CSS:
Cascading Style Sheets

Lecture 16

Evolution of CSS

- ☐ MIME type: text/css
- ☐ CSS 1 ('96): early recognition of value
- ☐ CSS 2 ('98): improvements in language
  - ■ Adding media types (screen vs print)
  - ■ Inconsistent support by browsers
- ☐ CSS 2.1 ('11)
  - ■ In practice since '04
  - ■ Took forever to standardize
- ☐ CSS 3 (informal name)
  - ■ Breaks standard into many (50?) modules
  - ■ Modules developed, adopted independently
  - ■ https://www.w3.org/Style/CSS/current-work
  - ■ https://caniuse.com/?cats=CSS

Key Idea

- ☐ Separate content and style
  - ■ Different languages (syntax):HTML vs CSS
  - ■ Different documents
- ☐ Goal: Single-point-of-control-over-change
  - ■ Change font of every word in paragraph?
  - ■ Change font of every <em> element in document?
  - ■ Change font of every <em> element in every document on a site?
  - ■ Change font of every <em> element which is part of instructions, but not finalized, on site?

CSS Syntax

- ☐ CSS is *declarative* (not *procedural*)
  - ■ Describe a thing, not how to do compute it
  - ■ Example: RE matching
- ☐ CSS = list of *rules* (order can matter)
- ☐ Rule = a location & the style to use there
- ☐ Basic syntax of a rule

```
selector {
    property1: style1;
    property2: style2;
    . . .
}          /* comments always help */
```

Example CSS

```
h2 {
/* draconian OSU visual identity */
      color: darkred;
      background: gray;
/* additional gratuitous styling */
      font-style: italic;
}
```

Many Available Properties

- ☐ Background
    - `background-color, background-image`
- ☐ Text, font
    - `line-height, text-align, color`
    - `font-family, font-style, font-size`
- ☐ Border, margin, padding
    - `border-left-width, border-bottom-color`
- ☐ Positioning
    - `clear, display, float`
- ☐ Dimension
- ☐ List, table
    - `list-style-type`
    - `border-collapse, caption-side`
- ☐ Generated content and other fancy stuff
- ☐ See: developer.mozilla.org/Web/CSS/Reference

Shorthand Properties

- ☐ Example: Margins have 4 sides
  - `margin-top: 3px;`
  - `margin-right: 5px;`
  - `margin-bottom: 7px;`
  - `margin-left: 9px;`
- ☐ Shorthand property: margin
  - `margin: 3px 5px 7px 9px;` `/* TRBL */`
  - `margin: 7px 9px;` `/* TB sides */`
  - `margin: 2px 6px 8px;` `/* T sides B */`
- ☐ Mnemonic: always "TRouBLe"
  - ■ Missing values filled in with provided value(s)
- ☐ Other shorthand properties:
  - ■ Padding, border-width, font, border, background…

Including CSS: Mechanics

☐ Embed directly in element

```
<p style="color: red; background: gray">
```

☐ Place in style element in head

```
<head>
    <style media="screen">
      p {color: red; background: gray;}
    </style>
</head>
```

☐ Link to separate CSS file in head

```
<head>
    <link rel="stylesheet"
     href="3901Style.css" media="screen" />
<head>
```

