Cascading Style Sheets

* A stylesheet language that is used to describe the appearance of a document in terms of how the HTML elements are presented
* One of core languages of open web
* Standardized according to W3C Specification.
* Mainly developed to resolve fonts and colors included in large websites causing it to have a long process.

Developers had many ideas regarding how the elements could be presented out in the web. Although it was not part of Berners-Lee’s motivation, there were few languages for web page layout.

Web Page Layout

1. ViolaWWW Browser
   * It was created by Take Pei-Yuan Wei in 1991
   * It was a stylesheet incorporated into his own browser
   * It has the basic navigation features such as bookmark list, and history list that allows one to traverse the documents automatically.
   * It is an extensible World Wide Web hypermedia browser that supports interactive objects and features like stylesheets and tables.
   * It did not succeed to be a standard, but it was one of the style sheet inspiration for today’s specifications.

1. Netscape navigator
   * It was developed by Marc Andreessen on October 13th 1994
   * It was extended HTML language which includes presentational and unstandardized HTML.
2. Cascading HTML Style Sheets
   * It was proposed by Hakon W Lie in October 1994
   * It supported multiple stylesheet viewing to maintain personal-freedom of the web.
   * It was further simplified and was published as CSS spec in December of 1996

Cascading Style Sheets has different levels which shows their standards refined as it levels up. There were also features added in newer levels as a superset of the lower ones.

CSS Levels

CSS Level 1

CSS I specification is considered obsolete by the CSS Working Group as it was the first specification established. It was describes as a simple style sheet mechanism which allows the users to include styles like colors and fonts to HTML documents. Multiple stylesheets from different users is supported to cater their needs and preferences.

There were basic concepts included in this level of recommendation such as the containment in HTML defining how HTML and style sheets can be linked. Grouping was also included to reduce the style sheet’s size. It is used to group selectors having the same declarations. To have the same function with the parent element, inheritance can be used. In this case, any element that did not have any assigned style will inherit the style of its parents. In this level, selectors can either be a class, an ID or a context. Lastly, comments were included for the developers’ use and it formatted similarly to C programming language.

Pseudo-classes and pseudo-elements in CSS1 extend addressing to allow eternal information take effect with the formatting process. They are inserted in certain condition for addressing in style sheets. There were different pseudo-classes and elements such as Anchor pseudo-classes, Typographical pseudo-elements, the 'first-line' pseudo-element, the 'first-letter' pseudo-element, Pseudo-elements in selectors, and Multiple pseudo-elements. It was indicated in CSS1 that multiple style sheet can take action with the presentation simultaneously for modularity and author/reader balance.

The CSS1 supposes that each formatted element results in rectangular boxes. Elements can either be formatted as block-level or inline. Different style properties can have any value assignment. These style properties are font, color, text, box, and classification properties.

CSS level 2

CSS level 2 had several problems detected though it already passed the recommendation stage. CSS level 2.1 was then specified. The problems were addressed by maintaining the compatibility with the widely accepted CSS2 and removing CSS2 features that were rejected by the CSS community. Conventions were added such as conventions of document language elements and attributes where it is stated that CSS values should be delimited by single quotes while language attributes should be delimited by double quotes. Property definitions contains key information including value, initial, applies to, inherited, percentage values, media groups and computed value. A property can also be specified as a shorthand property which means that authors can specify the values of properties with a single property.

CSS level 3

Module by module, CSS 3 forms on CSS level 2 and adds functionalities to CSS 2.1. It was in the level 3 when selectors were defined furthermore. These selectors represent structure which can be used as a condition. Selector syntax is also case sensitive within the ASCII range depending on the document language. A selector is a chain of simple selector/s that are delimited by combinators which begins with a type selector or universal selector. This simple selector is either a universal selector, type selector, attribute selector, class selector, ID selector, or pseudo-class. Additionally, a list of selectors delimited by comma represent the combination of elements selected by each selector.

Psuedo elements allow authors to refer to content that does not exist in the document or inaccessible information. It was specified to be made of two colons (::) followed by the pseudo-element name. Examples of pseudo-elements stated were ::first-line pseudo-element; ::first-letter pseudo-element; ::before, and :: after pseudo-elements.

