匠人学院
JR ACADEMY

Web开发进阶班第1期

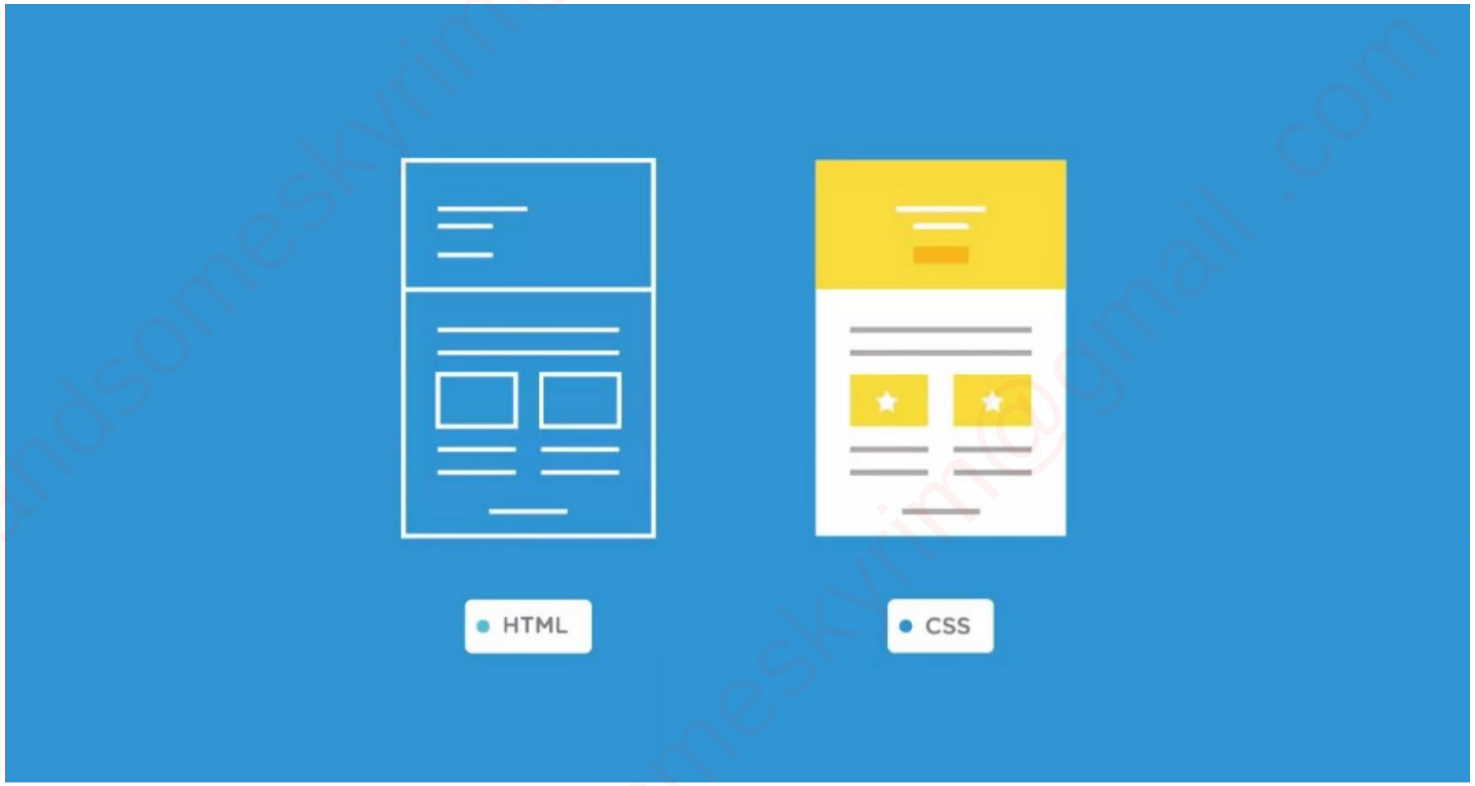
Lesson 3 CSS

2023.07.22

1. CSS介绍
2. CSS选择器用法
3. CSS Box Model

1. CSS介绍

1. Colors
2. Backgrounds
3. Font Sizes
4. Layouts
5. ……



1. CSS介绍

CSS - Cascading Style Sheets (CSS) is a style sheet language used for describing the look and formatting of a document written in a markup language.

CSS describes how HTML elements are to be displayed on screen, paper, or in other media.

CSS is not a programming language. You can't do conditional rendering with it but you can perform some math-based calculations for values and units.

CSS is used on virtually every website in existence. You don't need CSS but it helps increase the user experience ten-fold. Making a website easy to read and easy to use should be a primary goal.

1. CSS介绍

CSS1 - 1996 - Fonts, Colors, Alignment, Spacing
CSS2.1 - 2004 - Layout, positioning CSS3 - latest - Effects, sizing, speech

http://www.w3.org/Style/CSS/

1. CSS介绍

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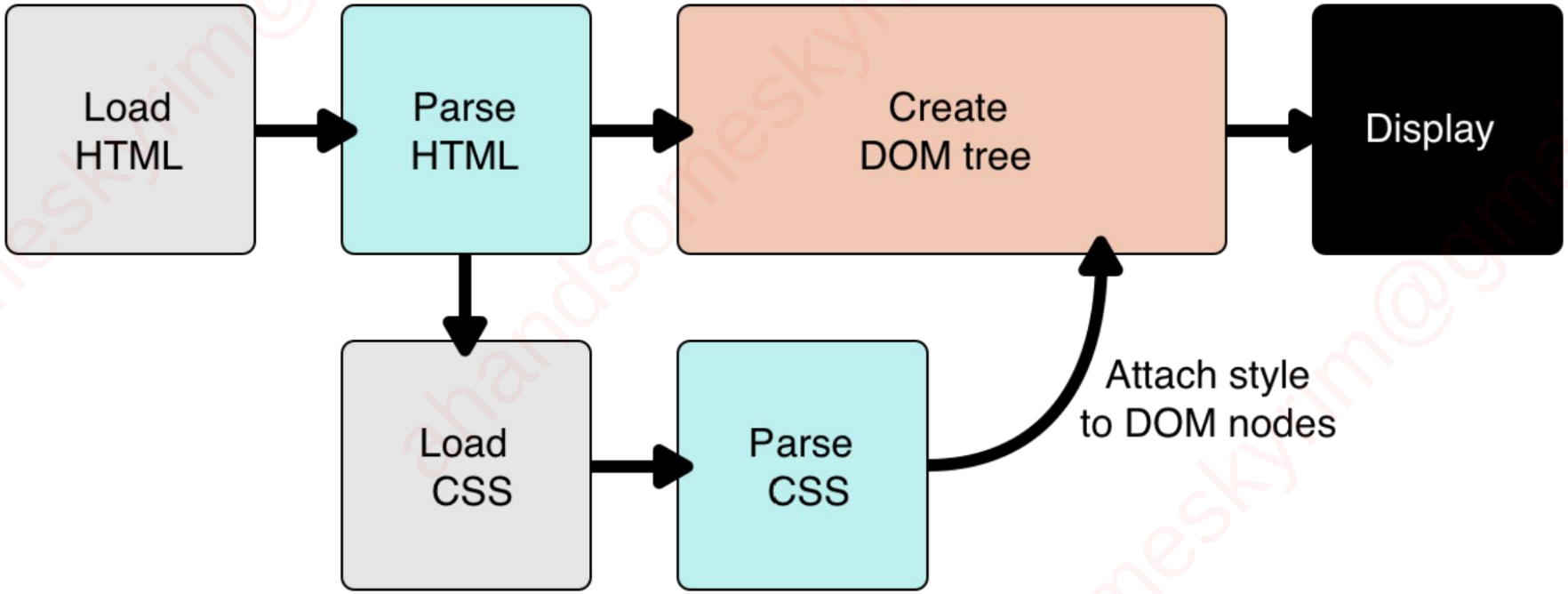
How does CSS actually work?

