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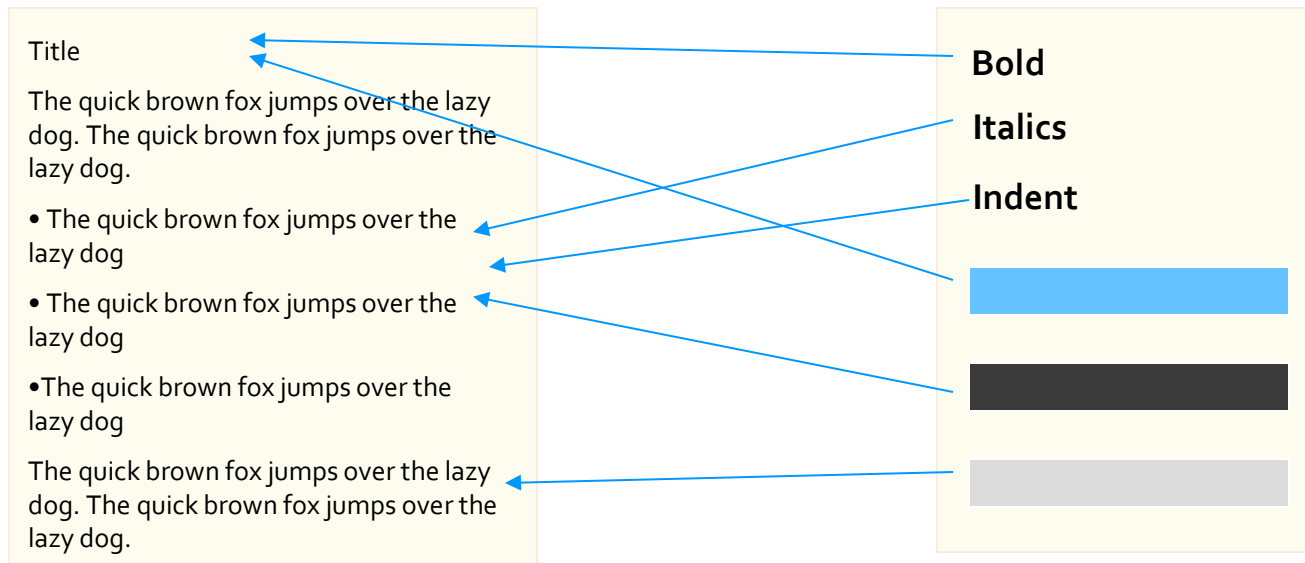
Why CSS?

- Separate content from presentation!



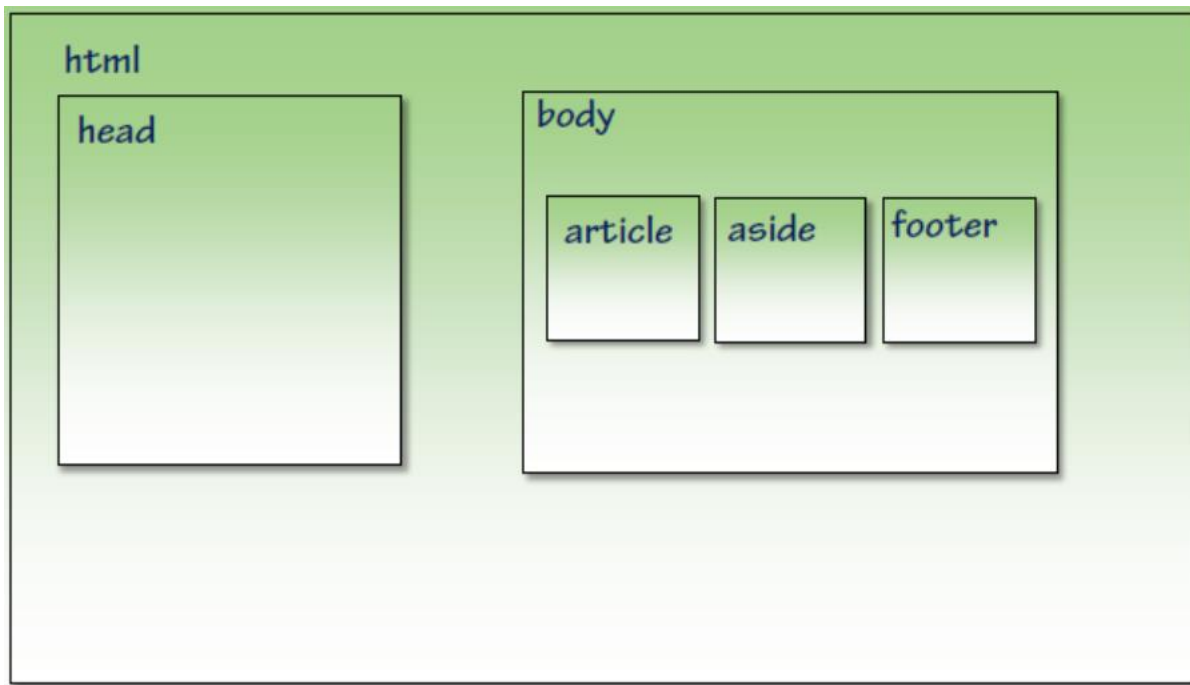
Content
(HTML document)

