Pseudo-class

A pseudo-class in CSS is used to define a special state of an element. It lets you style elements based on user interaction or their position in the document. For example, `a:hover` changes the style of a link when you move your mouse over it, and `input:focus` changes the style when a user clicks inside an input box.

Example:

a:hover { color: red; }
input:focus { border: 2px solid blue; }

Pseudo-element

A pseudo-element allows you to style specific parts of an element, not the entire element. It is often used to add extra styling or text without modifying the HTML. For example, you can style the first letter or first line of a paragraph, or add decorative content before or after an element.

Example:

p::first-letter { font-size: 30px; color: blue; }
h1::before { content: '★ '; color: gold; }

Difference Between Pseudo-class and Pseudo-element

A pseudo-class defines the state of an element, like when a user hovers or focuses on it. A pseudo-element defines a part of an element, like its first letter or line, or adds generated content. Pseudo-classes use a single colon (:), while pseudo-elements use a double colon (::). Example — `a:hover` (pseudo-class) changes link color on hover, while `p::first-letter` (pseudo-element) styles only the first letter of a paragraph.

CSS Position Property

The position property controls how elements are placed on a web page. Static is the default position where the element stays in normal flow. Relative positions an element relative to its normal position. Absolute positions it relative to its nearest positioned ancestor. Fixed positions it relative to the viewport so it stays in place when scrolling. Sticky acts like relative until you scroll to a certain point, then it sticks.

Example:

.box { position: absolute; top: 50px; left: 100px; }

Z-index

The z-index property decides which element appears on top when elements overlap. A higher z-index value means the element will appear above others with lower values. It only works on elements that have a position other than static.

Example:

.box1 { position: absolute; z-index: 1; }
.box2 { position: absolute; z-index: 2; }

Where We Use These in a Webpage

Pseudo-classes are used for hover effects on buttons, links, or forms to improve user interaction. Pseudo-elements are used to decorate text, add icons, or create effects without adding extra HTML tags. Position is used to place headers, footers, tooltips, or modals exactly where you want them. Z-index is used when you want to layer elements — like showing a popup or dropdown menu above the page content.