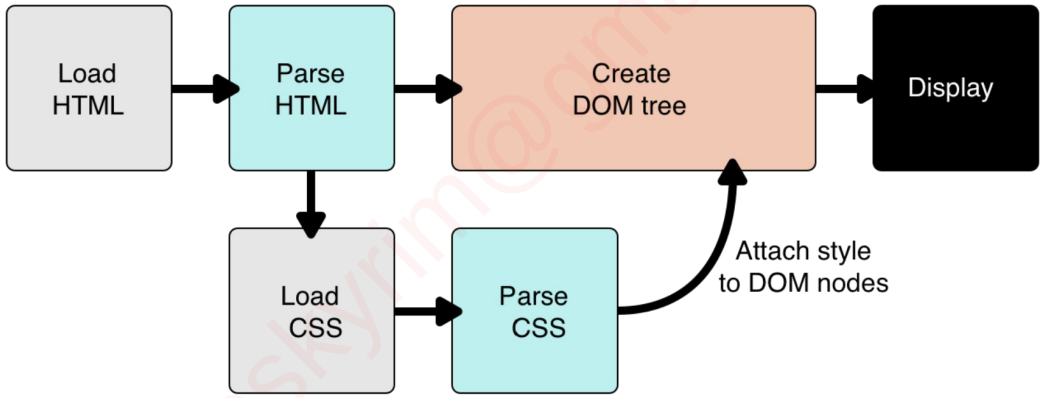


1. CSS介绍

How does CSS actually work?

DOM - Document Object Model
The DOM creates HTML document nodes of which we can style with CSS.

1. The browser loads the HTML (e.g. receives it from the network).
2. It converts the HTML into a DOM (Document Object Model). The DOM represents the document in the computer's memory.
3. The browser then fetches most of the resources that are linked to by the HTML document, such as embedded images and videos ... and linked CSS!
4. The browser parses the fetched CSS and sorts the different rules by their selector types into different "buckets", e.g. element, class, ID, and so on. Based on the selectors it finds, it works out which rules should be applied to which nodes in the DOM, and attaches style to them as required (this intermediate step is called a render tree).
5. The render tree is laid out in the structure it should appear in after the rules have been applied to it.
6. The visual display of the page is shown on the screen (this stage is called painting).



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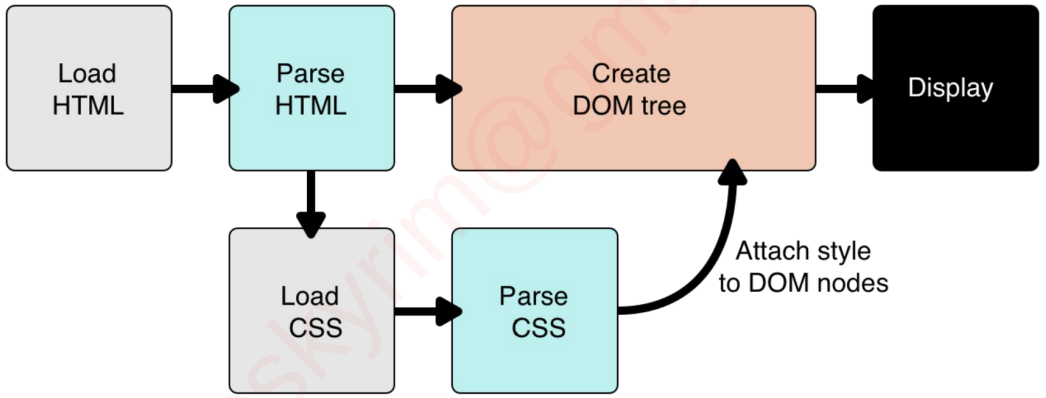
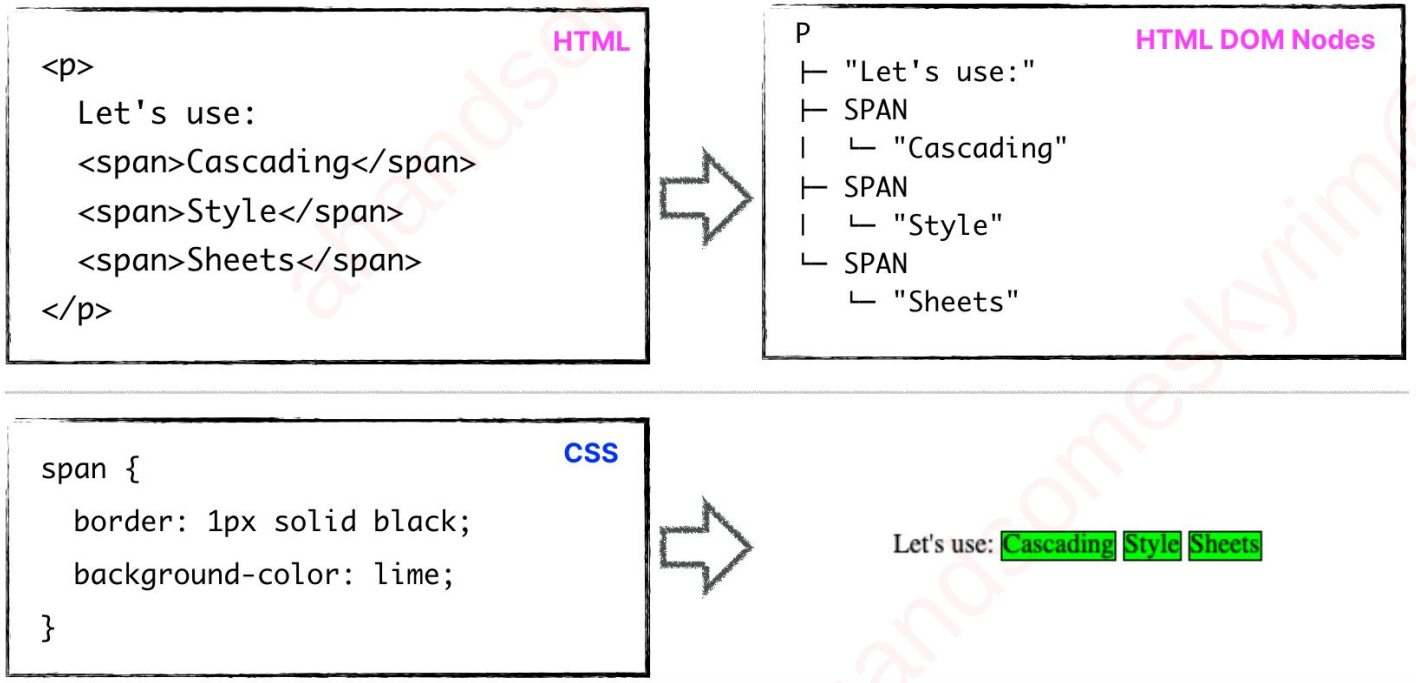


1. CSS介绍

Understanding how CSS is applied

The browser will parse the HTML and create a DOM from it, then parse the CSS. Since the only rule available in the CSS has a span selector, the browser will be able to sort the CSS quickly. That will apply that rule to each one of the three `<span>`s, then paint the final visual representation to the screen.



1. CSS介绍

Three ways to insert CSS

There are three ways you can include CSS in a web page. These are as follows:

- External Stylesheet
- Interal Stylesheet
- Inline Style

1. CSS介绍

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- External Stylesheet

```
<!DOCTYPE html>
<html>

<head>
    <link rel="stylesheet" type="text/css" href="externalstylesheet.css">
</head>

<body>
    <h2>CSS formatting rules</h2>
</body>

</html>
```

1. CSS介绍

- Internal Stylesheet (recommended)

```
<!DOCTYPE html>
<html>

<head>
    <style>
        h2 {
            font-size: 20px;
        }
    </style>
</head>

<body>
    <h2>CSS formatting rules</h2>
</body>

</html>
```

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- Inline Style

```
<!DOCTYPE html>
<html>

<head>
    <style>
        h2 {
            font-size: 20px;
        }
    </style>
</head>

<body>
    <h2 style="font-size: 30px;">CSS formatting rules</h2>
</body>

</html>
```