Presentation
(CSS document)



CSS Introduction

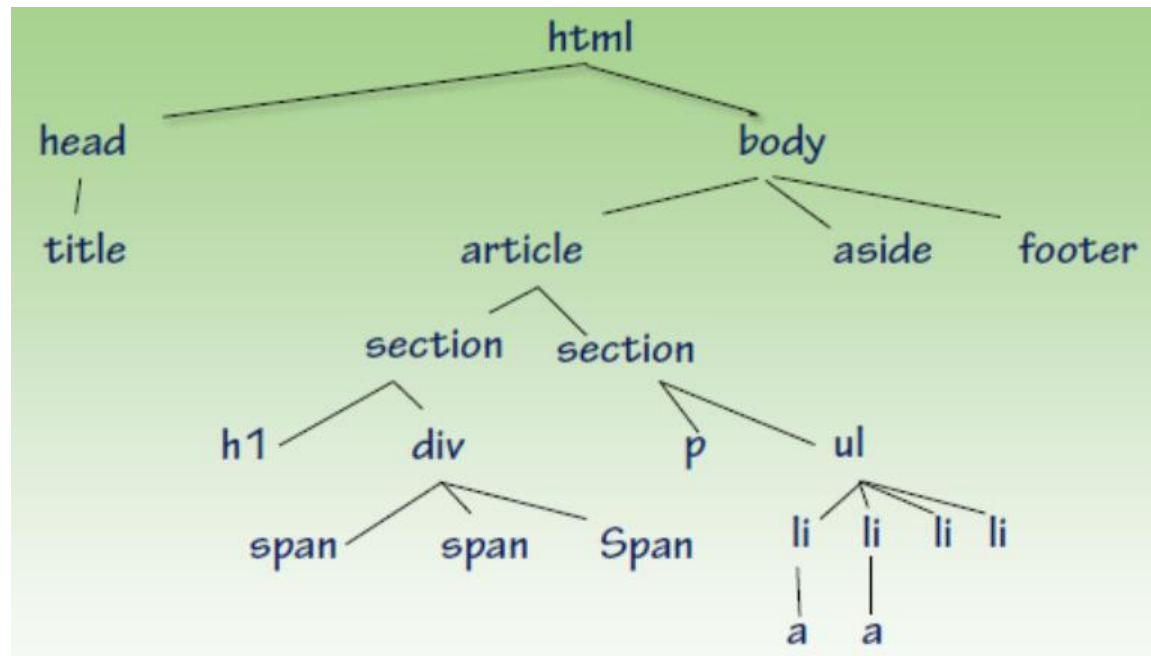
- Cascading Style Sheets (CSS)
 - Used to **describe** the presentation of documents
 - Define **sizes, spacing, fonts, colors, layout**, etc.
- Designed to separate presentation from content
 - Ensure **consistent look and feel**
 - Improve **reusability** and **maintainability**
- Due to CSS, all HTML presentation tags and attributes are deprecated, e.g. **font, center**, etc.



An HTML document in the browser as a **Document Object Model (DOM) Tree**

Relationships between elements

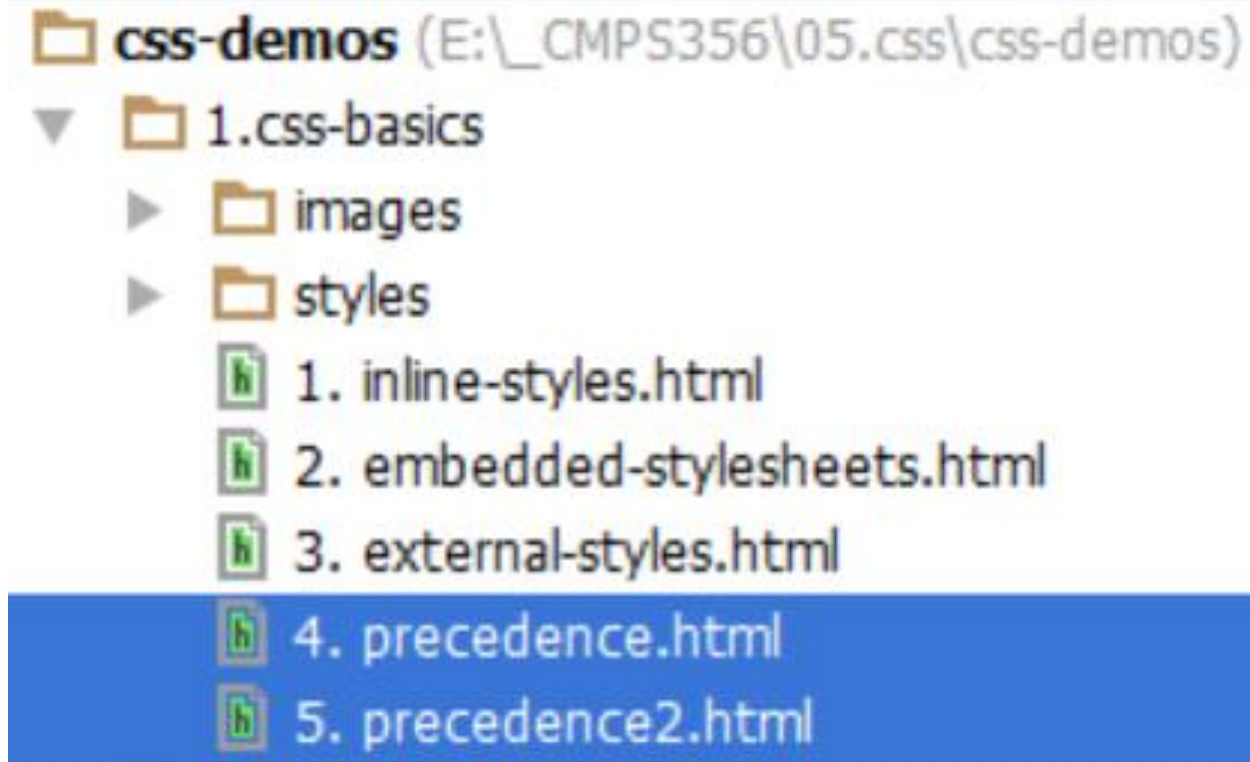
- Ancestor
- Descendent
- Parent
- Child
- Sibling



