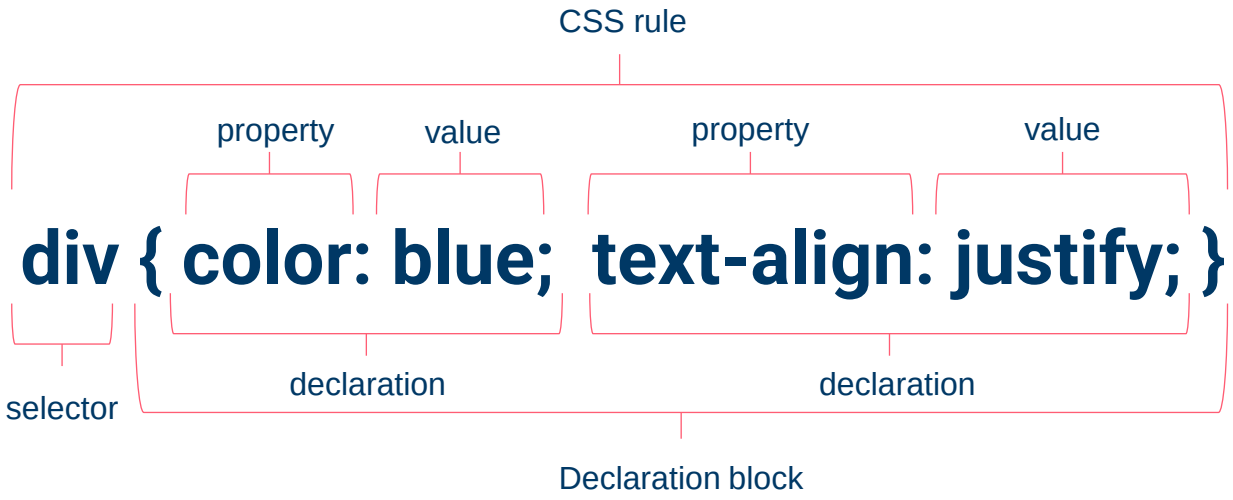
01

CSS Fundamentals

CSS (Cascading Style Sheets) is the language that defines the style of the elements of an HTML document in order to control the design, the appearance of our web pages made with HTML.

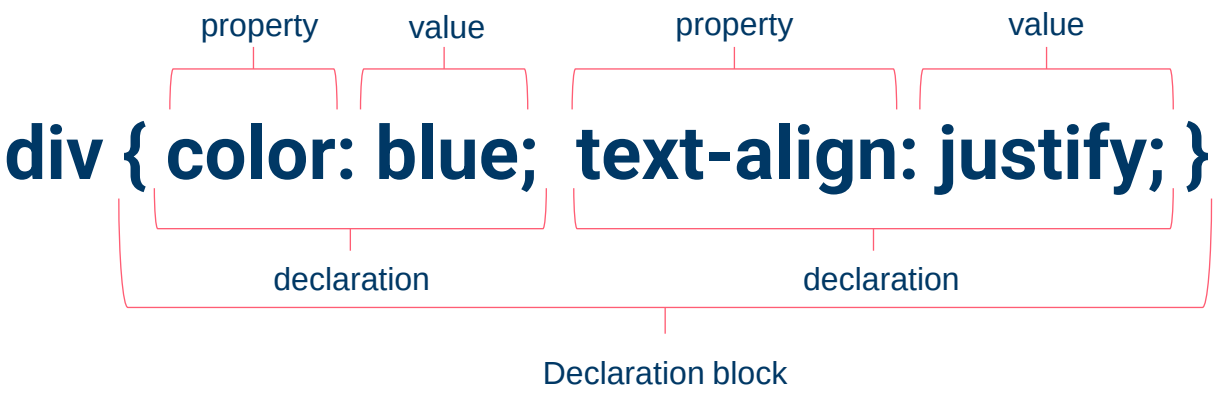
- It is an easy language to understand and learn, but it gives robust control on the presentation of HTML documents
- it specifies how the different HTML elements or tags to be presented on the screen.
- It is a language designed to save time, offline browsing, fast page load.

Style are defined as rules where each rule consists of two parts:



- The selector defines which HTML element or elements will be styled.
- The declaration defines the different formatting commands applied to the HTML elements.

Declaration block is composed of different declaration, where each one declaration is composed of two elements:



- Property which defines the command to apply over the selector.
- Value which defines the value of the property.

CSS Fundamentals

CSS can be incorporated into HTML documents in three different ways:

- Inline: CSS can be applied directly to HTML elements using the style attribute within the element itself.
- Internal: CSS can be added within the <style> element, which is placed in the <head> section of the HTML document.
- External: CSS can be linked to the HTML document using a <link> element, which references an external CSS file.

The most common and recommended approach is to maintain styles in one or more external CSS files to keep the HTML code clean, manageable, and easier to maintain and reuse

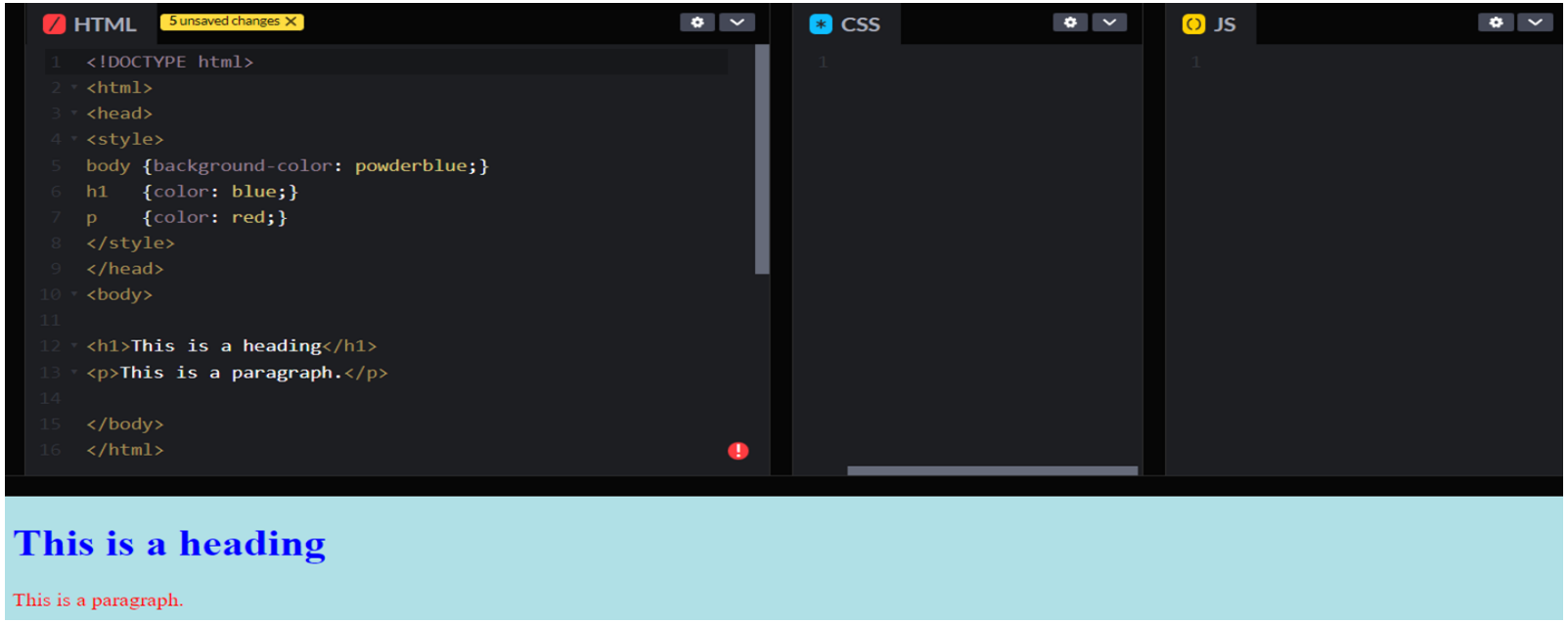
Inline CSS

Inline CSS is used to apply a specific style to a single HTML element. This mode uses the style attribute of an HTML element.