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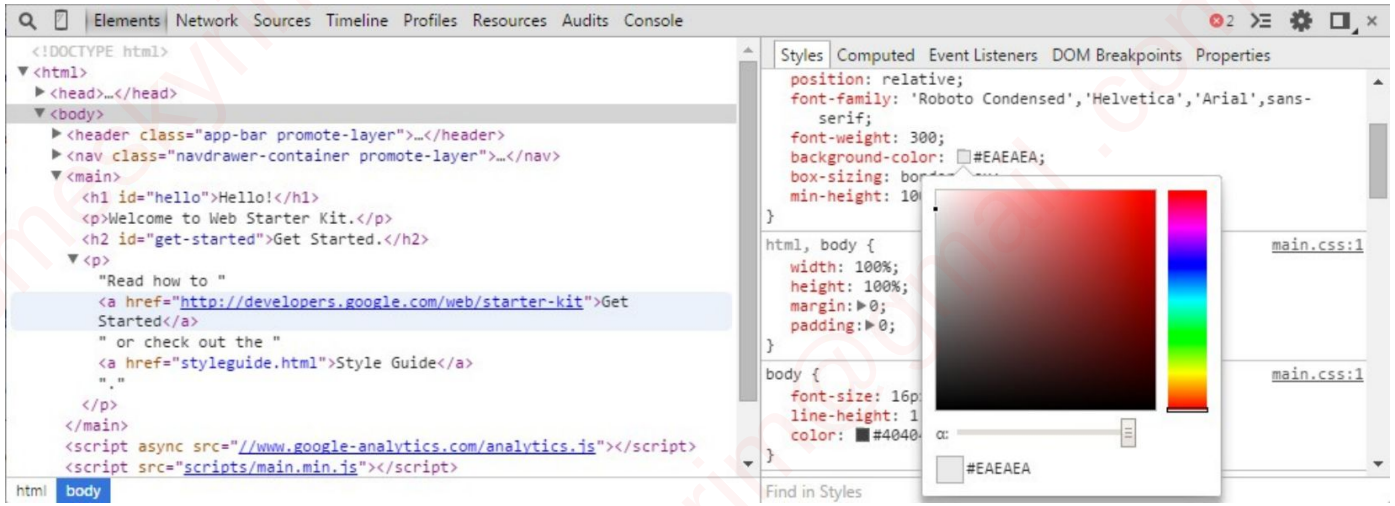
How to Access DevTools



Access Developer Tools

1. Right-click a page and select "Inspect Element". This displays the HTML code for the element you clicked.
2. Select View > Developer > Developer tools.

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How to Access DevTools

- 在 Elements 面板中检查和实时编辑 DOM 树中的任何元素。
- 在 Styles 窗格中查看和更改应用到任何选定元素的 CSS 规则。
- 在 Computed 窗格中查看和修改选定元素的框模型。

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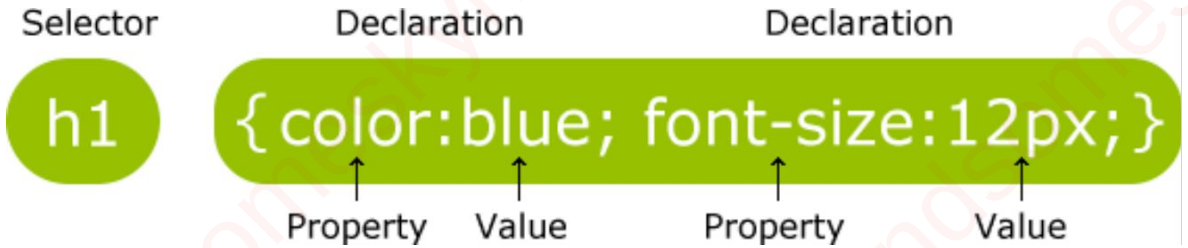
Style rules

Web 浏览器将 CSS 规则应用于文档以影响它们的显示方式。一个 CSS 规则由以下组成：

- 一个 选择器，它选择元素，这（些）元素是你想应用这些最新的属性值于其上的元素。
- 一组 属性，属性的值更新了HTML的内容的显示方式。

1. CSS介绍

Style rules




```css
h2{
    color: black;
    font-size:24px;
}
.bold {
    font-weight: bold;
}
```

Selectors

A selector is part of a CSS rule that targets what HTML element it will be applying styles to. A selector can target an element or many elements at the same time.

简单选择器(Simple selectors):通过元素类型、class 或 id 匹配一个或多个元素。

```
h1 { }, .box { }, #header { }
```

属性选择器(Attribute selectors):通过 属性 / 属性值 匹配一个或多个元素。

```
input[type="text"] { }, a[href="https://google.com"] { }
```

伪类选择器(Pseudo-classes and pseudo-elements):通过伪类或者伪元素

```
a:hover { }, p::first-line { }
```

组合选择器(Combinators):组合选择器

```
ul > li
```

Simple Selectors

Element Selector

```
body {
    background-color:#cccc99;
}
```

ID Selector

```
#menu {
    background-color:#ffff00;
}
```

Class Selector

```
.bookTitle {
    font-style:italic;
}
```

Pseudo Selectors

伪类(Pseudo-classes):匹配处于确定状态的一个或多个元素，比如被鼠标指针悬停的元素，或当前被选中或未选中的复选框，或元素是DOM树中一父节点的第一个子节点。

```
a:hover {}
a:focus {}
div:first-child {}
div:nth-child(2) {}
div:last-child {}
```

Pseudo Selectors

伪类(Pseudo-classes):匹配处于确定状态的一个或多个元素，比如被鼠标指针悬停的元素，或当前被选中或未选中的复选框，或元素是DOM树中一父节点的第一个子节点。

```
selector:pseudo-class {
    property:value;
}
```

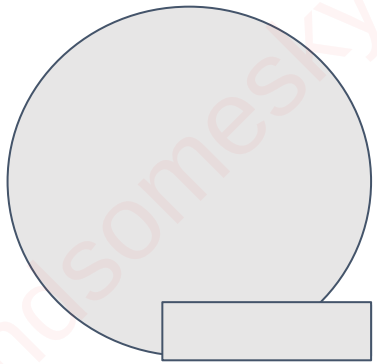
```
/* unvisited link */  a:link {
color: #FF0000;
}

/* visited link */  a:visited {
color: #00FF00;
}

/* mouse over link */  a:hover {
color: #FF00FF;
}

/* selected link */  a:active {
color: #0000FF;
}
```

Pseudo Selectors

伪元素(Pseudo-elements):匹配处于相关的确定位置的一个或多个 元素，例如每个段落的第一个字，或者某个元素之前生成的内容。

```
div::after {}
div::before {}
```

Add emoji “\01F604", "\01F620"



Combination Selectors

Descendant selector

```css
div p {
    background-color: #3a3a3a;
}
```

```html
<div>
    <form>
        <p>I'm a descendant</p>
    </form>
</div>
```

Child selector

```css
div > p {
    background-color: #3a3a3a;
}
```

```html
<div>
    <form>
        <p>I'm a descendant,
            but not a child</p>
    </form>
    <p>I'm a child</p>
</div>
```

Adjacent sibling selector (+) sibling selector(~)

Units

像素 (px) 是一种绝对单位（absolute units），因为无论其他相关的 设置怎么变化，像素指定的值是不会变化的。其他的绝对单位如下：
mm, cm, in

1 pixel (X)	**0.0264583333 cm**
2 pixel (X)	0.0529166667 cm
3 pixel (X)	0.079375 cm
5 pixel (X)	0.1322916667 cm

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Units

- Screen measurements

pixels(px)

- Relative measurements

%,em, pt

- kyleschaeffer.com/development/css-font- size-em-vs-px-vs-pt-vs/

- Color

#rrggbb , rgb(r,g,b), rgba(r,g,b,a)

- Fonts

sans-serif, google fonts(https:// fonts.google.com/)

- Functional notation

background: url(http://www.example.org/image);

Units

- vw, vh
- %
- 0
- auto

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Well used properties

- width and height (min- and max-)
- margin and padding
- font
- border
- background and color
- text-align
- display