Why “Cascading”?

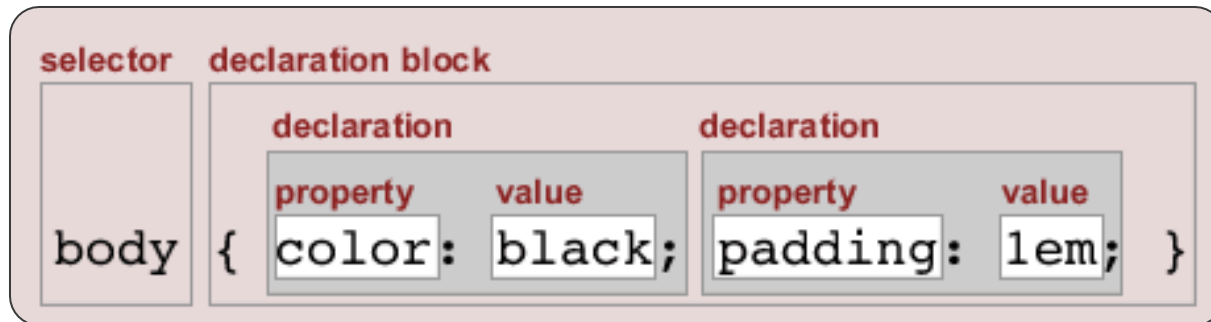
- Descendant elements in the HTML DOM tree **inherit** styles from their Ancestors
 - **Nearest ancestor wins**
 - Child can override the inherited style (More specific styles win over inherited styles)
- Cascading saves time and effort
- Text-related and list-related properties are inherited - `color`, `font-size`, `font-family`, `line-height`, `text-align`, `list-style`, etc.
- Some CSS styles are not inherited
 - Box-related and positioning styles are not inherited - `width`, `height`, `border`, `margin`, `padding`, `position`, `float`, `background colors`, etc.
 - `<a>` elements do not inherit `color` and `text-decoration`

CSS Rules Precedence - Examples



Style Sheets Syntax

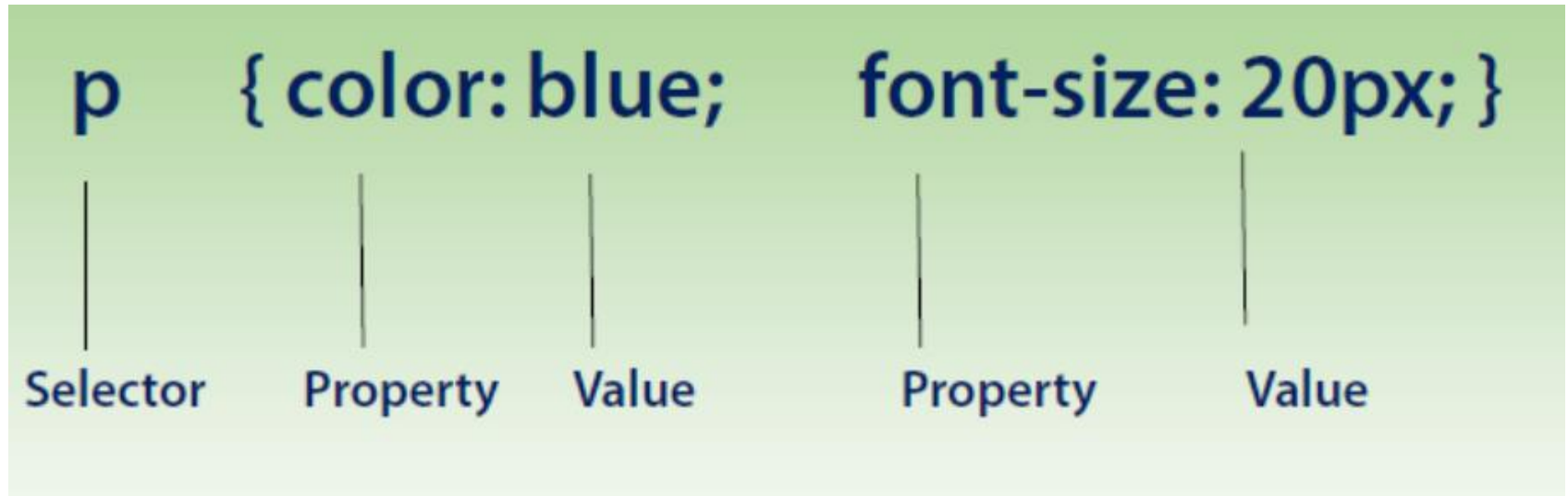
- Stylesheets consist of **rules**. Each rule has **selectors** and **declarations**. A declaration specifies a **property** and its **value**.