The combinators can be identified as either a descendant combinator, child combinatory or a sibling combinator. Descendant combinators convey a relationship of an element inside another element and is a whitespace separating two simple selectors. Child combinator on the other hand expresses a childhood relationship between elements and utilizes greater-than sign. Lastly, the sibling combinators separate simple selectors depending on their type of relationship they have. If the sibling combinator is a next-sibling combinatory, it makes use of a plus sign. While if it is a subsequent-sibling combinator, it uses tilde (~). Both elements’ with sibling-combinator share the same parent in the document tree. The difference is that the next-sibling combinatory is used when the first element directly precedes by the second one, while the subsequent-sibling combinator is used when the first element does not necessarily heads the second directly.

The specificity is the process of which the browsers decide what CSS property values are the most important to a specific element, and consequently will be operated. A selector’s specificity can be calculated according to the following CSS3 recommendation:

* the count of ID selectors in the selector
* the count of class selectors, attributes selectors, and pseudo-classes in the selector
* the count of type selectors and pseudo-elements in the selector
* ignore the number of universal selector

CSS level 4

Extending the level 3, level 4 entitled Selectors Level 4 have been improved and designed to be usable in accordance to performance-critical code. Aside from simple selector, it has now a type of selector which is called compound selector. This selector is not separated by a combinator and represents a set of conditions on a single element. A complex selector on the other hand is a sequence of compound selector/s separated by combinator.

Document Object Model, also known as DOM, is used for evaluating selectors which can result into document tree or source document. Selectors such as scoped selector and relative selector are included in level 4. Scoped selectors pertain to those selectors that matches an element if it is a descendant of the scoping root. While the relative selectors are shorthand for selectors that represent elements related to a scope element.

Namespace prefixes are supported by selectors in this level. These namespace prefixes are declared with the ‘@namespace’ rule as indicated. Error handling is already observed in this level as well and must be observed by the user agents.

Logical combinations such as Selector Lists, matches-any pseudo-class, negation pseudo-class, specificity-adjustment pseudo-class and relational pseudo-class are also observed. These specifies the validity of selector groupings and conditions. While the elemental selector type selector symbolizes an instance of a certain element type in the document tree. Under this selector is the universal selector which symbolizes an element of any type of element. As indicated, attribute selectors match elements depending on the value of a given attribute.

Pseudo classes :dir() and :lang() are defined in this level as the pseudo-classes that allows the user to represent an element depending on the document language and its direction. The location of an element could be accessed through these location pseudo-classes that are Hyperlink Pseudo-class :any-link; Link History Pseudo-classes :link and :visited; Local Link Pseudo-class::local-link; Target Pseudo-class :target; Target Container Pseudo-class :target-within; and Reference Element Pseudo-class :scope.

User action Psuedo classes were also defined as the pseudo-classes utilized for the unteraction of the users with the document. These are the Pointer Hover Pseudo-class :hover; Activation Pseudo-class :active; Input Focus Pseudo-class :focus; Focus-Indicated Pseudo-class :focus-visible; Focus Container Pseudo-class :focus-within; and Drop Target Pseudo-class :drop and :drop().

For time-dimensional Pseudo-classes, there are three classifications that describes the elements’ state in a timeline. The Current-element Pseudo-class, Past-element Pseudo-class and Future-element Pseudo-class are the three classifications that was described earlier. Input Pseudo-classes are also included such as the input control states, input value states and input value-checking that are mainly used for the users’ input.

Lastly, the tree-structural pseudo-classes is used to select based on the information in the document tree which cannot be represented by a combinatory or a simple selector. Some of these are the :root pseudo-class, :empty pseudo-class and :blank pseudo-class. It can be also identified either a child-indexed pseudo-class or a typed child-indexed pseudo classes. In child-indexed pseudo-classes, select elements depending on their index amongst their siblings. These are as follows: :nth-child() pseudo-class; :nth-last-child() pseudo-class; :first-child pseudo-class; :last-child pseudo-class; :only-child pseudo-class. On the other hand, the typed child-indexed pseudo-classes depends on the element’s index among elements of the same type. The typed child-indexed pseudo-classes are: :nth-of-type() pseudo-class; :nth-last-of-type() pseudo-class; :first-of-type pseudo-class; :last-of-type pseudo-class; :only-of-type pseudo-class.

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