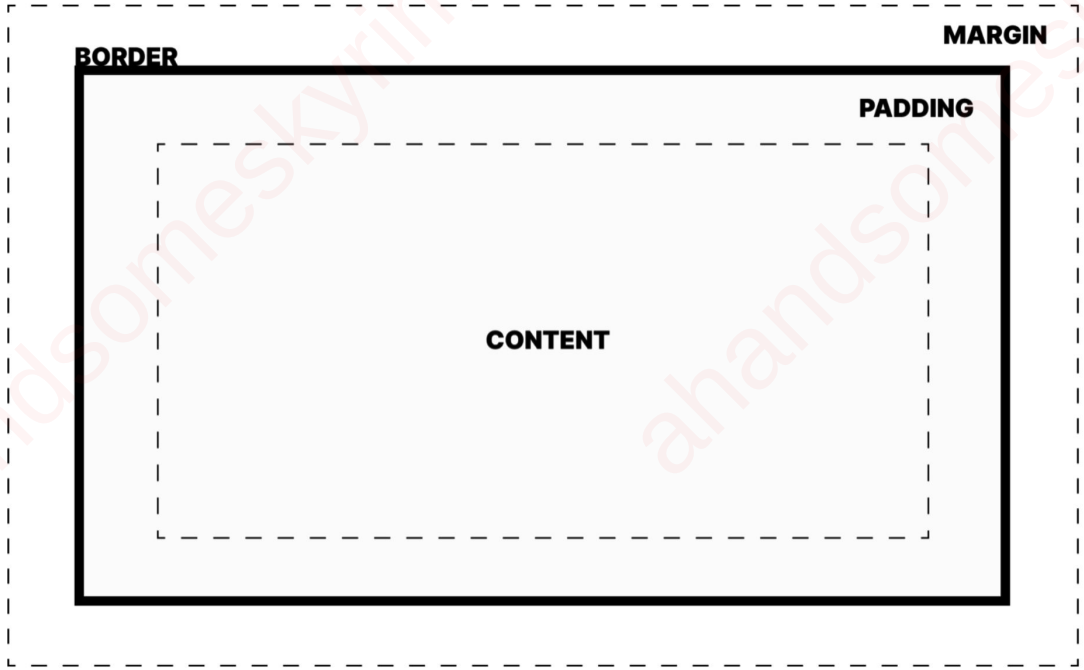
Browser inconsistencies

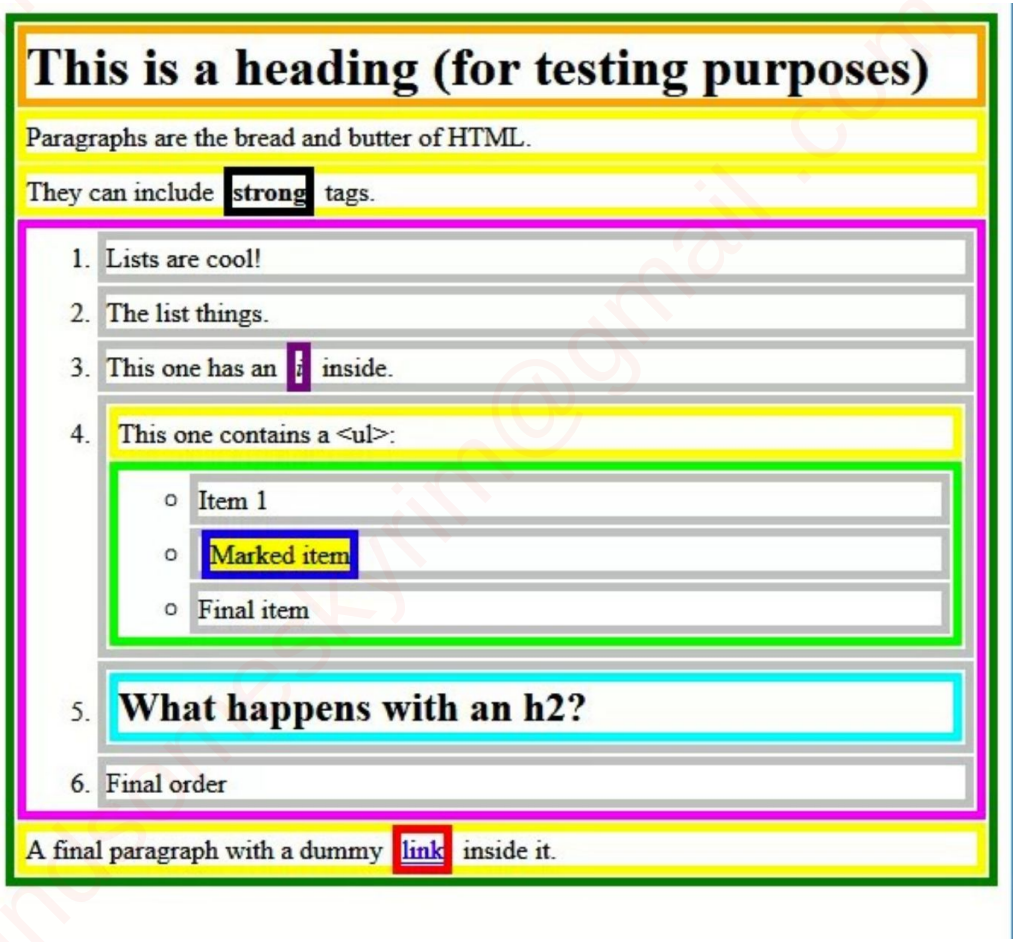
- Some browsers handle styles differently than others. (i.e. color, fonts, general support for new CSS features)
- If a browser is parsing your CSS rules, and encounters a property or value that it doesn't recognize, it ignores it and moves on to the next declaration.
- The previous point is actually a feature. This allows you to incorporate new CSS features before they are widely supported so long as you incorporate fallback.

https://caniuse.com/

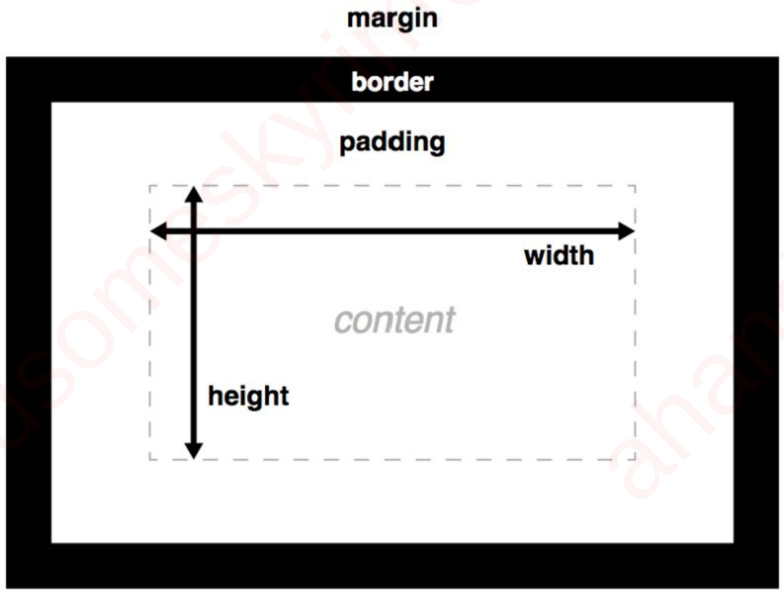
1. CSS介绍

CSS Box Model





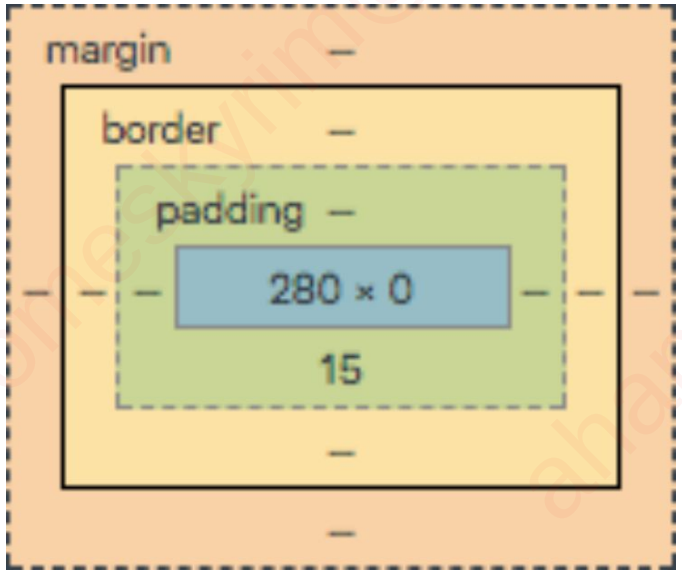
CSS Box Model



- Content - The content of the box, where text and images appear
- Padding - Clears an area around the content. The padding is transparent
- Border - A border that goes around the padding and content
- Margin - Clears an area outside the border. The margin is transparent