- **Selectors** are separated by commas.
- **Declarations** are separated by semicolons
- **Properties** and **values** are separated by colons

```
h1,h2,h3 { color: green; font-weight: bold; }
```


Example



Selectors are used to select elements on an HTML page so that they can be styled

Basic Selectors

- **Tag Selectors**

- Apply page-wide

e.g., **p { font-family: verdana; }** applies the style to all `<p>` tags

- **Class Selectors**

- Defines a **named** style (prefix the name with dot (.))
- Can apply to any page element using the class attribute

e.g., **.redBorder {border: 1px solid red}** defines a style named redBorder

<p class='redBorder'>Using the class attribute to apply the redBoder style to this paragrpah**</p>**

- **ID Selectors**

- Apply to one specific tag
- Use hash (#) followed by the tag id to select the element to be styled
- Good for linking to specific part of a page

e.g., **#errorMsg { color: red; }** apply the style to the element with id **errorMsg**

Selector Examples

- Three primary kinds of selectors:
 - Tag selectors(aka Type selectors):

```
h1 { font-family: verdana,sans-serif; }
```

- Class Selectors:

```
.redBorder {border: 1px solid red}
```

- ID Selectors:

```
#errorMsg { color: red; }
```

- Selectors can be combined with commas:

```
h1, .link, #topLink {font-weight: bold}
```

This will match **<h1>** tags, elements with class **link**, and the element with id **topLink**

- Comment in CSS ***/* comment */***

Linking HTML and CSS

- **HTML** (content) and **CSS** (presentation) can be linked in three ways:
 - **Inline**: the CSS rules in the **style** attribute
 - No selectors are needed
 - **Embedded**: in the `<head>` in a `<style>` tag
 - **External**: CSS rules in separate file (best)
 - A file with **.css** extension
 - Linked via Link tag
- `<link rel="stylesheet" href="...">`

Inline Styles

- CSS rules in the element's **style** attribute
- No need for selectors
 - Acts on the element on which it is set
- Not recommended
 - It mixes content with presentation
 - The CSS idea is to avoid that mixing

Example - Inline Styles

Example: inline-styles.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Inline Styles</title>
</head>
<body>
  <p>Here is some text</p>
  <!--Separate multiple styles with a semicolon-->
  <p style="font-size: 20pt">Here is some
    more text
  </p>
  <p style="font-size: 20pt;color:#0000FF">
    Even more text
  </p>
</body>
</html>
```

Here is some text

Here is some more text

Even more text

Example - Embedded Styles

- Used for document-specific styles

Example: [embedded-stylesheets.html](#)

```
<!DOCTYPE html>
<html>
<head>
  <title>Style Sheets</title>
  <style type="text/css">
    em {background-color:#8000FF; color:white}
    h1 {font-family:Arial, sans-serif}
    p  {font-size:18pt}
    .blue {color:blue}
  </style>
</head>
```

Example

Embedded Styles (cont.)

...