The example sets the text color of the <h1> element to red, and the text color of the <p> element to orange.

Internal CSS

Internal CSS is used to define a style for a single HTML page. This mode uses the <head> section of an HTML page, within a <style> element.



The example sets some styles to the html tags.

External CSS

External CSS is used to define the style for many HTML pages. This mode uses an external style sheet, add a link to it in the <head> section of each HTML page.

The file link the CSS file styles.css where the different styles are defined.

External CSS (link tag)

```
1 <link href="main.css" rel="stylesheet" type="text/css" />
```

The <link> tag defines the relationship between the current document and an external resource like a css file. The main properties of link tag are defined next:

- href: it specifies the location of the linked document.
- hreflang: it specifies the language of the text in the linked document.
- media: it specifies on what device the linked document will be displayed.
- rel (required): it specifies the relationship between the current document and the linked document.
- type: it specifies the media type of the linked document.

CSS elements

02

CSS selectors

CSS selectors are used to define the HTML elements we want to style. These are divided into five categories:

- Name selectors
- Id selectors
- Class selectors
- Grouping Selector
- Pseudo-class selectors

Simple selectors

This type of selector is applied to specific HTML elements based on the element name.

```
p {
  text-align: center;
  color: orange;
}
```

We have applied two styles to the <p> element. This means that these styles will be applied to all <p> tags throughout the document.

Id selectors

This type of selector is applied to specific HTML elements based on the id attribute of the element.

IDs are preceded by the # symbol.

```css
#id1 {
  text-align: center;
  color: red;
}
```

We need to include an id attribute in the HTML tag to apply the style, like this:

```html
<h1 id = "id1">This is a heading</h1>
```

Class selectors

This type of selector is applied to specific HTML elements based on the class attribute of the element. Classes are preceded by the . symbol.

```
1 .center {
2   text-align: center;
3   color: red;
4 }
```

We need to include an class attribute in the HTML tag to apply the style, like this:

```
1 <h1 class = "center">This is a heading</h1>
```

Grouping selectors

This type of selector is applied to a group of HTML elements based on their class, id, or element name.

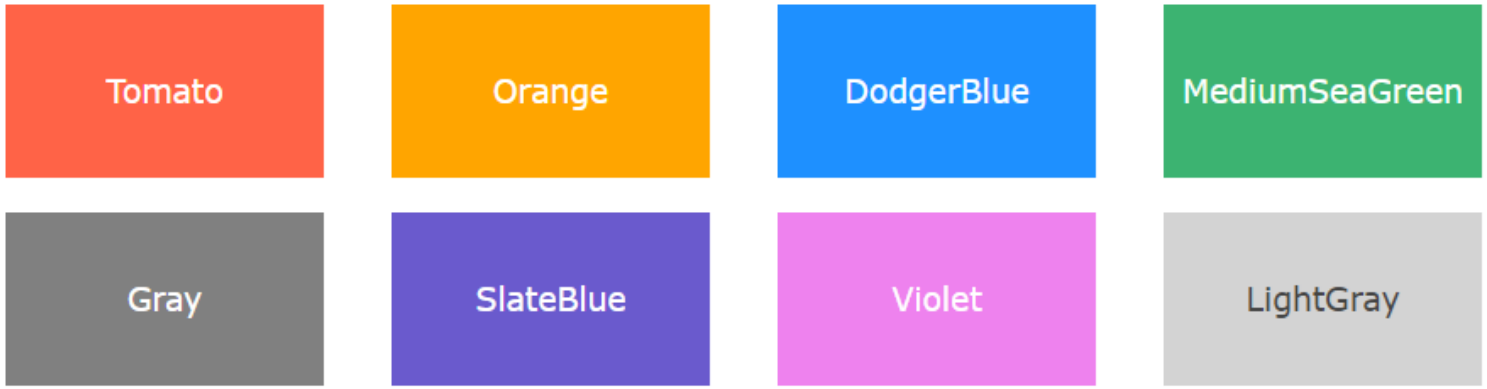
```
1 h1, h2, p {
2   text-align: center;
3   color: red;
4 }
```

The selectors h1, h2, and p are separated by commas, indicating that the following styles should be applied to all of these elements.

CSS colours

CSS provides various methods to modify the colour of HTML elements, allowing you to customize the appearance of your webpage.

- Background Color
- Text Color
- Border Color
- Color Values

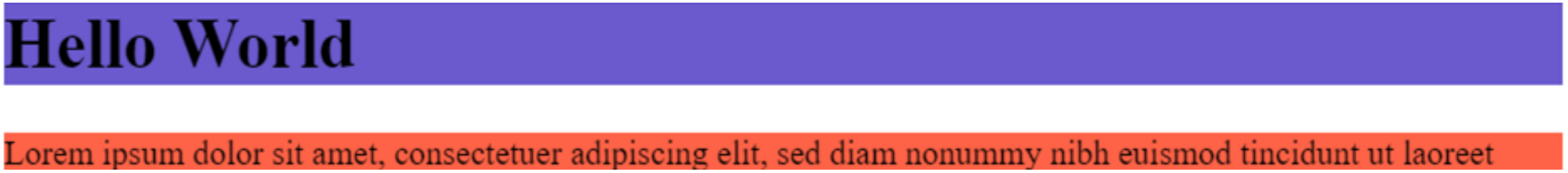


In CSS, a colour can be specified using one of the 140 predefined standard colour names. These colour names are recognized across all modern browsers and allow you to apply colours directly by name, such as red, blue, green or slateblue.

CSS colours – background color

The background-color property in CSS defines the background color of an HTML element allowing us to set a solid color behind the content of an element.

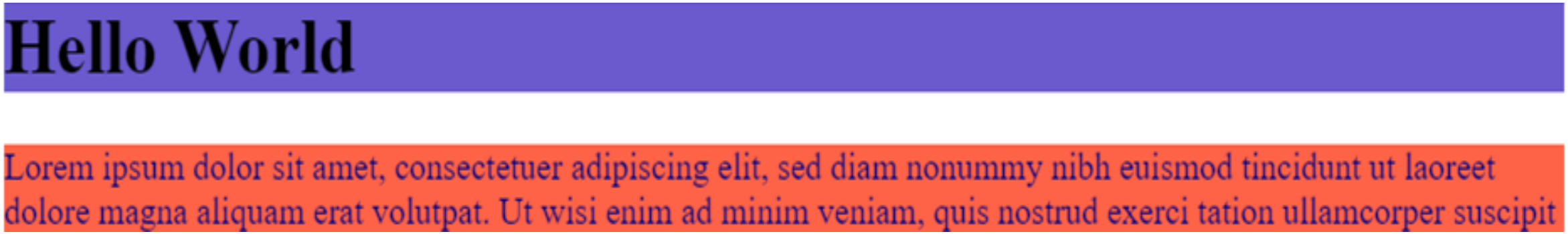
```html
<html>
  <body>
    <h1 style="background-color: SlateBlue;">Hello World</h1>
    <p style="background-color: Tomato;">Lorem ipsum ..... </p>
  </body>
</html>
```



CSS colours – text color

The color property in CSS defines the text color for an HTML element.