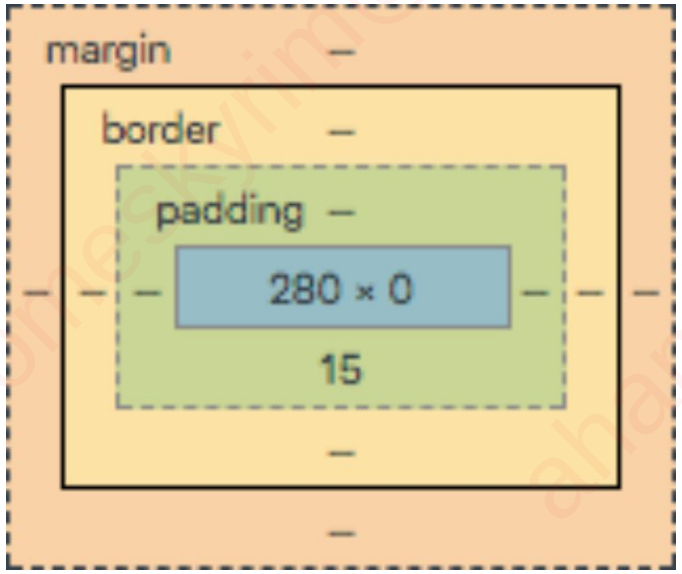
1. CSS介绍

Margin, Border, Padding



- margin
  - margin-top
  - margin-bottom
  - margin-right
  - margin-left
- border <width style color>
  - border-style
  - border-width
  - border-color
- padding
  - padding-top
  - padding-right
  - padding-bottom
  - padding-left

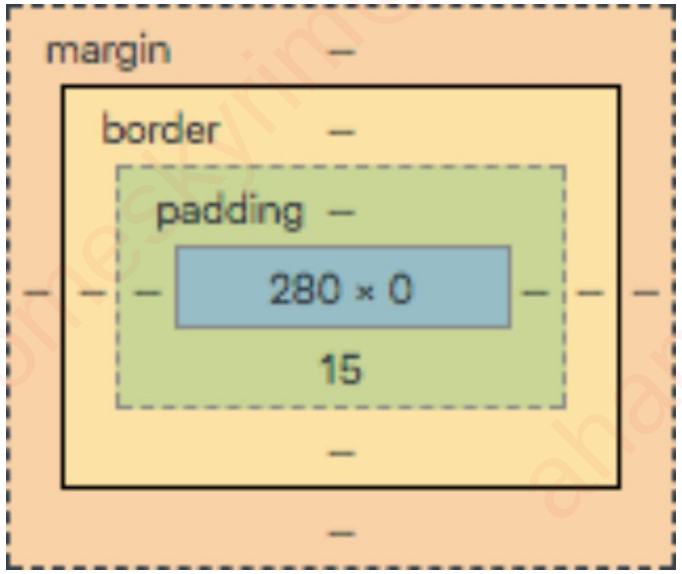
Margin, Border, Padding



- margin: 25px 50px 75px 100px;
  - top margin is 25px
  - right margin is 50px
  - bottom margin is 75px
  - left margin is 100px
- margin: 25px 50px 75px;
  - top margin is 25px
  - right and left margins are 50px
  - bottom margin is 75px
- margin: 25px 50px;
  - top and bottom margins are 25px
  - right and left margins are 50px
- margin: 25px;
  - all four margins are 25px

1. CSS介绍

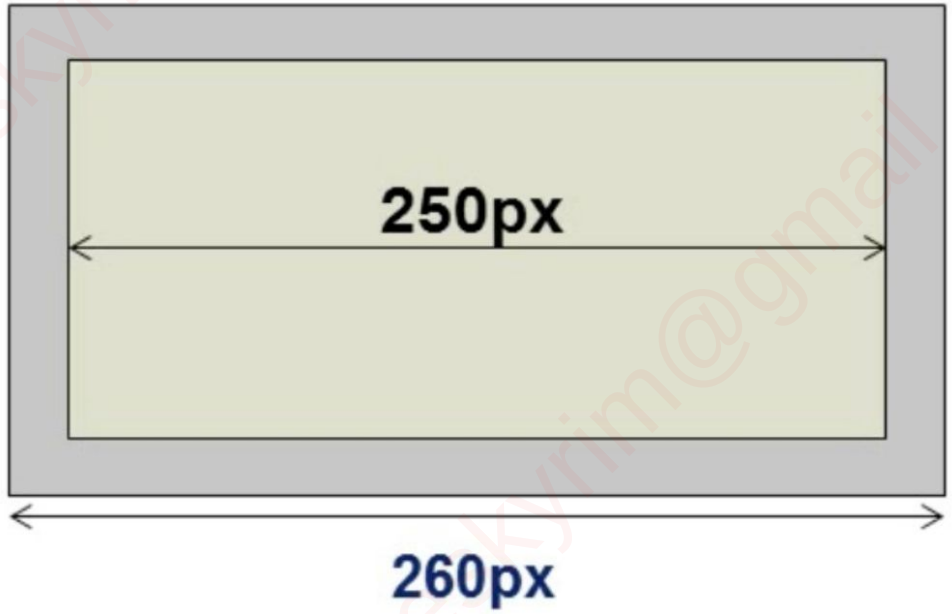
Margin, Border, Padding



- padding:10px 5px 15px 20px;
  - top padding is 10px
  - right padding is 5px
  - bottom padding is 15px
  - left padding is 20px
- padding:10px 5px;
  - top and bottom padding are 10px
  - right and left padding are 5px
- padding:10px 5px 15px;
  - top padding is 10px
  - right and left padding are 5px
  - bottom padding is 15px
- padding:10px;
  - all four paddings are 10px

Box Width

```
ul li
{
   width: 250px;
}
```



Margin, padding, and border are additive

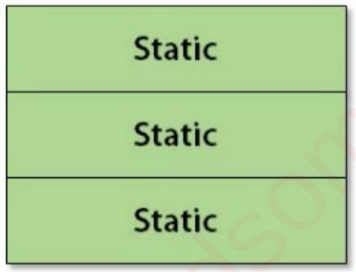
Display and visibility

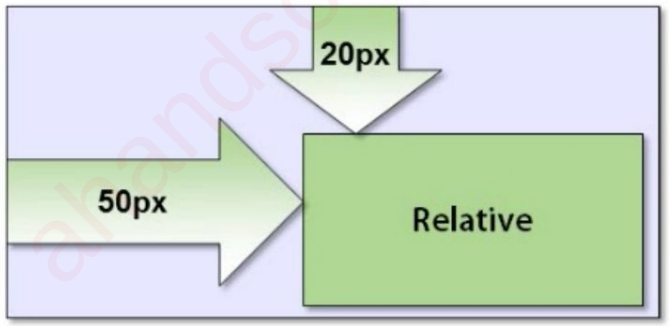
- Display is generally block , inline , or **none**
  - block elements sit on top of each other
  - Inline elements only move downward when there is not enough space
  - Display of none removes an element
- **Visibility**
  - Hidden elements are not visible but reserve space

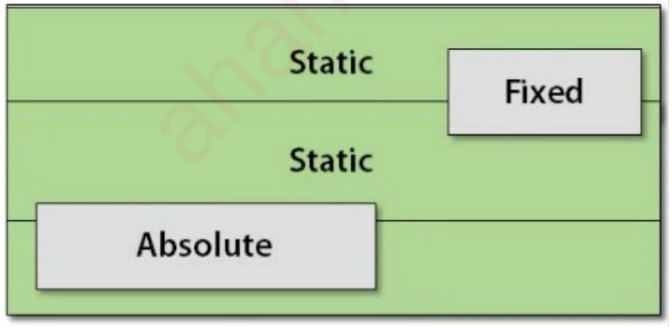
display: none VS visibility: hidden

Display and visibility

```
#links
{
    position: relative;
    top: 20px;
    left: 50px;
}
```





