CSS

CSS is a language for specifying how documents are presented to users — how they are styled, laid out, etc.

Web browsers apply CSS rules to a document to affect how they are displayed.

Applying CSS

- A set of properties - set the element's width to be 50% of its parent element, and its background to be red.
- Rule = selector, property and value
- A selector - apply the CSS rule to all the paragraphs in the HTML document, may include a combination of different qualifiers.

Applying CSS to HTML

1) External stylesheet

```
<link rel="stylesheet" href="style.css">
```

2) Internal stylesheet

```
<style>
   h1 {
      color: blue;
   }
</style>
```

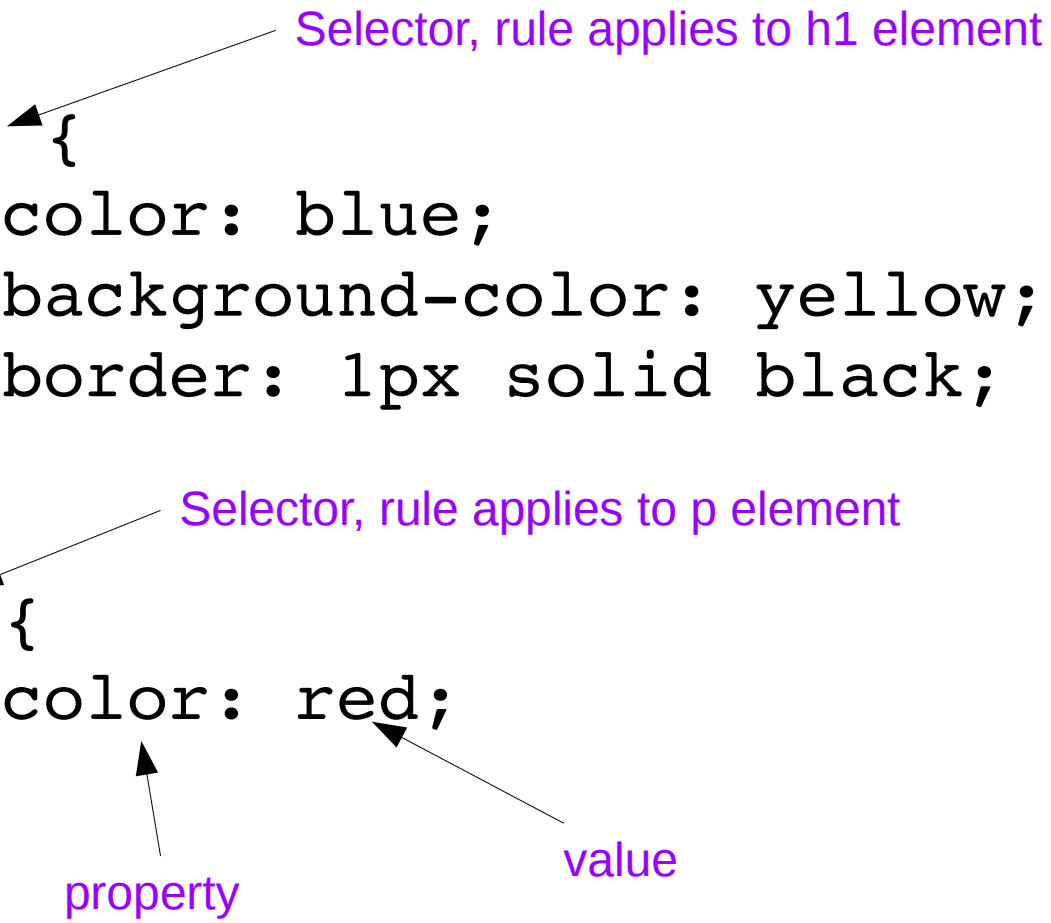
3) Inline styles

don't use this method unless you have no choice

```
<p style="color:red;">text</p>
```

CSS example

```
<link rel="stylesheet" href="style.css">
```

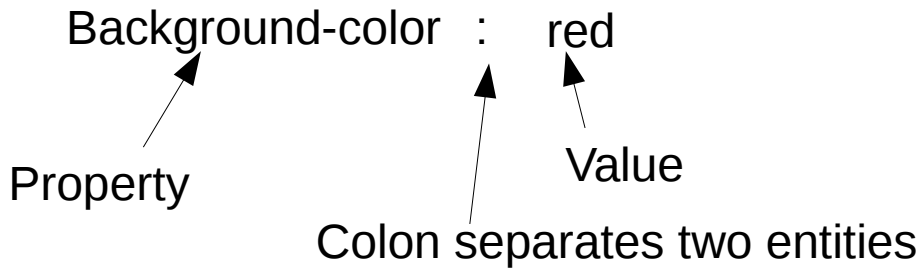


CSS declarations

- A property paired with a value is called a CSS declaration.
- CSS declarations are put within CSS Declaration Blocks.
- And finally, CSS declaration blocks are paired with selectors to produce CSS Rulesets (or CSS Rules).