```
<body>
  <header>
    <h1 class="blue">
      A Heading
    </h1>
  </header>
  <article>
    <p>Here is some text. Here is some text.
    Here is some text. Here is some text. Here
    is some text.</p>
    <h1>Another Heading</h1>
    <p class="blue">Here is some more text.
    Here is some more text.</p>
    <p class="blue">Here is some <em>more</em>
    text. Here is some more text.</p>
  </article>
</body>
</html>
```

A Heading

Here is some text. Here is some text. Here is some text. Here is some text. Here is some text.

Another Heading

Here is some more text. Here is some more text.

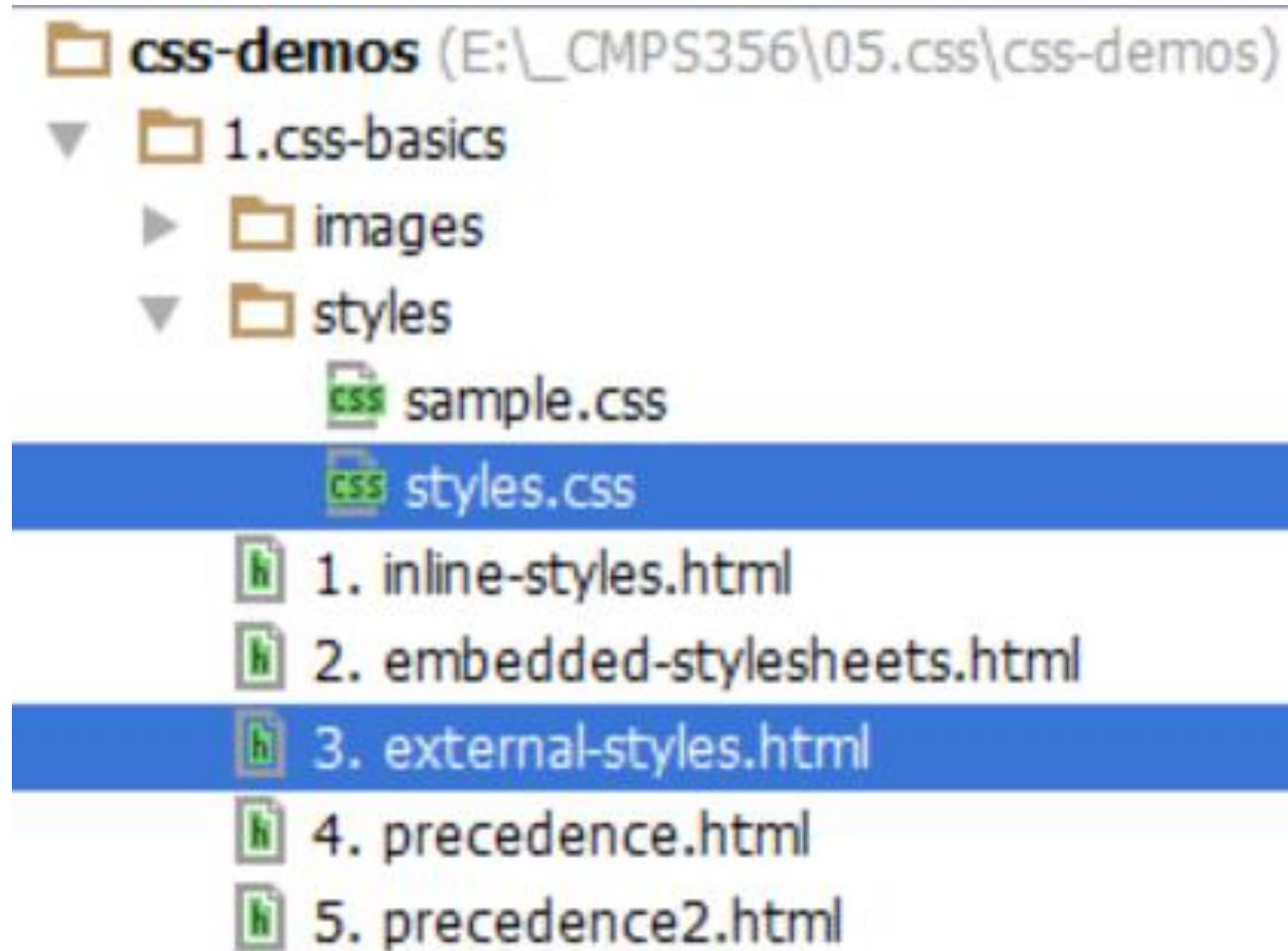
Here is some *more* text. Here is some more text.

External CSS Styles

- Using external files is highly recommended
 - **Separation of concerns:** separates content from presentation
 - Simplifies the HTML document
 - Increases reusability
 - Eases maintainability
 - Insures consistent look and feel across the entire website
 - Only modify a single file to change the styles across the entire Web site
 - Faster page loading as the CSS file is cached
- **<link>** tag in the document **<head>** to link html document with ccs document

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

Example - External Styles



Selectors

Combined Selectors

- Match relative to element placement:

```
p a {text-decoration: underline}
```

This will match all **<a>** tags that are inside of **<p>**

Attribute Selectors

- `E[foo^="bar"]`
 - An **E** element whose "foo" attribute value begins with the string "bar"
 - Example: `a[src^="https://"]`
`{ background-color: yellow; }`
- `E[foo$="bar"]`
 - An **E** element whose "foo" attribute value ends with the string "bar"
- `E[foo*="bar"]`
 - An **E** element whose "foo" attribute value contains the substring "bar"

Pseudo-classes

- Pseudo-classes define state
 - `:hover`, `:visited`, `:active`
- Pseudo-elements define element "parts" or are used to generate content
 - `:first-line`, `:before`, `:after`