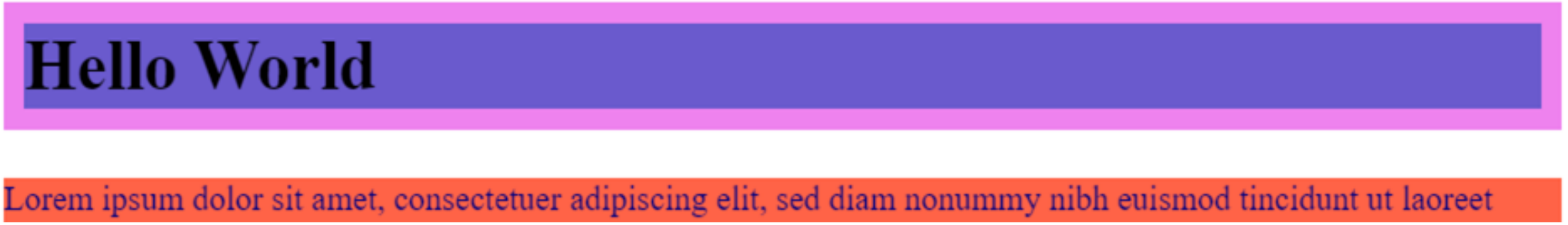
```html
<html>
    <body>
        <h1 style="background-color: SlateBlue;">Hello World</h1>
        <p style="background-color: Tomato; Tomato;color: navy;">Lorem ipsum …… </p>
    </body>
</html>
```



CSS colours – border color

The border-color property in CSS defines the color of the borders for an HTML element allowing us to specify the color of the border around an element,

```html
<html>
    <body>
        <h1 style="background-color: SlateBlue; border:10px solid Violet;">Hello World</h1>
        <p style="background-color: Tomato; Tomato;color: navy;">Lorem ipsum …… </p>
    </body>
</html>
```



CSS colours – color values

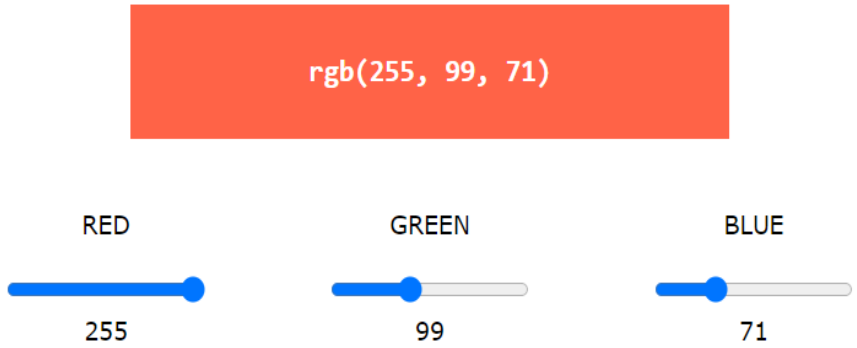
CSS provides several ways to specify colors, offering flexibility and precision in defining the appearance of HTML elements.

```html
<html>
    <body>
        <h1 style="background-color:rgb(255, 99, 71); border:10px solid Violet;">Hello World</h1>
        <p style="background-color: Tomato; Tomato;color: navy;">Lorem ipsum …… </p>
    </body>
</html>
```

CSS colours – color values (RGB)

An RGB color value represents a combination of RED, GREEN, and BLUE light sources.

rgb(red, green, blue)

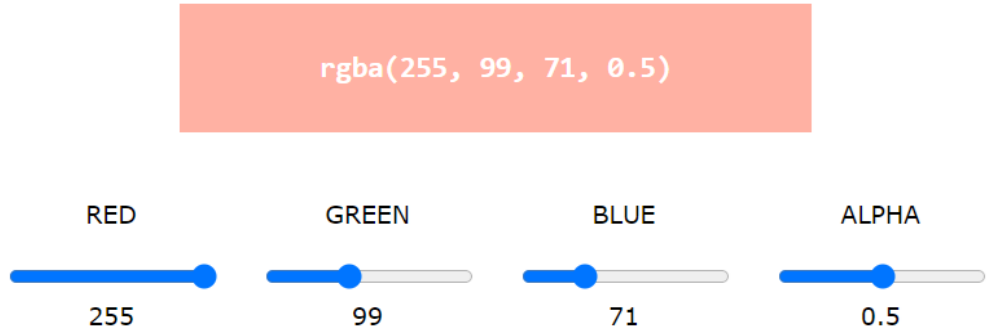


Each parameter (red, green, and blue) specifies the intensity of the respective color, with values ranging from 0 to 255. A value of 0 means no contribution of that color, while 255 represents the maximum intensity of the color.

CSS colours – color values (RGBA)

RGBA color values are an extension of RGB color values that include an alpha channel, which specifies the opacity of the color. RGBA allows you to create colors with varying levels of transparency.

rgb(red, green, blue, alpha)



The alpha parameter defines the opacity of the color and is a number between 0.0 and 1.0:

- 0.0 represents full transparency, making the color completely invisible.
- 1.0 represents full opacity, making the color completely solid.

CSS fonts

CSS provides various ways to modify the style and weight of fonts, allowing you to customize the appearance of text on your webpage.

The basic font-style are normal, italic and bold:

```
1 p { font-style: normal; }
2 p { font-style: italic; }
```

The font-weight property in CSS enables you to control the thickness of text. It accepts values such as normal, bold, bolder, lighter, or a numeric value ranging from 100 to 900.

```
1 p {font-style: italic; font-weight: bold;}
```

CSS fonts

The font-family property in CSS is used to specify the typeface that should be applied to the text within an HTML element.

```
1 p { font-family: "Times New Roman", Georgia, Serif;}
```

The font-size property in CSS is used to control the size of the text within an HTML element.

```
1 p { font-family: "Times New Roman", Georgia, Serif; font-size: 30px;}
```

The font-size property can be defined using several units, including pixels (px), percentages (%), ems (em), and rems (rem),

CSS fonts sizes

Relative length units are used to specify sizes that are relative to another length, such as the font size of an element or the viewport dimensions.

- px: One device pixel (dot) of the display. (1px is equal to 1/96th of 1in)
- mm: One millimeter.
- cm: One centimeter (10 millimeters).
- in: One inch (2.54 centimeters).
- pt: One point (which is 1/72 of an inch).
- pc: One pica (which is 12 points).

Absolute length units in CSS, such as px, pt, cm, mm, and in, are typically best suited for scenarios where precise control over dimensions is required