CSS Declarations

A CSS declaration



There are more than 300 different properties in CSS and nearly an infinite number of different values.

In CSS (and other web standards), US spelling has been agreed on

If a property is unknown or if a value is not valid for a given property, the declaration is deemed invalid and is wholly ignored by the browser's CSS engine.

Selectors

- Determines which element or elements within our HTML to target
- Selectors may include a combination of different qualifiers, depending how specific we want to be
- type, class, and ID selectors

Type selectors

- target elements by their element type

  in css file:

  ```
  p {
      ……
  }
  ```

  in html file:

  ```
  <p> ….. </p>
  ```

Class selectors

- select an element based on the element’s class attribute value
- more specific than type selectors, as they select a particular group of elements rather than all elements of one type

  in CSS file (period plus class attribute value)

  ```
  .nice {
  }
  ```

  in HTML file

  ... (also <h1 class=”nice”>)

ID selectors

- even more precise than class selectors, as they target only one unique element at a time
- use an element’s id attribute value as a selector
- id attribute values can only be used once per page (hash sign plus the id attribute value)

  in css file: #unique { ... }

  in html: ...

Exerecise

Open your first html page and apply styles to all elements.

Tip save styles in style.css. Don’t forget to add:

```
<link rel="stylesheet" href="style.css">
```

style.css

```
h1 {
}
p {
}
li {
}
```

How does CSS actually work?

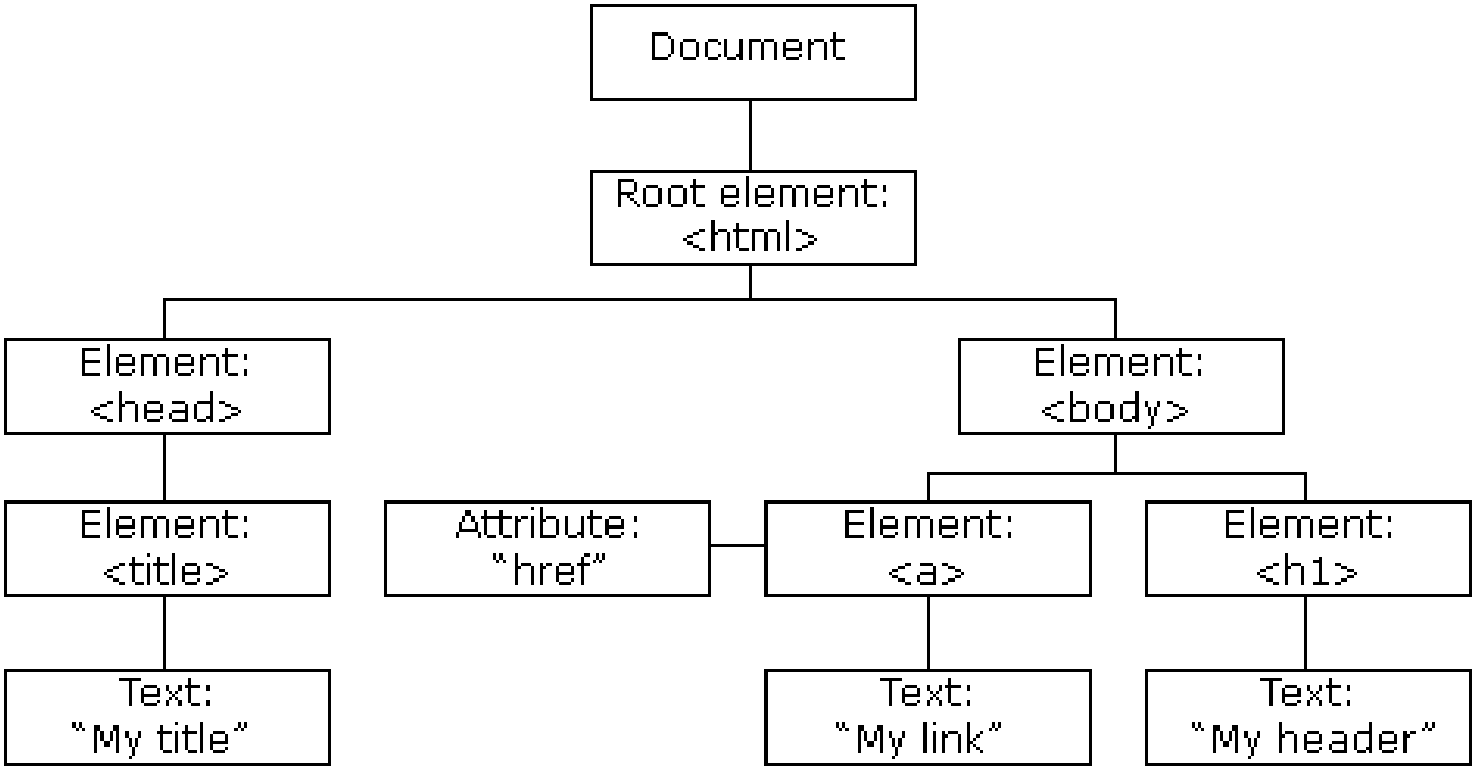
1. The browser converts HTML and CSS into the DOM (Document Object Model). The DOM represents the document in the computer's memory. It combines the document's content with its style.