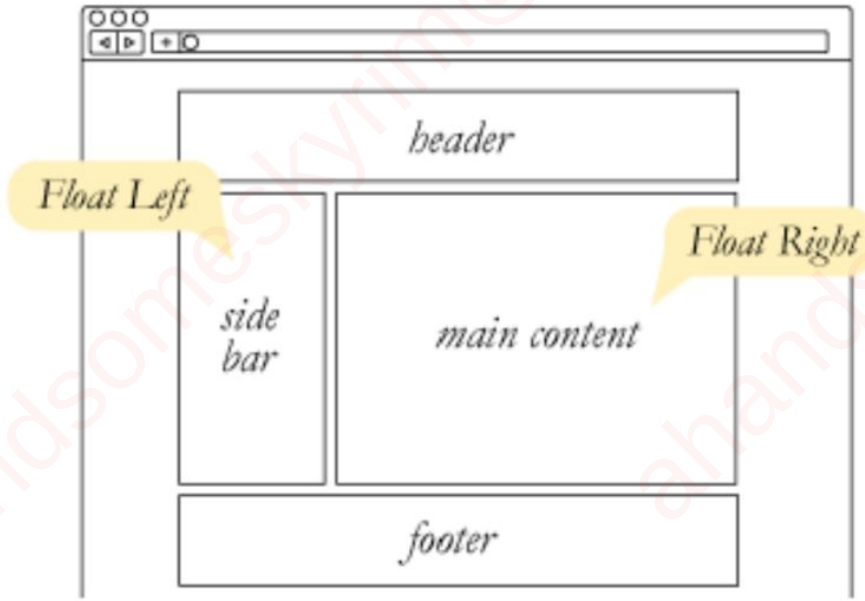


Position

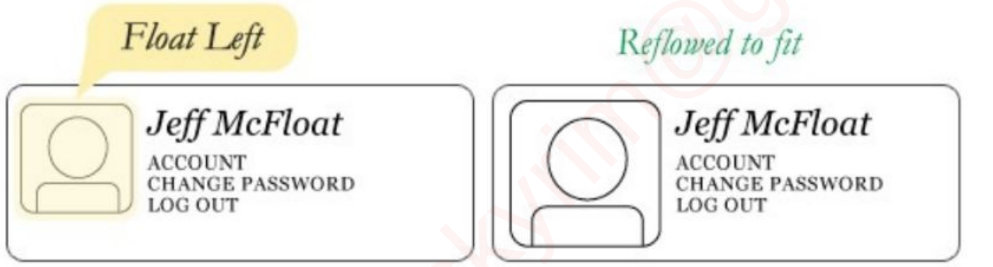
- position: absolute
  - 绝对定位的元素完全脱离。对于包围它的元素而言，视为不存在。可以通过top, right，bottom, left 控制定位
- position: relative
  - 相对定位
- position: fixed
  - 绝对定位，相对于浏览器窗口来定位
- position: static (默认)
  - 一个 static 定位的元素会忽略所有 top, right，bottom, left 以及 z-index 属性所声明的值
- position: inherit (继承)