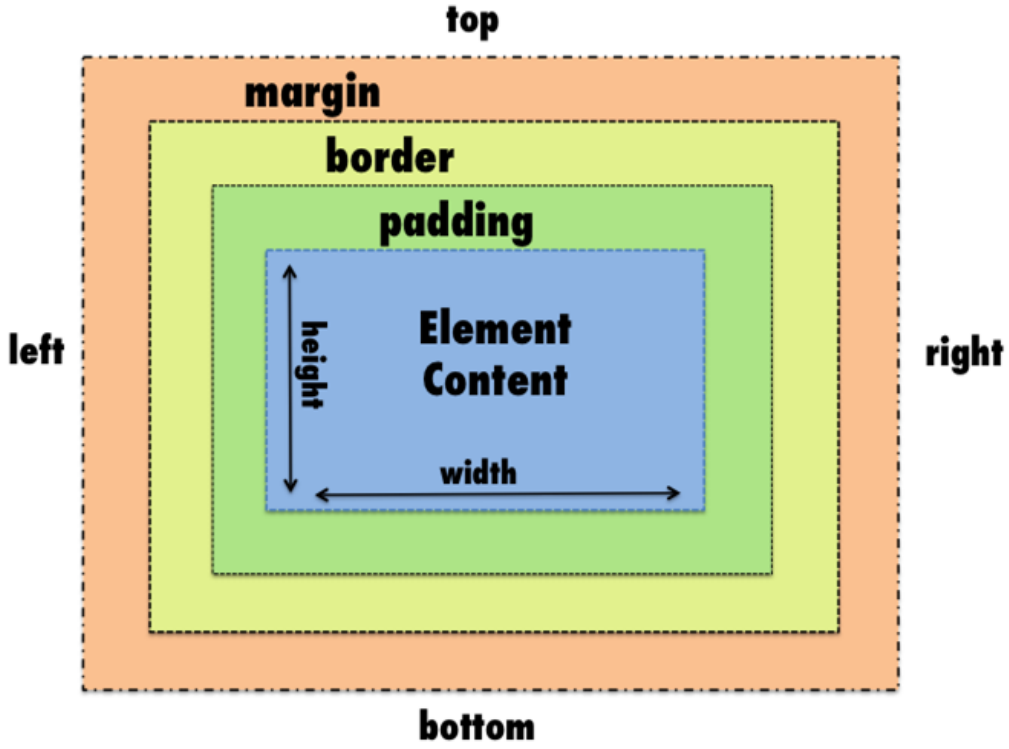
CSS boxes

03

CSS boxes

The CSS box model is a fundamental concept that describes how every HTML element is treated as a rectangular box in order to define the space an element occupies on a webpage and how its size is calculated. The box model is composed of four main components:

- Content
- Padding
- Border
- Margin

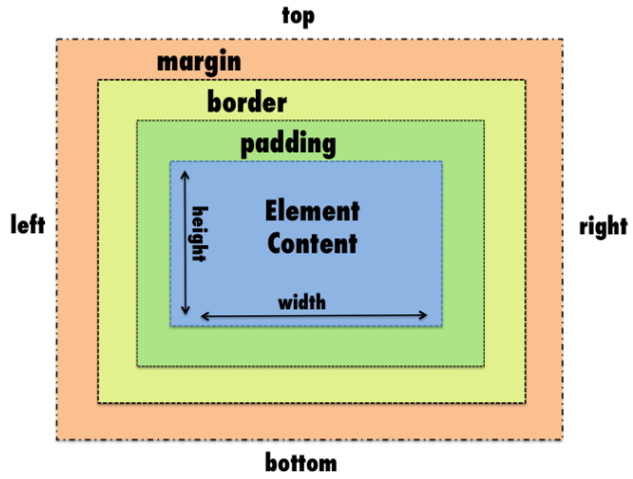


Padding

Padding is the space between the content area and the border creating space inside the element, around the content.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce aliquam tellus vel enim pulvinar pharetra. Vivamus vitae mauris ultricies, elementum magna at, semper libero. In hac habitasse platea dictumst.

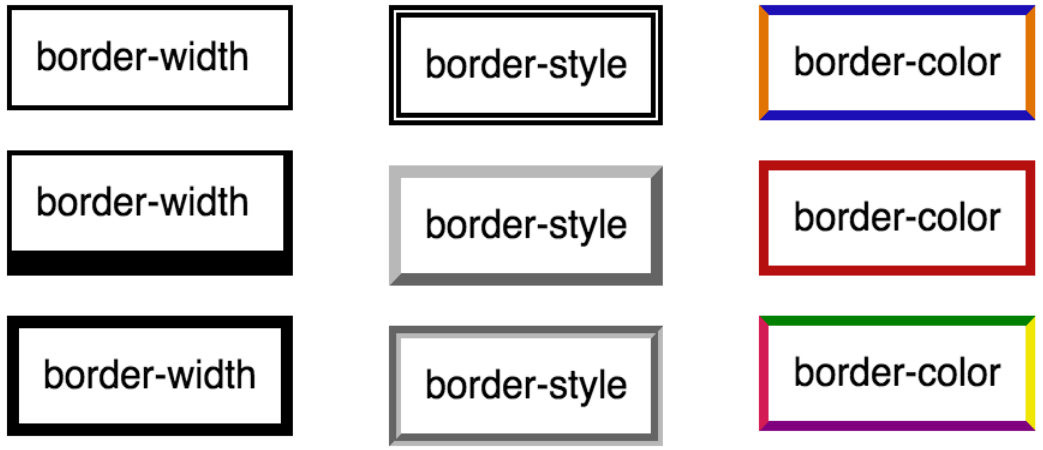
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce aliquam tellus vel enim pulvinar pharetra. Vivamus vitae mauris ultricies, elementum magna at, semper libero. In hac habitasse platea dictumst.

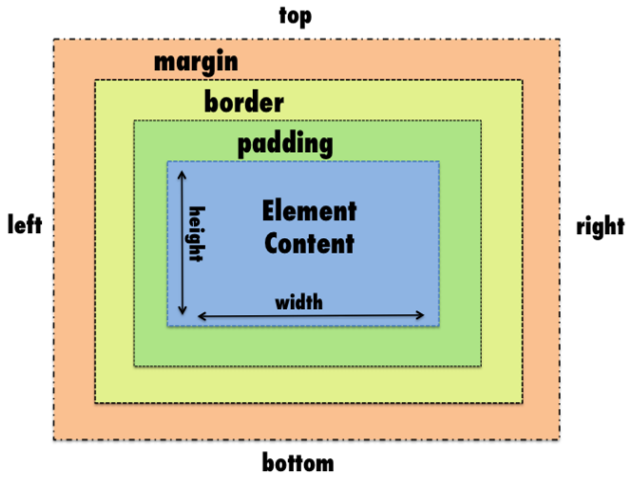


Padding can be specified individually for each side (top, right, bottom, left) or uniformly for all sides.

Border

The border wraps around the padding (if any) and content. It forms the outer edge of the element's box and can be customized in terms of thickness (width), style, and color.





Width defines the thickness of the border, style determines the style or pattern of the border (solid, dashed, etc) and color sets the color of the border (color name, rgb(255, 0, 0) or hex value like #ff0000).

Border

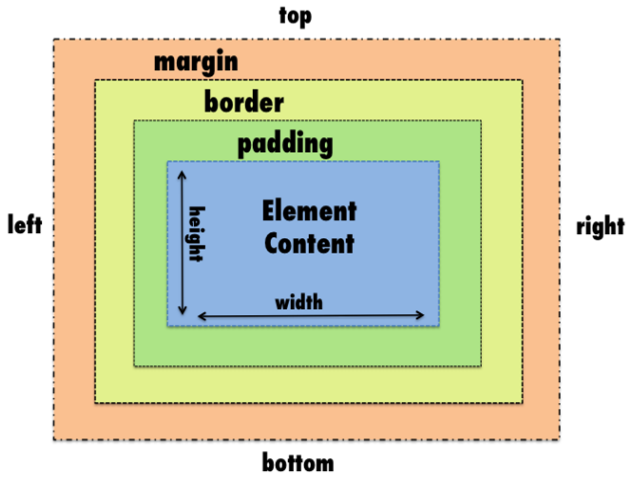
The margin is the outermost layer of the box, creating space between the element and other elements on the page.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce aliquam tellus vel enim pulvinar pharetra.

Vivamus vitae mauris ultricies, elementum magna at, semper libero. In hac habitasse platea dictumst.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce aliquam tellus vel enim pulvinar pharetra.

Vivamus vitae mauris ultricies, elementum magna at, semper libero. In hac habitasse platea dictumst.