```
a:hover { color: red; }  
p:first-line { text-transform: uppercase; }  
.title:before { content: "»"; }  
.title:after { content: "«"; }
```

Structural Pseudo-classes

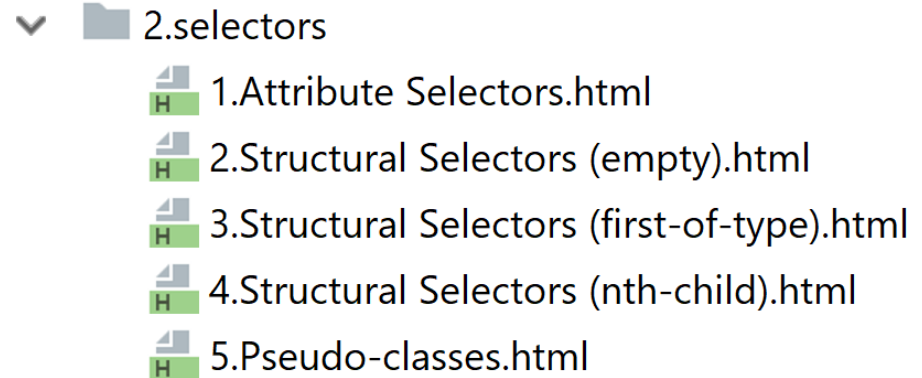
- **E:nth-child(n)**
 - An **E** element, the n-th child of its parent
- **E:nth-last-child(n)**
 - An **E** element, the n-th child of its parent, counting from the last one
- **E:last-child**
 - An **E** element, the last child of its parent

<http://www.w3.org/TR/css3-selectors/#structural-pseudos>

Summary

- A style consists of a selector, followed by property/value pairs
- Selectors:
 - Tag Selectors
 - Class Selectors
 - ID Selectors
 - Combined Selectors
 - Attribute selectors
 - Pseudo-elements
 - Structural pseudo-classes

Examples



Text Styles

Text-related CSS Properties

- **color** – specifies the color of the text
- **font-size** – size of font: `xx-small`, `x-small`, `small`, `medium`, `large`, `x-large`, `xx-large`, `smaller`, `larger` or numeric value
- **font-family** – comma separated font names
 - Example: `verdana`, `sans-serif`, etc.
 - The browser loads the first one that is available
 - There should always be at least one generic font
- **font-weight** can be `normal`, `bold`, `bolder`, `lighter` or a number in range [100 ... 900]

CSS Rules for Fonts (2)

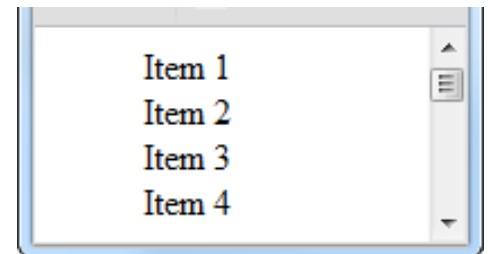
- **font-style** – styles the font
 - Values: **normal**, **italic**, **oblique**
- **text-decoration** – decorates the text
 - Values: **none**, **underline**, **line-through**, **overline**, **blink**
- **text-align** – defines the alignment of text or other content
 - Values: **left**, **right**, **center**, **justify**

List Styles

Styles for Lists

- List properties are used to define the look and feel of the list items
 - Mainly to change the list item marker
- Normal styles:
 - **List-style-type**
 - Values for ``: `circle`, `square`,...
 - Values for ``: `upper-roman`, `lower-alpha`
 - Values for both: `none`

```
ul
{
    list-style-type:none;
}
```



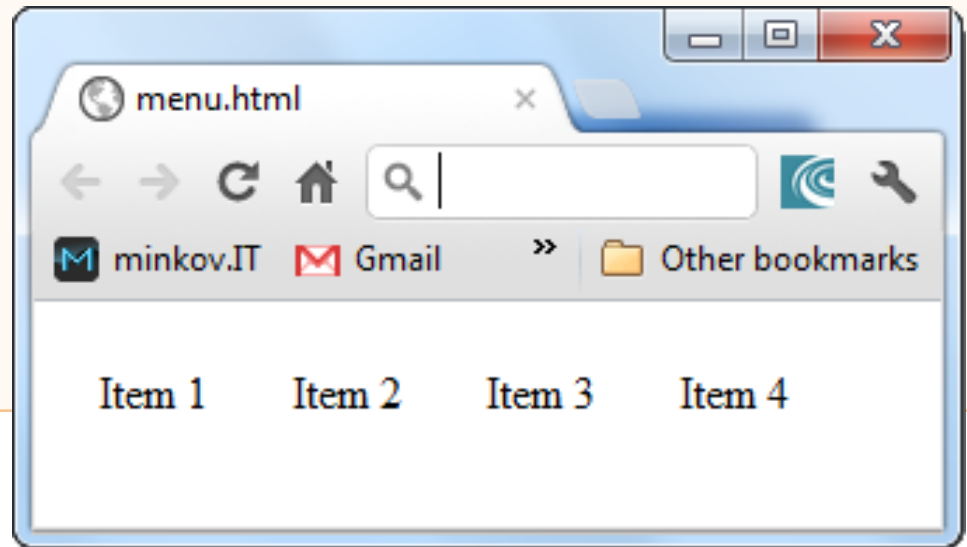
Create Navigation Bar

- A Navigation bar is a set of links
 - A list of the different areas on your site
- Place the link in Unordered List ``
- Remove the bullets (`list-style-type: none;`)
- Eliminate padding and margins
- Set the display to inline-block to eliminate new lines
- Style the links
 - Remove the underline
 - Set the color
 - Surround with a border

Creating a Menu-like List