2. The browser displays the contents of the DOM.

DOM

A DOM has a tree-like structure. Each element, attribute and piece of text in the markup language becomes a DOM node in the tree structure. The nodes are defined by their relationship to other DOM nodes. Some elements are parents of child nodes, and child nodes have siblings.

DOM tree


Document
Root element:
<html>
Element:
<head>
Element:
<body>
Element:
<title>
Attribute:
"href"
Element:
<a>
Element:
<h1>
Text:
"My title"
Text:
"My link"
Text:
"My header"

Additional selectors

- Selectors are extremely powerful and the ones we have covered so far are the most common. But there are many more advanced selectors.
- Child Selectors
- Sibling Selectors
- Attribute Selectors
- Pseudo-classes

Child Selectors

Child Selectors

CSS: article h2 {…}

HTML:

```
<h2>This heading will NOT be selected</h2>
<article>
  <h2>This heading will be selected</h2>
  <div>
    <h2>This heading will be selected</h2>
  </div>
</article>
```

Sibling Selectors

CSS:

h2 ~ p {...}

HTML:

This paragraph will not be selected

<section>

```
<h2>heading 2</h2>

<p>This paragraph will be selected</p>
```

</section>

Attribute Selector

In CSS:

```
a[target] {...}
```

In HTML:

```
<a href="#" target="_blank">...</a>
```

Pseudo-classes

- The most common pseudo-class, and one you've likely seen before, is :hover
- Like regular HTML classes, but not explicitly stated in the markup.
- They are dynamically populated as result of user actions or the document structure

  a:link {...}

  a:visited {...}

  li:first-child, :last-child

CSS Resets

- Each web browser has its own default styles for different elements
- CSS resets are used to ensure cross-browser compatibility
- Resets generally involve removing any sizing, margins, paddings, or additional styles
- Reset needs to be at the very top of the style sheet
- Eric Meyer’s reset
- Normalize.css

How styles are rendered

The Cascade

from the top of a style sheet to the bottom, allowing different styles to be added or overwritten as the style sheet progresses

Example:

```
p {
  background: red;
  font-size: 28px;
}
p {
  background: green;
}
```

–

Cascading Properties

The cascade also works with properties inside individual selectors

```
p {
  background: red;
  background: green;
}
```

However, when different types of selectors are used, the specificity of those selectors can break the cascade

Specificity

Each selector in CSS has a specificity weight.

A selector’s specificity weight and its placement in the cascade, determines how it will be styled.

type, class, and ID selectors

- The type selector has the lowest specificity weight and holds a point value of 0-0-1
- The class selector has a medium specificity weight and holds a point value of 0-1-0
- Lastly, the ID selector has a high specificity weight and holds a point value of 1-0-0

IMPORTANT !

ID selector has a higher specificity weight than the class selector, and the class selector has a higher specificity weight than the type selector

Combining Selectors

By combining selectors we can be more specific about which element or group of elements we'd like to target.

When selectors are combined they should be read from right to left. The selector farthest to the right, directly before the opening curly bracket, is known as the key selector. The key selector identifies exactly which element the styles will be applied to. Any selector to the left of the key selector will serve as a prequalifier. (eg. .rainbow p.first)

Specificity Within Combined Selectors

When selectors are combined, so are the specificity weights of the individual selectors.

- the first selector, .rainbow p, has both a class selector and a type selector therefore combined value is 0-1-1
- the second selector, .rainbow p.first, had two class selectors and one type selector. Combined, the selector has a specificity point value of 0-2-1.
- the second selector, with its two classes, has a noticeably higher specificity weight and point value and will take precedence within the cascade.

Multiple classes

Elements within HTML can have more than one class attribute value so long as each value is space separated.

HTML:

```
<a class="button failure">...</a>
<a class="button success">...</a>
```

CSS:

```
.button {
  font-size: 16px;
}
.failure {
  background: red;
}
.success {
  background: green;
}
```

Exercises

- Built HTML page with html tags styled with just type, class selectors, id selectors and combined selectors: child, sibling, attribute, pseudoclass.
- Write CSS file, which would apply style to these html elements

Sources

https://developer.mozilla.org/en-US/docs/Learn/CSS/Introduction_to_CSS/Syntax

https://www.w3schools.com/js/js_htmldom.asp

https://learn.shayhowe.com/html-css/

Examples:

https://codepen.io/AgataDCI/pen/yKQPJK?editors=1100