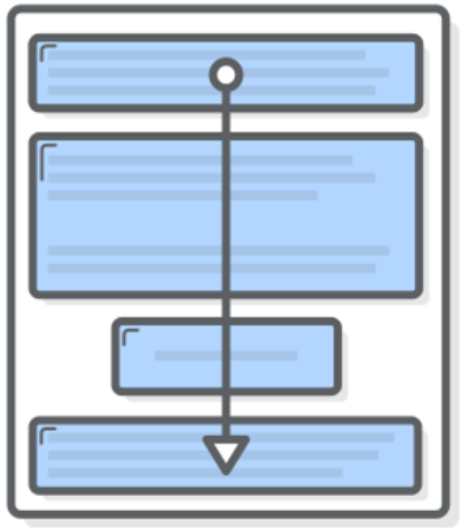
Margins are used to control the spacing between elements and can also be specified individually for each side or uniformly for all sides.

CSS – floating boxes

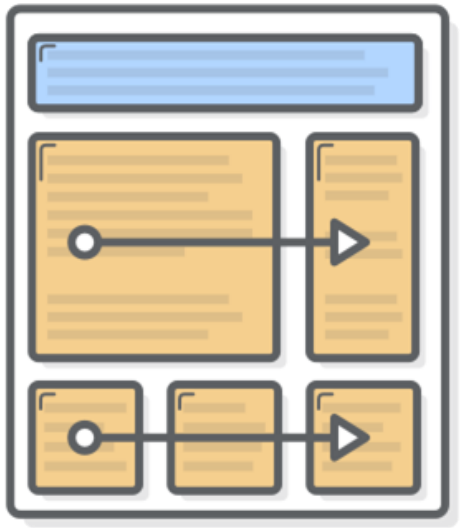
04

CSS – Floating boxes

Web pages are structured using block elements that are designed to adapt to the size of the screen or device where they are viewed.



Vertical flow



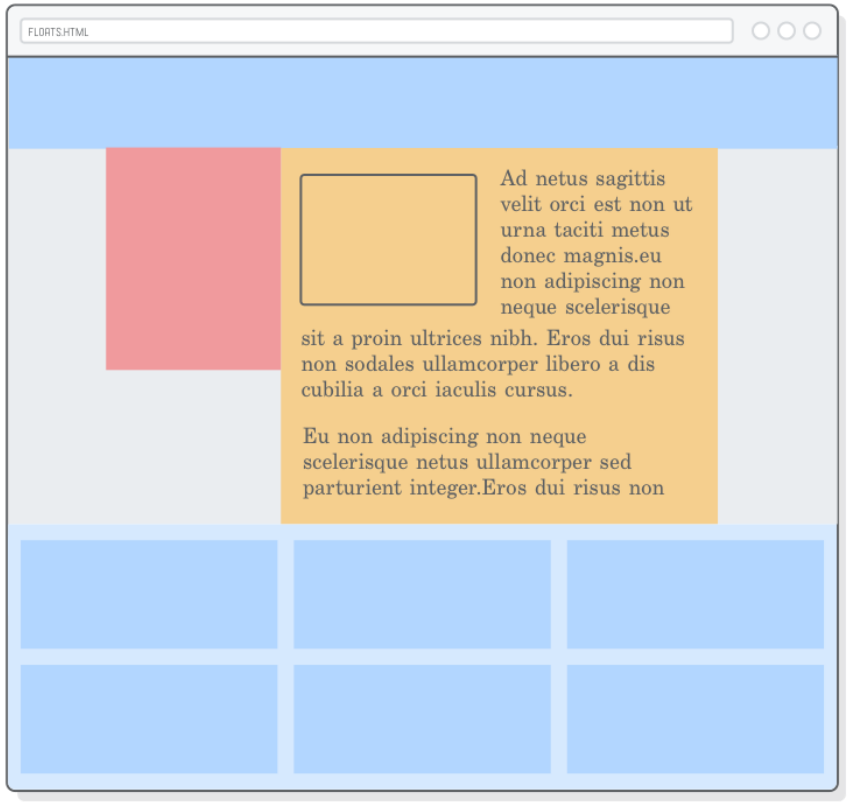
Horizontal flow

These block elements can be arranged either vertically or horizontally, depending on the flow model we define in the CSS.

CSS – Floating boxes

The **float** technique allows you to position block-level elements side-by-side instead of stacking them on top of each other. This feature enables the creation of different types of layouts, including:

- Sidebars
- Multi-column pages
- Grids
- Text and tables
- Images



How to float information

```html
<!DOCTYPE html>
<html lang='en'>
  <head>
    <meta charset='UTF-8' />
    <title>Floats</title>
    <link rel='stylesheet' href='styles.css'/>
  </head>
  <body>
    <div class='page'>
      <div class='header'>Header</div>
      <div class='menu'>Menu</div>
      <div class='content'>Content</div>
      <div class='footer'>Footer</div>
    </div>
  </body>
</html>
```

CSS – Floating boxes

How to float information

```css
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
.header {
  height: 100px;
  background-color: #B2D6FF;    /* Medium blue */
}
.menu {
  height: 300px;
  background-color: #F09A9D;    /* Red */
}
.content {
  height: 500px;
  background-color: #F5CF8E;    /* Yellow */
}
.footer {
  height: 200px;
  background-color: #D6E9FE;    /* Light blue */
}
```

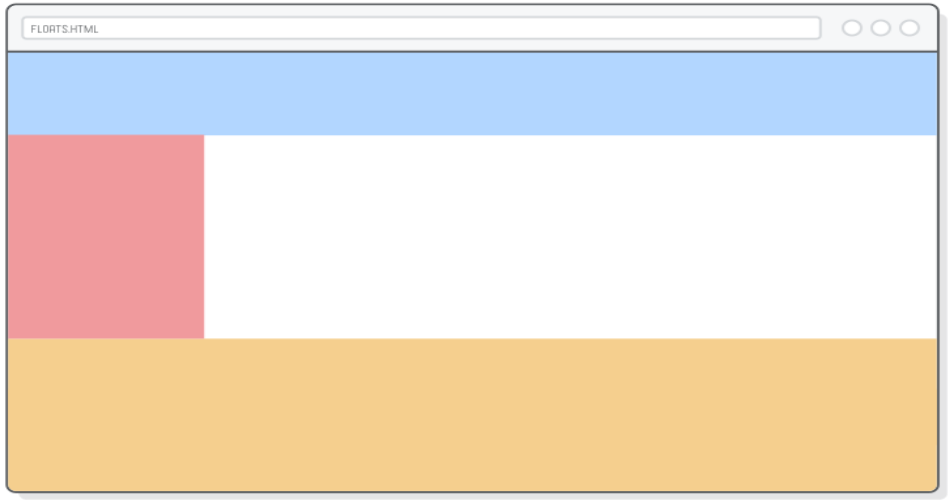
In CSS, the **asterisk** * is known as the universal selector. It is used to apply styles globally to all HTML elements on the page.

CSS – Floating boxes

How to float information

```css
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
.header {
  height: 100px;
  background-color: #B2D6FF;    /* Medium blue */
}
.menu {
  width: 200px;
  height: 300px;
  background-color: #F09A9D;    /* Red */
}
.content {
  height: 500px;
  background-color: #F5CF8E;    /* Yellow */
}
.footer {
  height: 200px;
  background-color: #D6E9FE;    /* Light blue */
}
```

We can modify the position and size of a block element by adjusting properties such as position, width, and height.