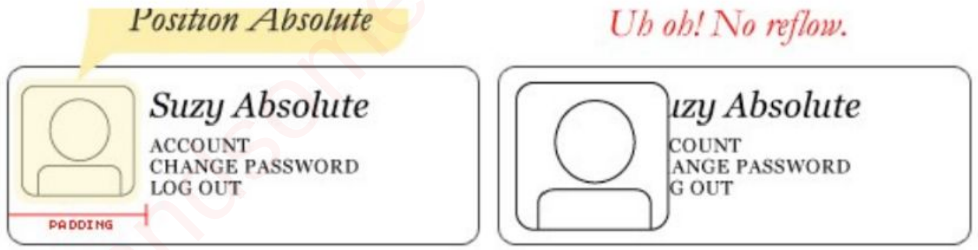
1. CSS介绍

Float and Clear

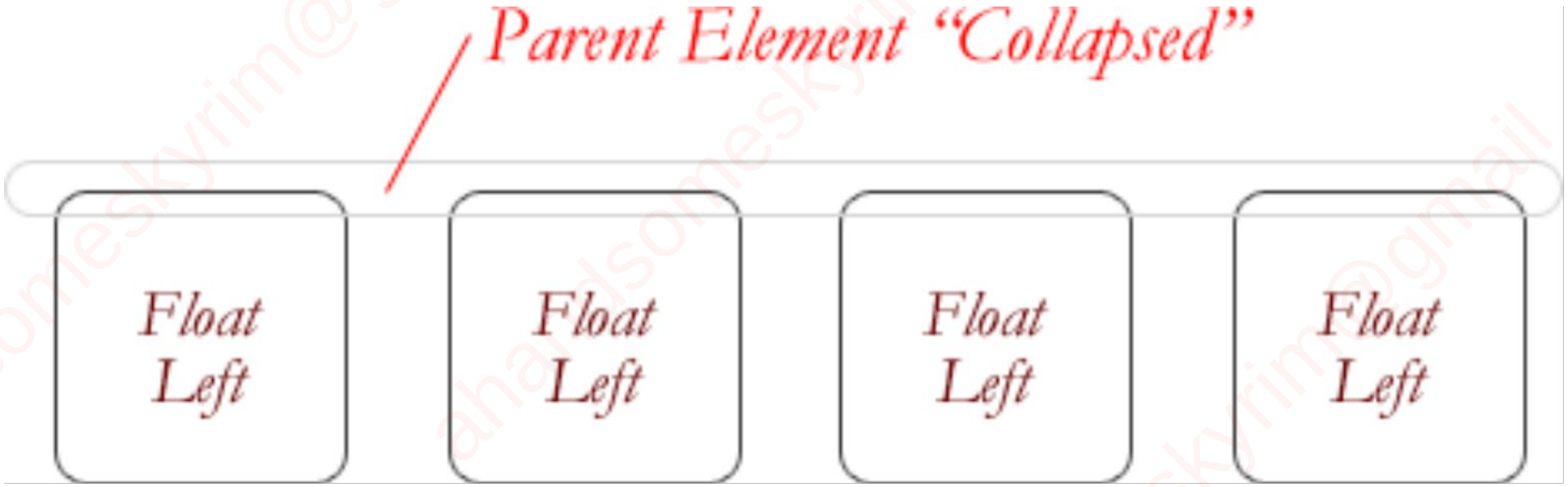


float: right
float: left
float: none
float: clear





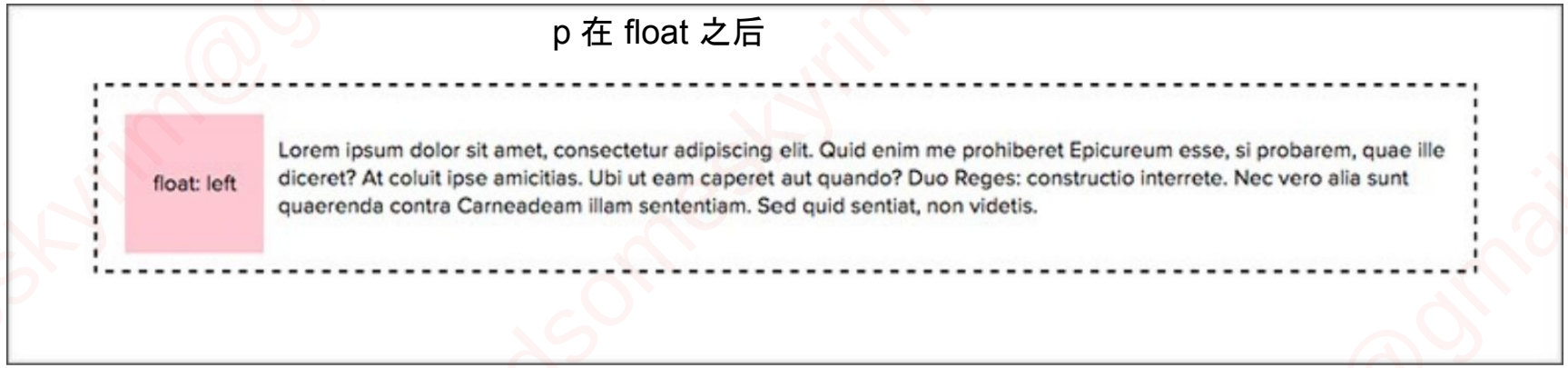
Float and Clear

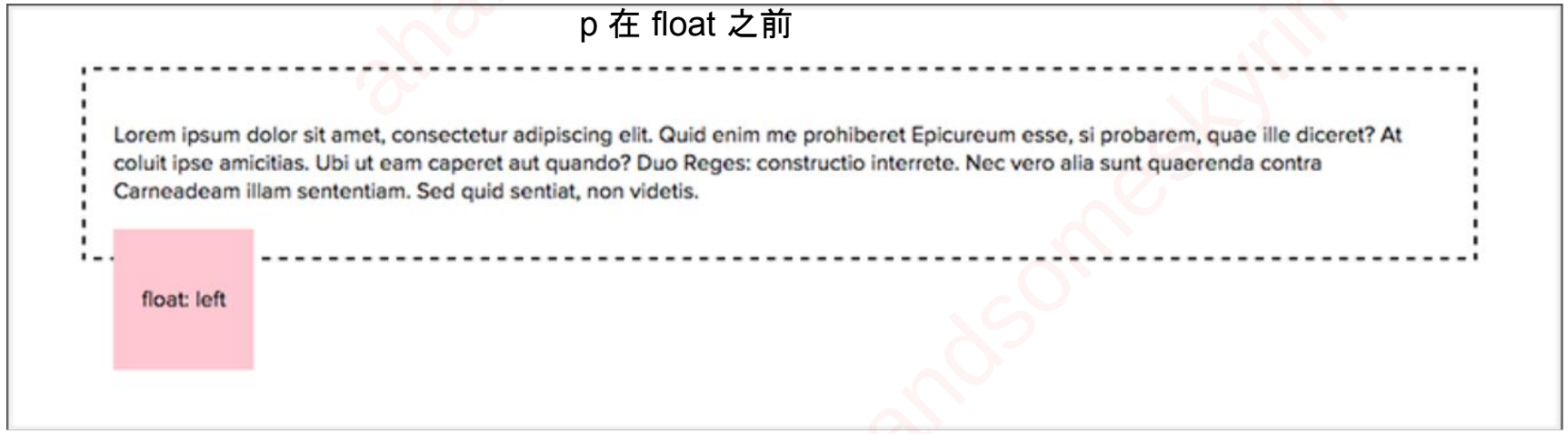


浮动元素会脱离文档流，不会继续停留在其父元素内。如果一个父元素只有一个子元素，那么它将会塌陷，就像是空的一样。就表现而言，就有点类似于子元素做了绝对定位。

1. CSS介绍

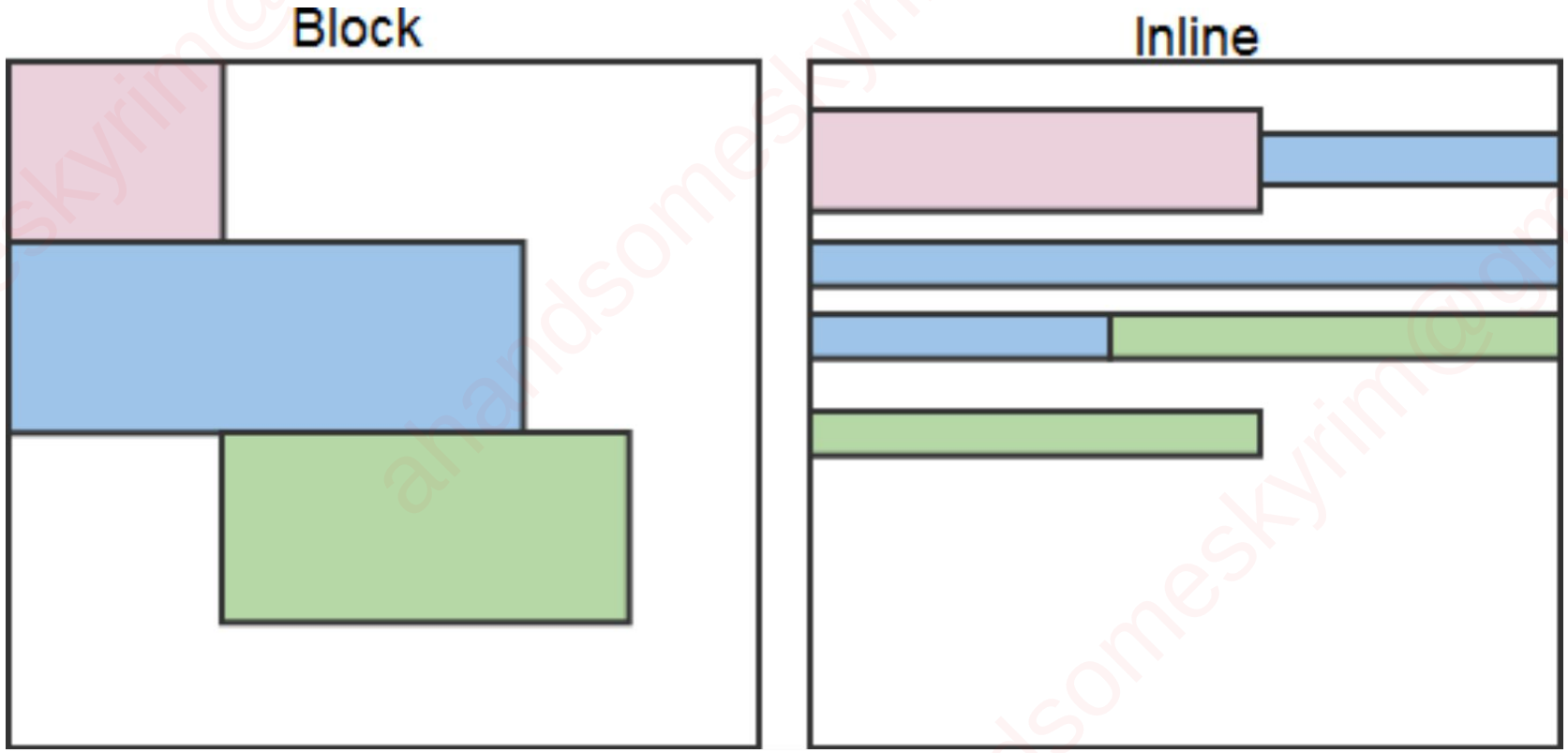
Float and Clear





1. CSS介绍

Block, Inline, Inline-block



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Block, Inline, Inline-block

```
.inline-element {
  display: inline;
  width: 1000px; /* ❌ won't have any effect */
  height: 1000px; /* ❌ won't have any effect */
}
```

```
.inline-block-element {
  display: inline-block;
  width: 1000px; /* ✅  yes, it will work */
  height: 1000px; /* ✅  yes, it will work */
}
```