```
ul.menu
{
  list-style-type: none;
  padding: 0px;
  margin: 0px;
}

li.menu-item
{
  float: left;
  margin: 10px;
}
```





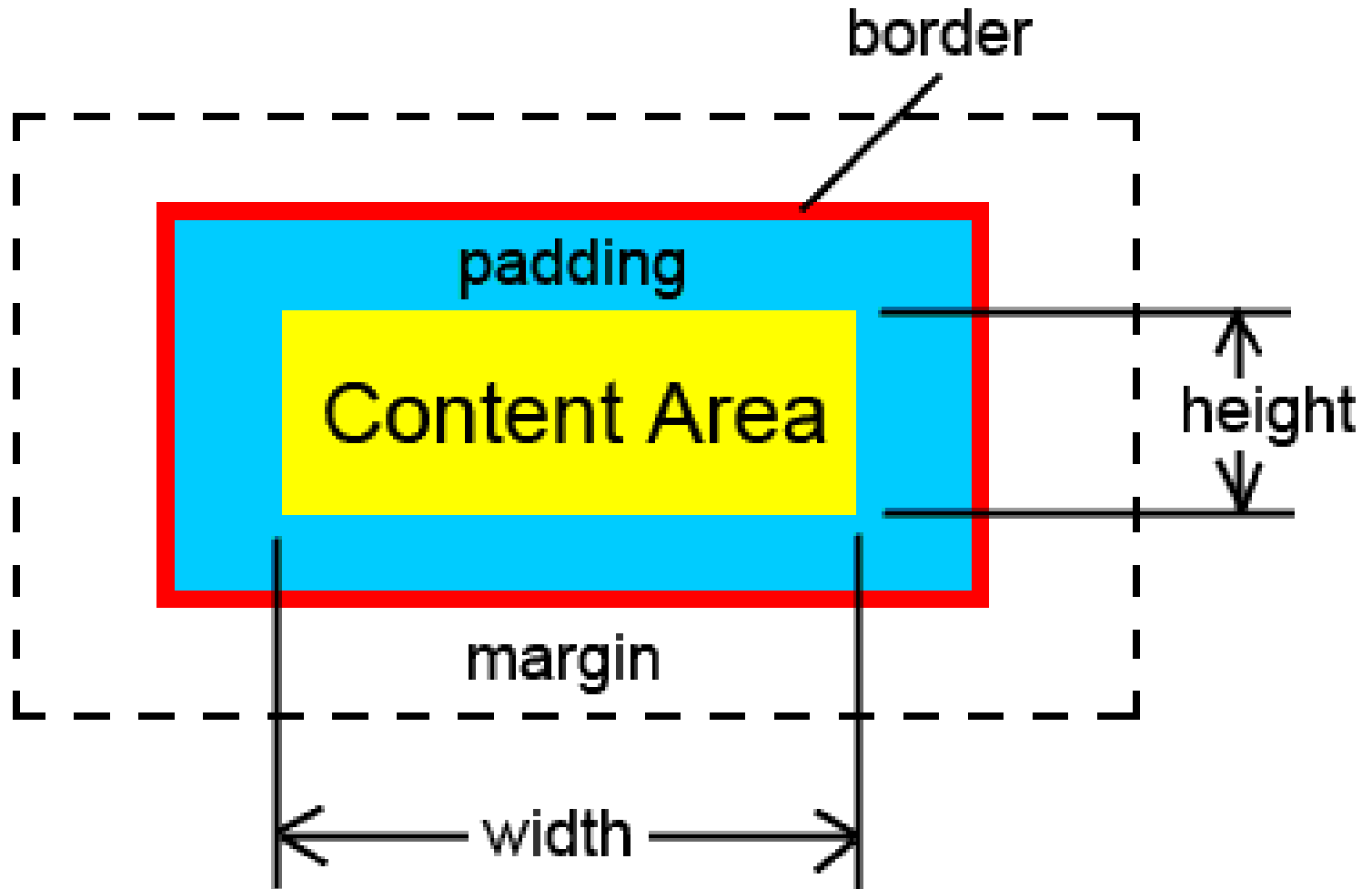
Margins, Borders and Padding

Example: [margins-paddings-rules.html](https://www.w3schools.com/css/css_margin.asp)

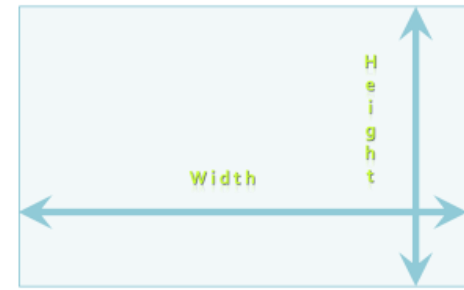
Margins, Borders and Padding

- Understanding the box model
 - A paragraph is a box
 - An image is a box
 - Each tag is a box
 - Boxes within boxes
- **Margin** –the space that separates the boxes
- **Padding** –the space between the border and the contents
- **Border** –the line around each edge of the box

The Box Model



Width and Height



- **width** – defines numerical value for the width of element, e.g. **200px**
- **height** – defines numerical value for the height of element, e.g. **100px**
 - By default the height of an element is defined by its content

Margin and Padding

- **margin** and **padding** define the spacing around the element
 - Numerical value, e.g. **10px** or **-5px**
 - Can be defined for each of the four sides separately - **margin-top**, **padding-left**, ...
 - **margin** is the spacing outside of the border
 - **padding** is the spacing between the border and the content