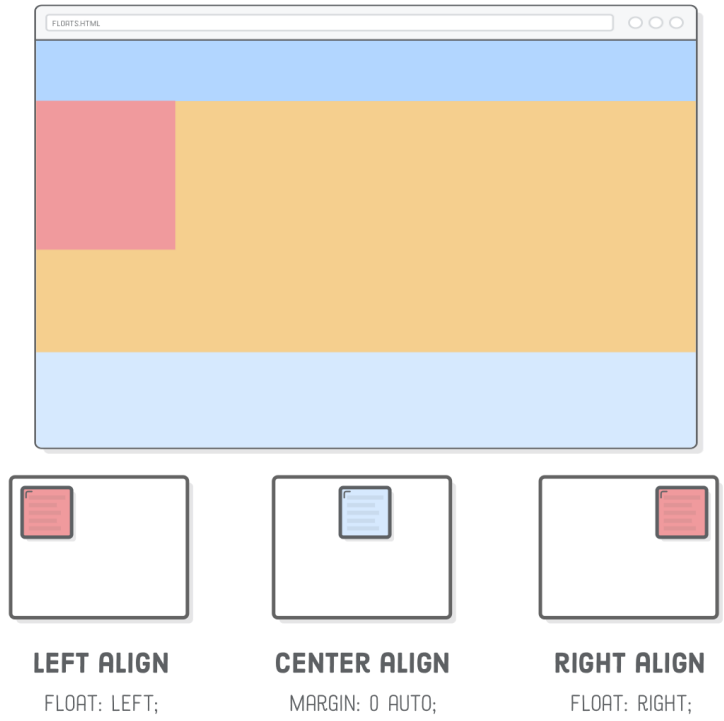
The menu element is being resized, but the other elements on the page remain unaffected, staying in their original positions.

CSS – Floating boxes

How to float information

```css
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
.header {
  height: 100px;
  background-color: #B2D6FF;    /* Medium blue */
}
.menu {
  float: left;
  width: 200px;
  height: 300px;
  background-color: #F09A9D;    /* Red */
}
.content {
  height: 500px;
  background-color: #F5CF8E;    /* Yellow */
}
.footer {
  height: 200px;
  background-color: #D6E9FE;    /* Light blue */
}
```

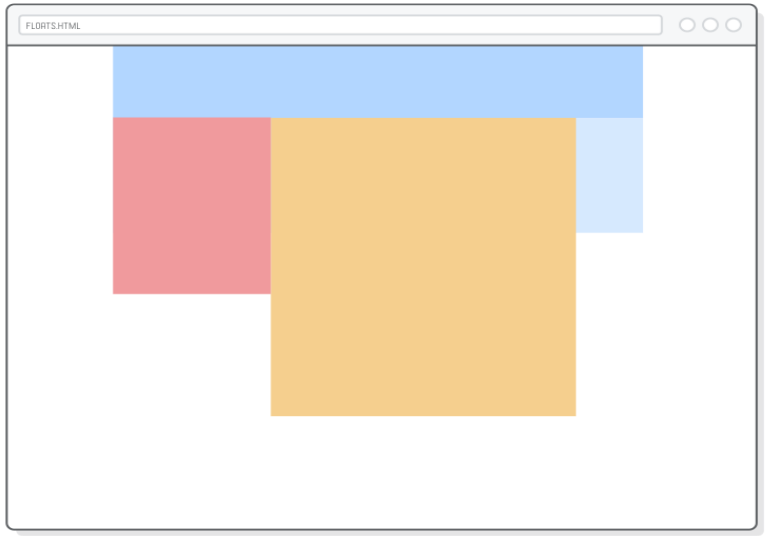
The CSS float property allows us to control the positioning of a block-level element. By **floating** an element to the left, we can align it to the left side of the page, while allowing other content to wrap around it on the right.

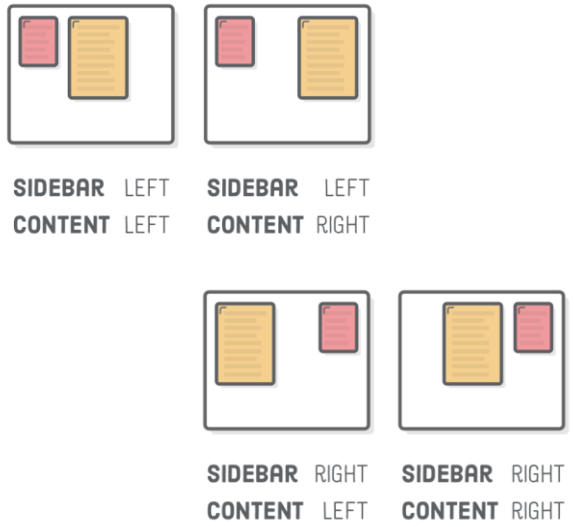


How to float information

```css
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
.page {
  width: 900px;
  margin: 0 auto;
}
.header {
  height: 100px;
  background-color: #B2D6FF;    /* Medium blue */
}
.menu {
  float: left;
  width: 200px;
  height: 300px;
  background-color: #F09A9D;    /* Red */
}
.content {
  float: left;
  width: 650px;
  height: 500px;
  background-color: #F5CF8E;    /* Yellow */
}
.footer {
  height: 200px;
  background-color: #D6E9FE;    /* Light blue */
}
```

If we float multiple elements in the same direction, they will align themselves horizontally, stacking side by side. This behaviour occurs because each floated element moves out of the normal document flow and aligns next to the previously floated element, creating a row of elements.

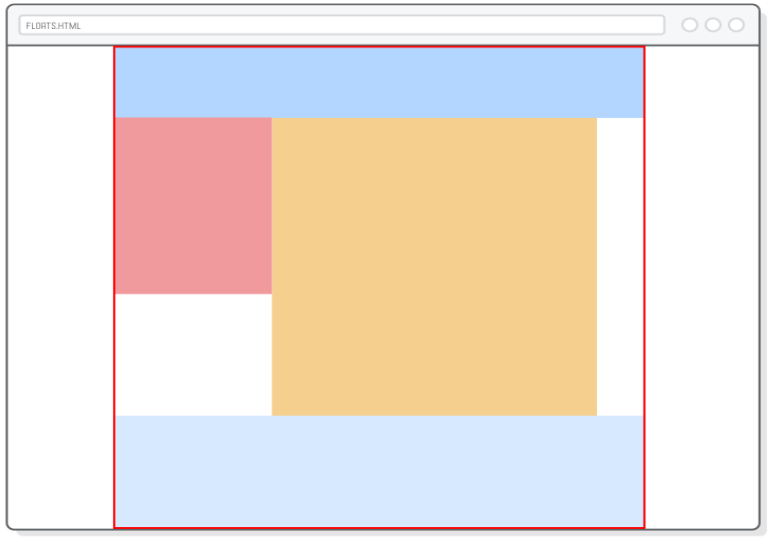


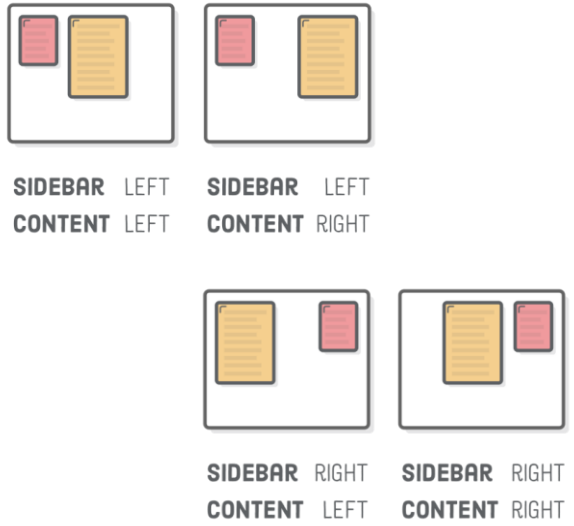


How to float information

```css
* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}
.page {
  width: 900px;
  margin: 0 auto;
}
.header {
  height: 100px;
  background-color: #B2D6FF;    /* Medium blue */
}
.menu {
  float: left;
  width: 200px;
  height: 300px;
  background-color: #F09A9D;    /* Red */
}
.content {
  float: left;
  width: 650px;
  height: 500px;
  background-color: #F5CF8E;    /* Yellow */
}
.footer {
  clear: both;
  height: 200px;
  background-color: #D6E9FE;    /* Light blue */
}
```

If we float multiple elements in the same direction, they will align themselves horizontally, stacking side by side. This behaviour occurs because each floated element moves out of the normal document flow and aligns next to the previously floated element, creating a row of elements.