1. CSS介绍

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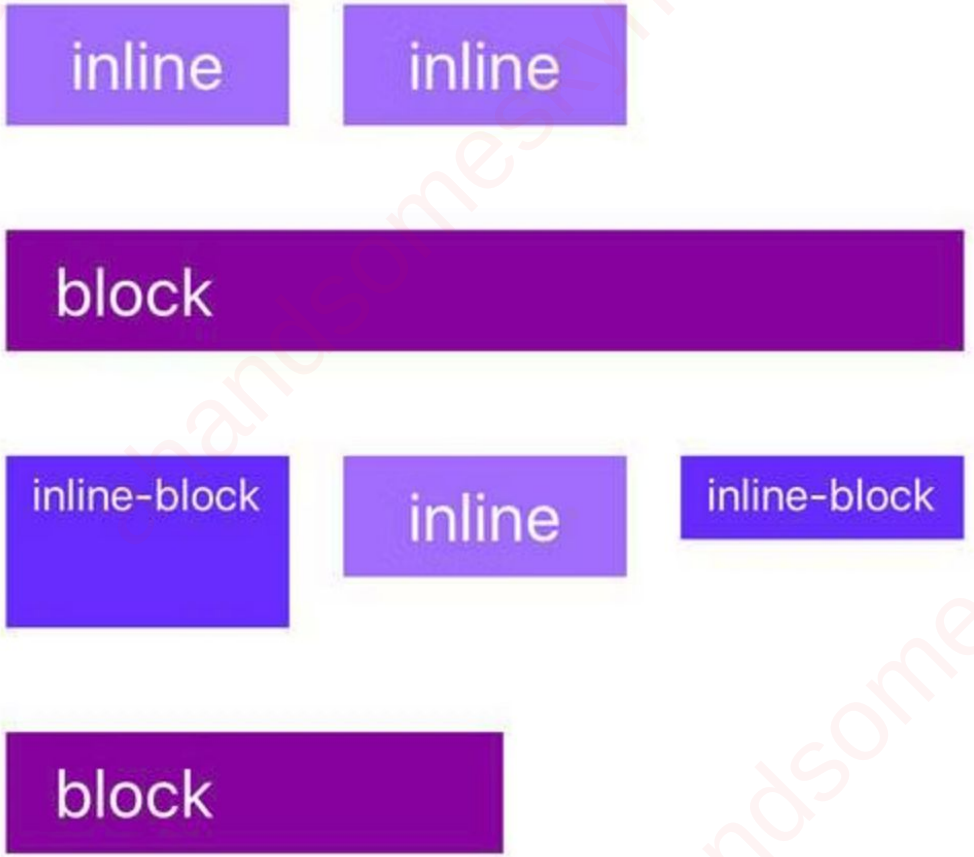
Block, Inline, Inline-block



Position

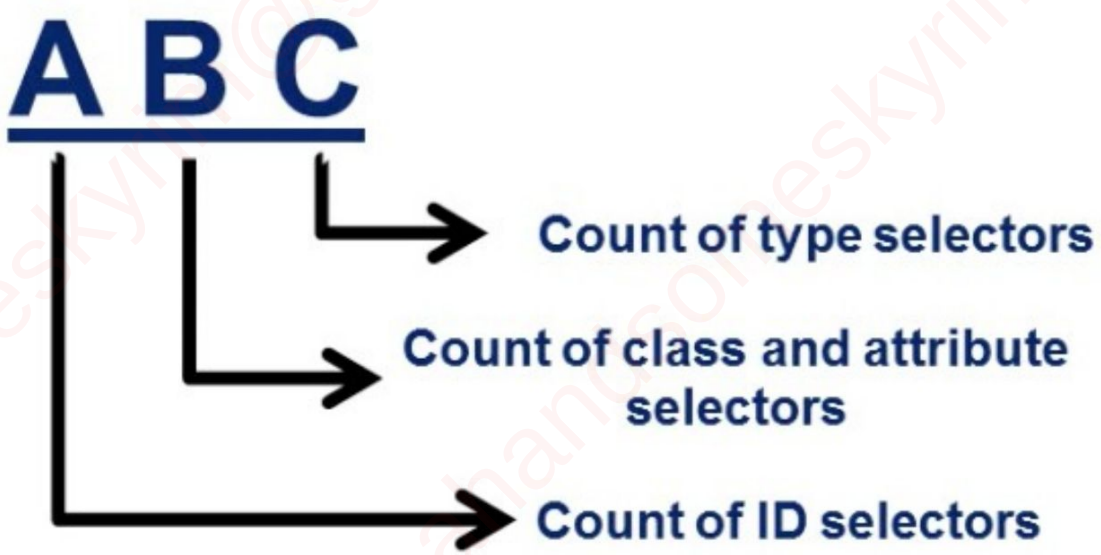
- static, 该关键字指定元素使用正常的布局行为，即元素在文档常规流中当 前的布局位置。此时 top, right, bottom, left 和 z-index 属性无效。
- relative, 该关键字下，元素先放置在未添加定位时的位置，再在不改变页 面布局的前提下调整元素位置（因此会在此元素未添加定位时所在位置留 下空白）

- absolute, 不为元素预留空间，通过指定元素相对于最近的非 static 定位祖 先元素的偏移，来确定元素位置。绝对定位的元素可以设置外边距（margins），且不会与其他边距合并。
- fixed, 不为元素预留空间，而是通过指定元素相对于屏幕视口（viewport） 的位置来指定元素位置。元素的位置在屏幕滚动时不会改变。

Position

- top
- bottom
- right
- left
- z-index

Specificity




```
*               /* a=0 b=0 c=0 -> specificity =   0 */
LI              /* a=0 b=0 c=1 -> specificity =   1 */
UL LI           /* a=0 b=0 c=2 -> specificity =   2 */
LI.red          /* a=0 b=1 c=1 -> specificity =  11 */
#content        /* a=1 b=0 c=0 -> specificity = 100 */
```

Specificity

Specificity levels come in four categories:

- **Inline styles (style in document)**: An inline style is within the HTML document. It is attached directly to the element to be styled. <h1 style=”color: #777;”>
- **ID (# of ID selectors)**: ID is an identifier for single page elements, such as #span.
- **Classes, attributes and pseudo-classes**: This category includes .classes, [attributes] and pseudo-classes such as :hover and :focus
- **Elements and pseudo-elements (# of Element (type) selectors)**: Things such as h1, div, :before and :after.

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Specificity

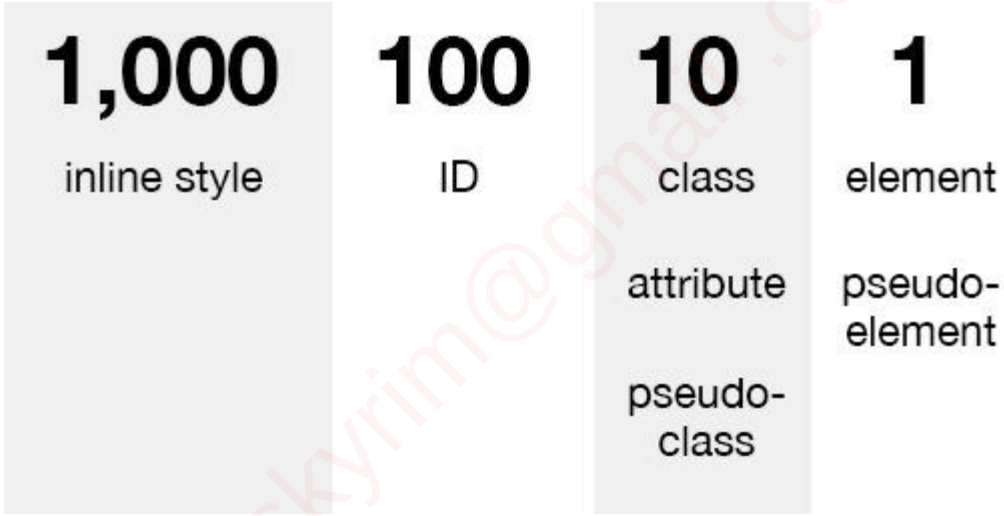
An inline style is worth 1000.

An ID is worth 100.

An attribute, class or pseudo-class is worth 10.

A single element or pseudo-element is worth 1.

(1,0,0,0)



Specificity

Selector	Specificity value
* { }	0*
li { }	1 (one element – 0,0,0,1)
li:first-line { }	2 (one element, one pseudo-element – 0,0,0,2)
ul li { }	2 (two elements – 0,0,0,2)
ul ol+li { }	3 (three elements – 0,0,0,3)
h2 + *[rel=up] { }	11 (one attribute, one element – 0,0,1,1)
ul ol li.first { }	13 (one class, three elements – 0,0,1,3)
li.last.winner { }	21 (two classes, one element – 0,0,2,1)
style=""	1000 (one inline styling – 1,0,0,0)
div p.special-text { }	12 (two HTML selectors and a class selector – 0,0,1,2)
#client-name { }	100 (one id selector – 0,1,0,0)
body #item-list .post p { }	112 (id selector, class selector, 2 HTML selectors – 0,1,1,2)

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Quiz

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Q & A