```
width: 300px;  
border: 1px solid black;  
padding: 5px;
```

Margin and Padding: Short Rules

- `margin: 5px;`
 - Sets all four sides to have margin of 5 px;
- `margin: 10px 20px;`
 - top and bottom to 10px, left and right to 20px;
- `margin: 5px 3px 8px;`
 - top 5px, left/right 3px, bottom 8px
- `margin: 1px 3px 5px 7px;`
 - top, right, bottom, left (clockwise from top)
- Same for `padding`

Borders

- **border-width**: thin, medium, thick or numerical value (e.g. 10px)
- **border-color**: color alias or RGB value
- **border-style**: none, hidden, dotted, dashed, solid, double, groove, ridge, inset, outset
- Each property can be defined separately for left, top, bottom and right
 - border-top-style, border-left-color, ...

Border Shorthand Property

- **border**: shorthand rule for setting border properties at once:

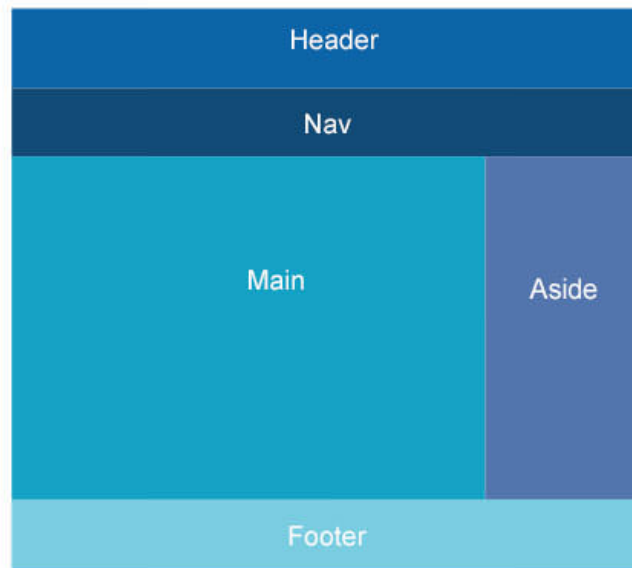
```
border: 1px solid red
```

is equal to writing:

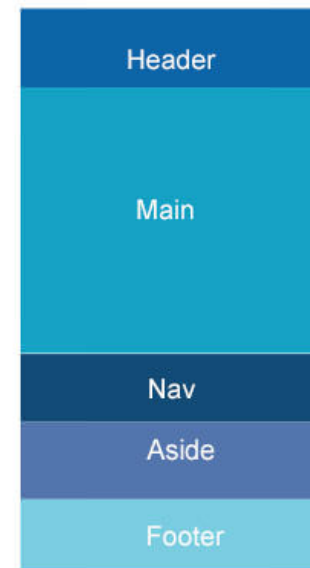
```
border-width:1px;  
border-color:red;  
border-style:solid;
```

- Specify different borders for the sides via shorthand rules: **border-top**, **border-left**, **border-right**, **border-bottom**

Flexible Box Layout (flexbox)



Desktop

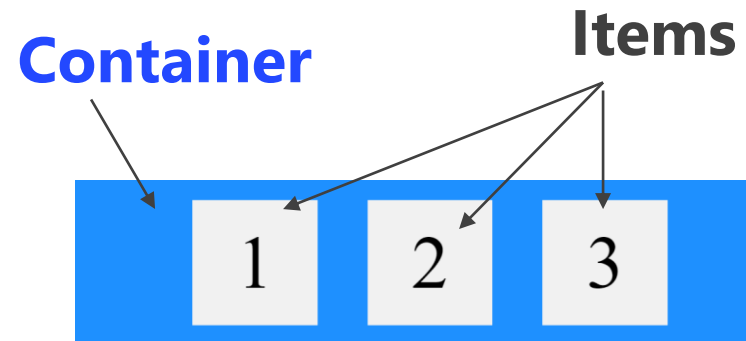


Mobile

Flexbox

- The Flexbox provide a more efficient way to lay out, align and distribute space among items in a container while accommodating different screen sizes.

```
.flex-container {  
  display: flex;  
  justify-content: center;  
}  
  
<div class="flex-container">  
  <div>1</div>  
  <div>2</div>  
  <div>3</div>  
</div>
```



https://www.w3schools.com/css/css3_flexbox.asp

References

- CSS Tutorials

<http://www.w3schools.com/css/>

<https://css-tricks.com/snippets/css/a-guide-to-flexbox/>

- CSS developer guide

<https://developer.mozilla.org/en-US/docs/Web/Guide/CSS>

- Selectors

- <http://code.tutsplus.com/tutorials/the-30-css-selectors-you-must-memorize--net-16048>

- <http://www.quirksmode.org/css/selectors/>