CSS – Menus

05

CSS – Menus

A menu, or navigation menu, is an organized list of links that direct users to different web pages, typically within the same website. These links are usually internal, guiding users to important sections or pages of the site.

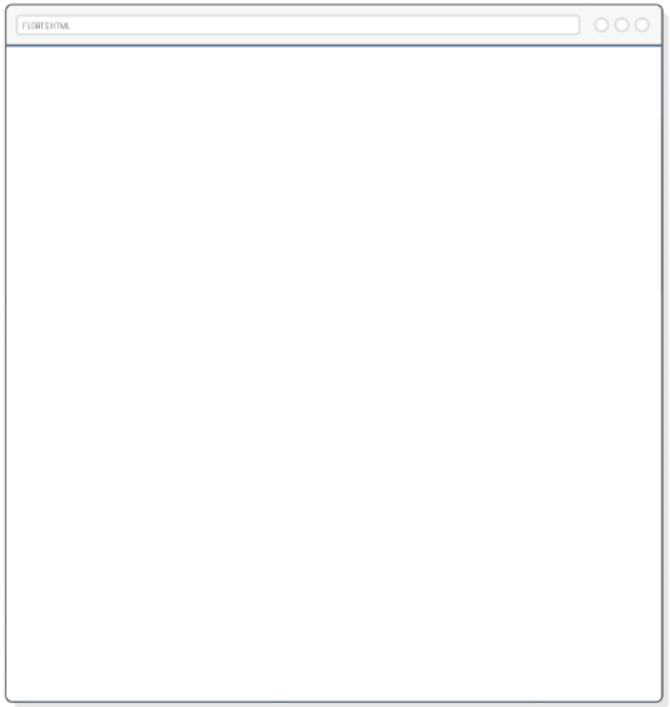
Vertical flow

Horizontal flow

- Navigation menus are often placed at the top of the page in the header, making them easily accessible and visible to users as soon as they enter the site.
- Navigation menus can also be located in sidebars, providing a convenient way to navigate through the site while keeping the main content area uncluttered.

How to add add a left side menu

```html
<!DOCTYPE html>
<html lang='en'>
<html>
<head>
    <meta charset="UTF-8">
    <title>Example side menu</title>
    <link rel='stylesheet' href='styles.css'/>
</head>
<body>
    <div class = "page">
       <div class="menu">
           <div class="sidebar"></div>
       </div>
    </div>
</body>
</html>
```

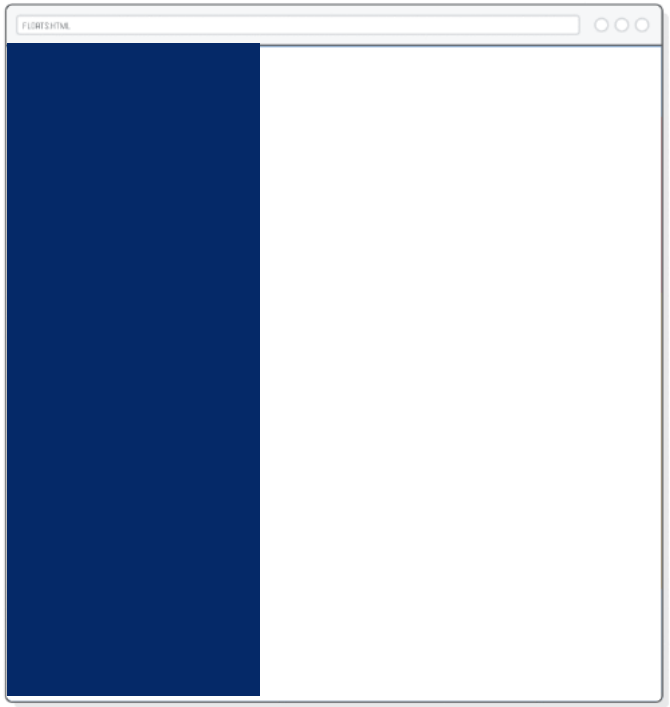


CSS – Floating boxes

How to add add a left side menu

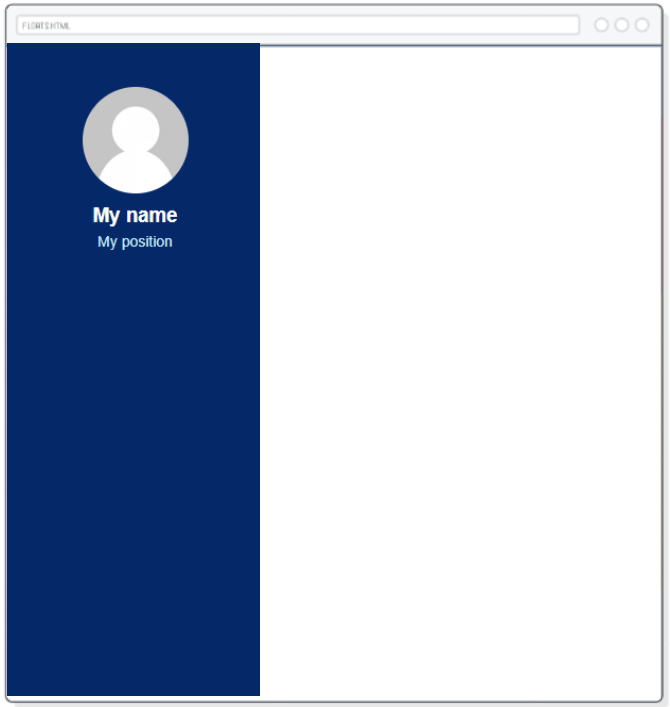
```html
<!DOCTYPE html>
<html lang='en'>
<html>
<head
    <meta charset="UTF-8">
    <title>Example side menu</title>
    <link rel='stylesheet' href='styles.css'/>
</head>
<body>
    <div class = "page">
       <div class="menu">
          <div class="sidebar">
              <div class="profile">
                 <img src="https://riverlegacy.org/wp-content/uploads/2021/07/blank-profile-photo.jpeg" alt="profile_picture">
                  <h3>My name</h3>
                  <p>My position</p>
               </div>
           </div>
       </div>
    </div>
</div>
</body>
</html>
```

We insert a new box inside the sidebar for including information about u.



How to add add a left side menu

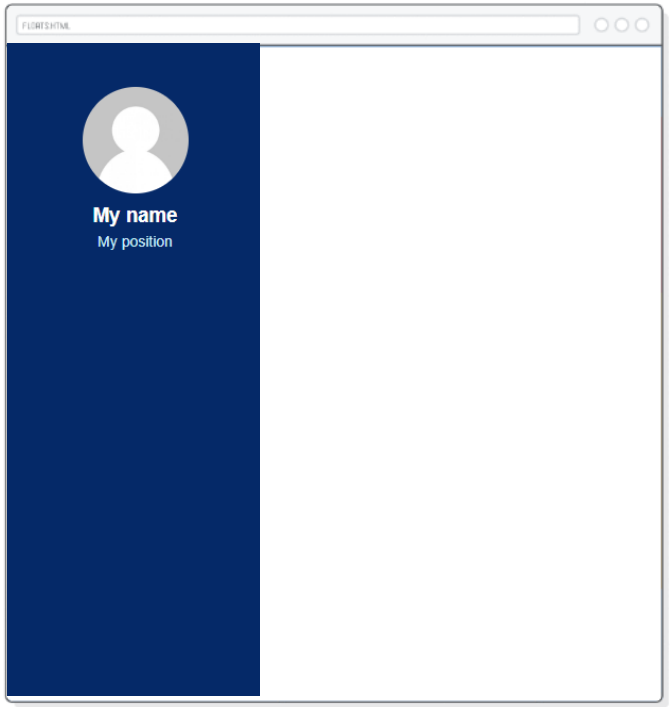
```css
.menu .sidebar .profile{
    margin-bottom: 30px;
    text-align: center;
}
.menu .sidebar .profile img{
    display: block;
    width: 100px;
    height: 100px;
    border-radius: 50%;
    margin: 0 auto;
}
.menu .sidebar .profile h3{
    color: #ffffff;
    margin: 10px 0 5px;
}

.menu .sidebar .profile p{
    color: rgb(206, 240, 253);
    font-size: 14px;
}
```



CSS – Floating boxes

How to add add a left side menu

```html
<div>
    <ul>
        <li>
            <a href="#">
                <span class="icon"><i class="fas fa-home"></i></span>
                <span class="item">Home</span>
            </a>
        </li>
        <li>
            <a href="#">
                <span class="icon"><i class="fas fa-user-friends"></i></span>
                <span class="item">Network</span>
            </a>
        </li>
        <li>
            <a href="#">
                <span class="icon"><i class="fas fa-user-shield"></i></span>
                <span class="item">Admin</span>
            </a>
        </li>
        <li>
            <a href="#">
                <span class="icon"><i class="fas fa-cog"></i></span>
                <span class="item">Settings</span>
            </a>
        </li>
    </ul>
</div>
```



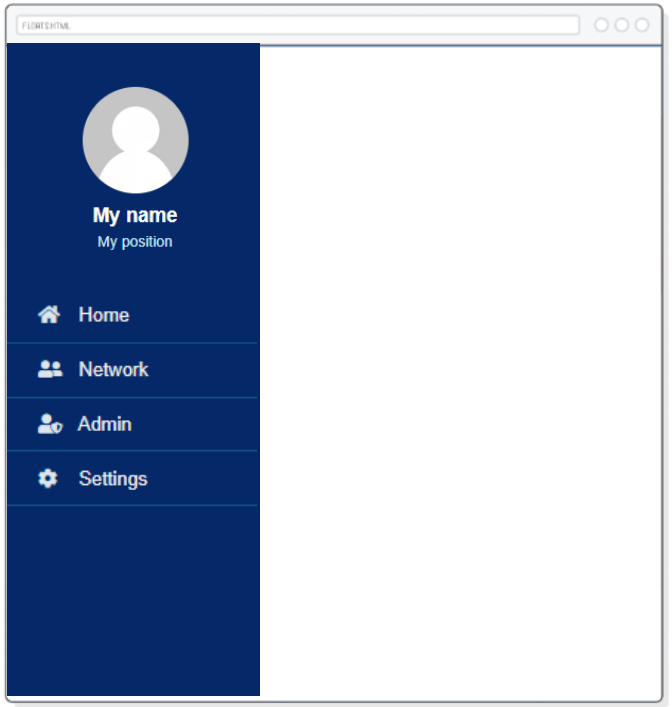
CSS – Floating boxes

How to add add a left side menu

```css
.menu .sidebar ul li a{
    display: block;
    padding: 13px 30px;
    border-bottom: 1px solid #10558d;
    color: rgb(241, 237, 237);
    font-size: 16px;
    position: relative;
}
.menu .sidebar ul li a .icon{
    color: #dee4ec;
    width: 30px;
    display: inline-block;
}
```

To include nice icons in our website, we can link to an external stylesheet that provides a library of icons.

```html
<link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.8.1/css/all.css">
```



CSS – Events

06

CSS – Floating boxes

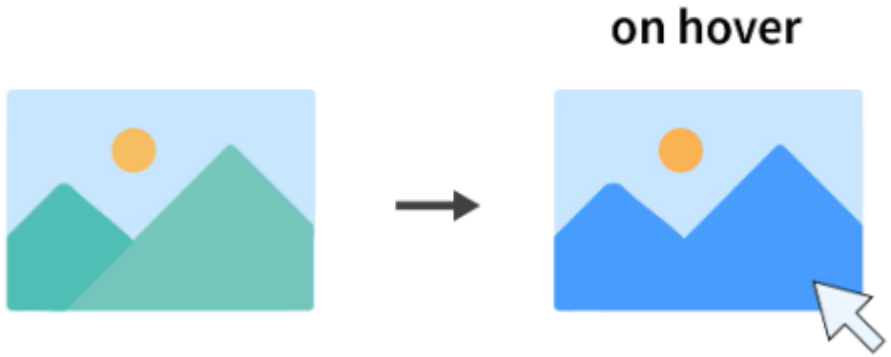
HTML, combined with CSS and JavaScript, allows us to trigger actions in a browser in response to various events, such as user interactions with elements on a webpage.

- On Hover (:hover)
- On Focus (:focus)
- On Click (onclick)

These events can be used to start a JavaScript function, modify styles, or perform other actions when the user interacts with an element.

On hover event

The :hover pseudo-class is used to apply styles to elements when the mouse pointer is placed over them allowing us to change the appearance of elements, creating interactive and dynamic effects when a user hovers over an element.

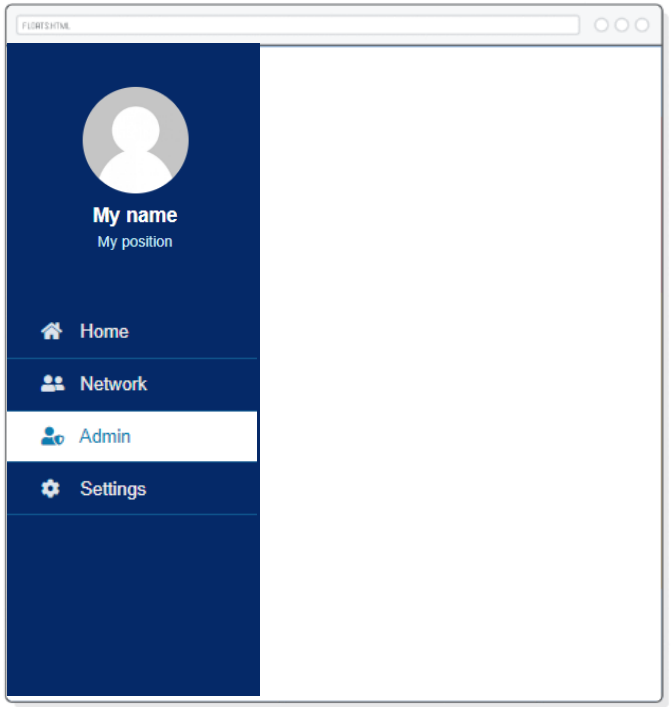


The :hover pseudo-class can be used to apply styles to any HTML element when the user hovers over it with their mouse.

On hover event

```css
.menu .sidebar ul li a:hover,
.menu .sidebar ul li a.active{
    color: #0c7db1;
    background:white;
    border-right: 2px solid rgb(5, 41, 104);
}

.menu .sidebar ul li a:hover .icon,
.menu .sidebar ul li a.active .icon{
    color: #0c7db1;
}

.menu .sidebar ul li a:hover:before,
.menu .sidebar ul li a.active:before{
    display: block;
}
```

The :hover pseudo-class is activated when the mouse pointer is placed over an element, making the element to change its appearance based on the styles defined for :hover.



CSS and more …

References

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- https://htmlcheatsheet.com/css
- https://jigsaw.w3.org/css-validator
- https://divtable.com
- https://rgbcolorcode.com
- https://badhtml.com/bad-css-practices-to-avoid