Example CSS

```css
h2 {

    color: darkred;

    background: gray;

    font-style: italic;

}

em {

    font-style: normal;

    font-weight: bold;

}
```
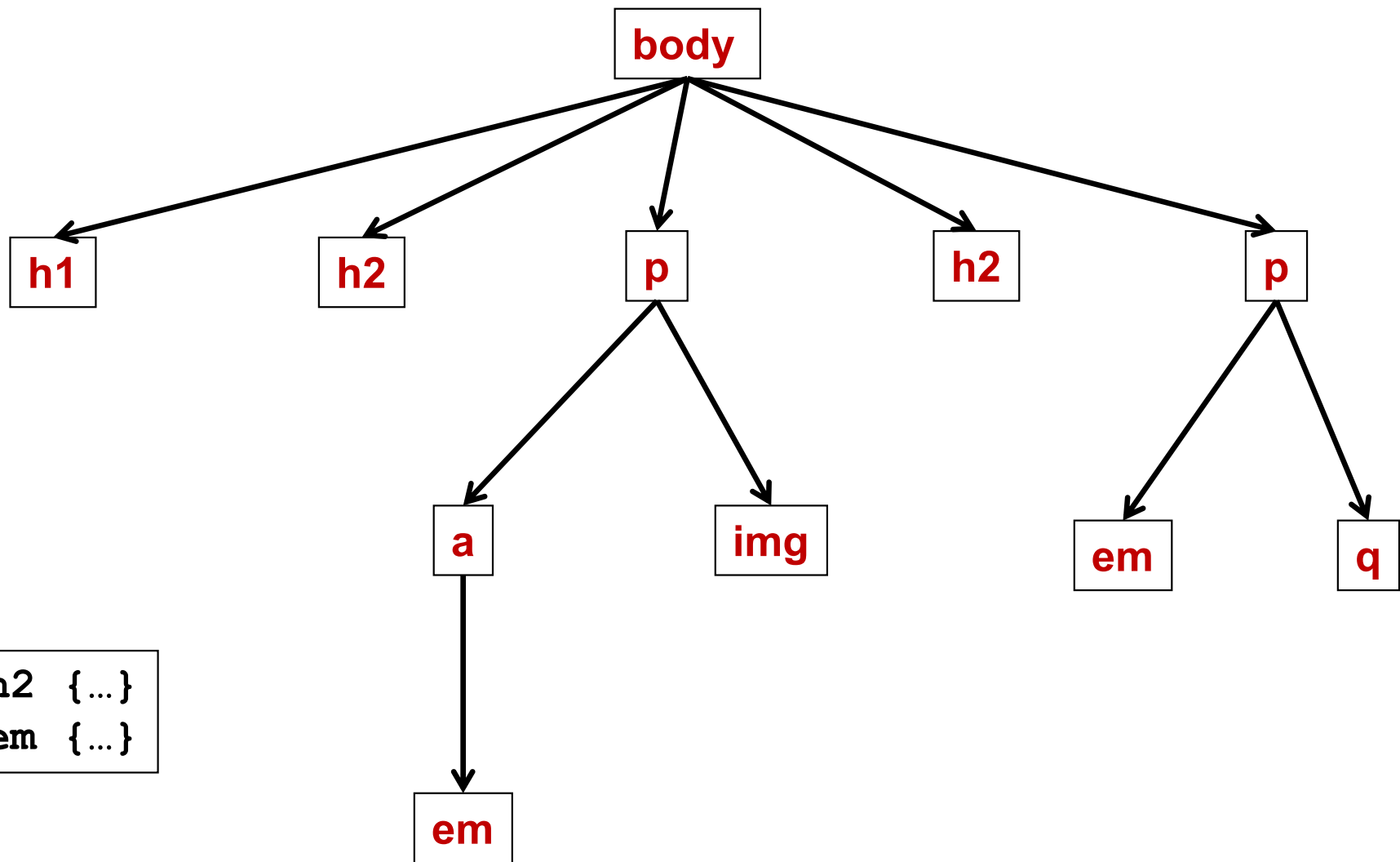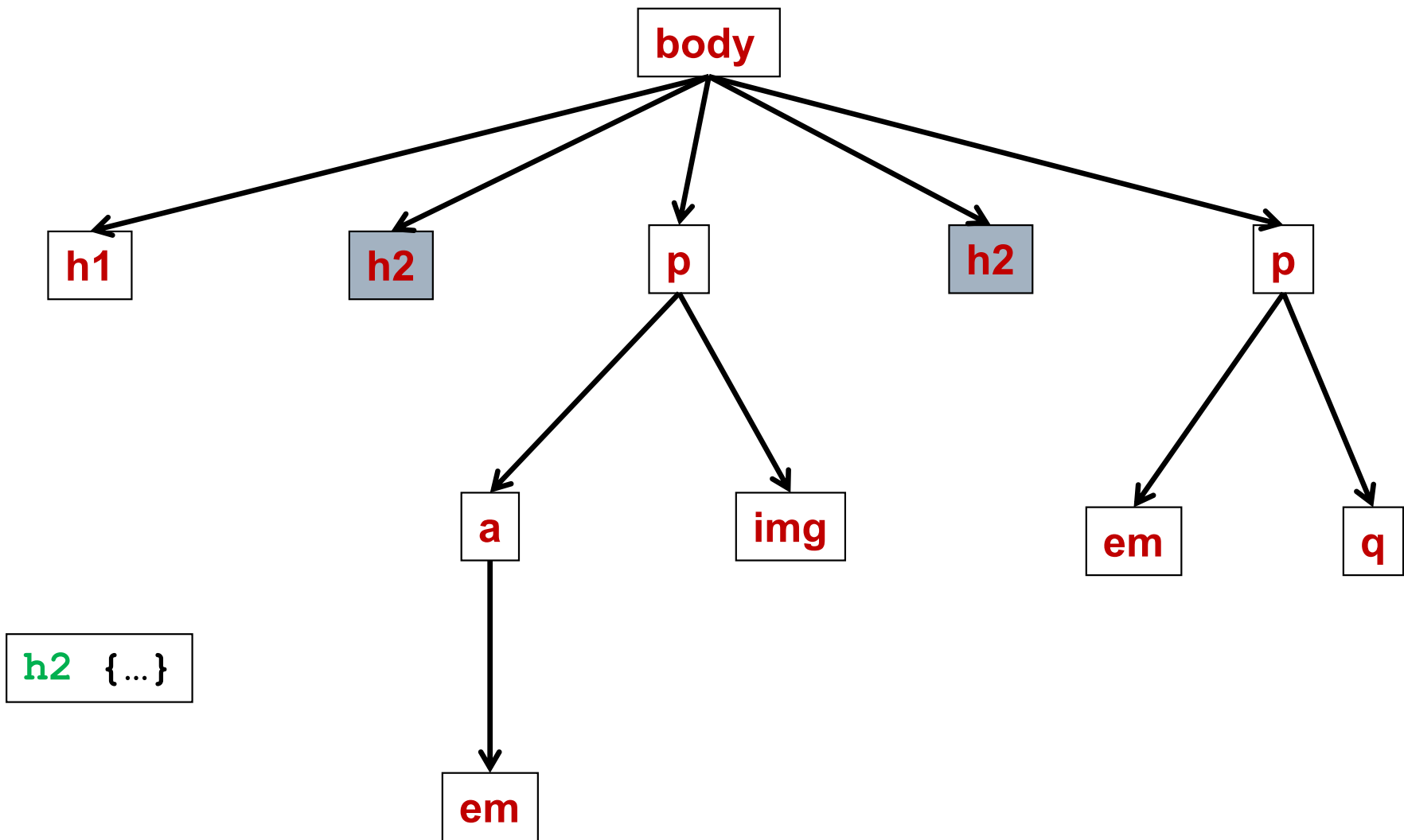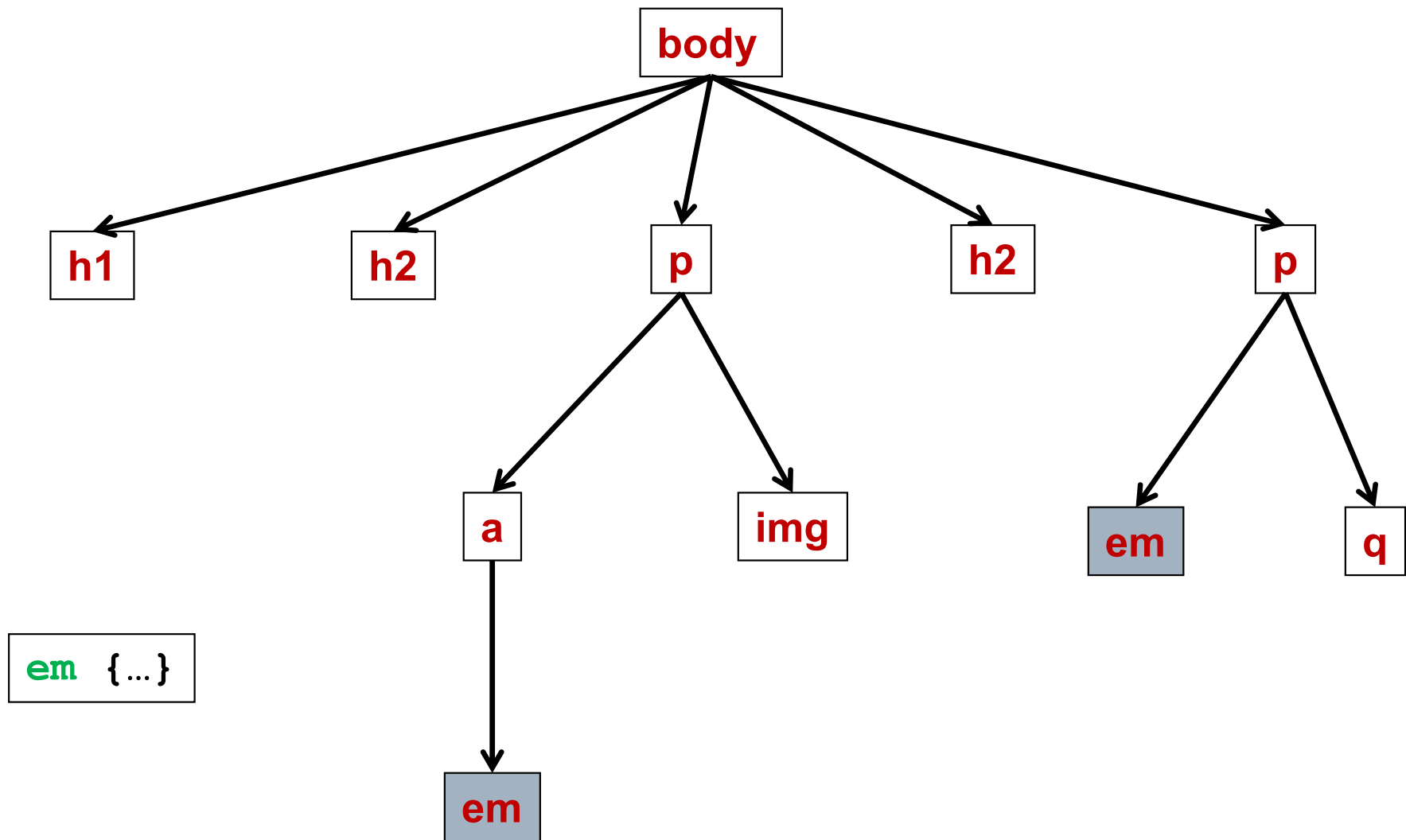
Tree (Rooted at Body)
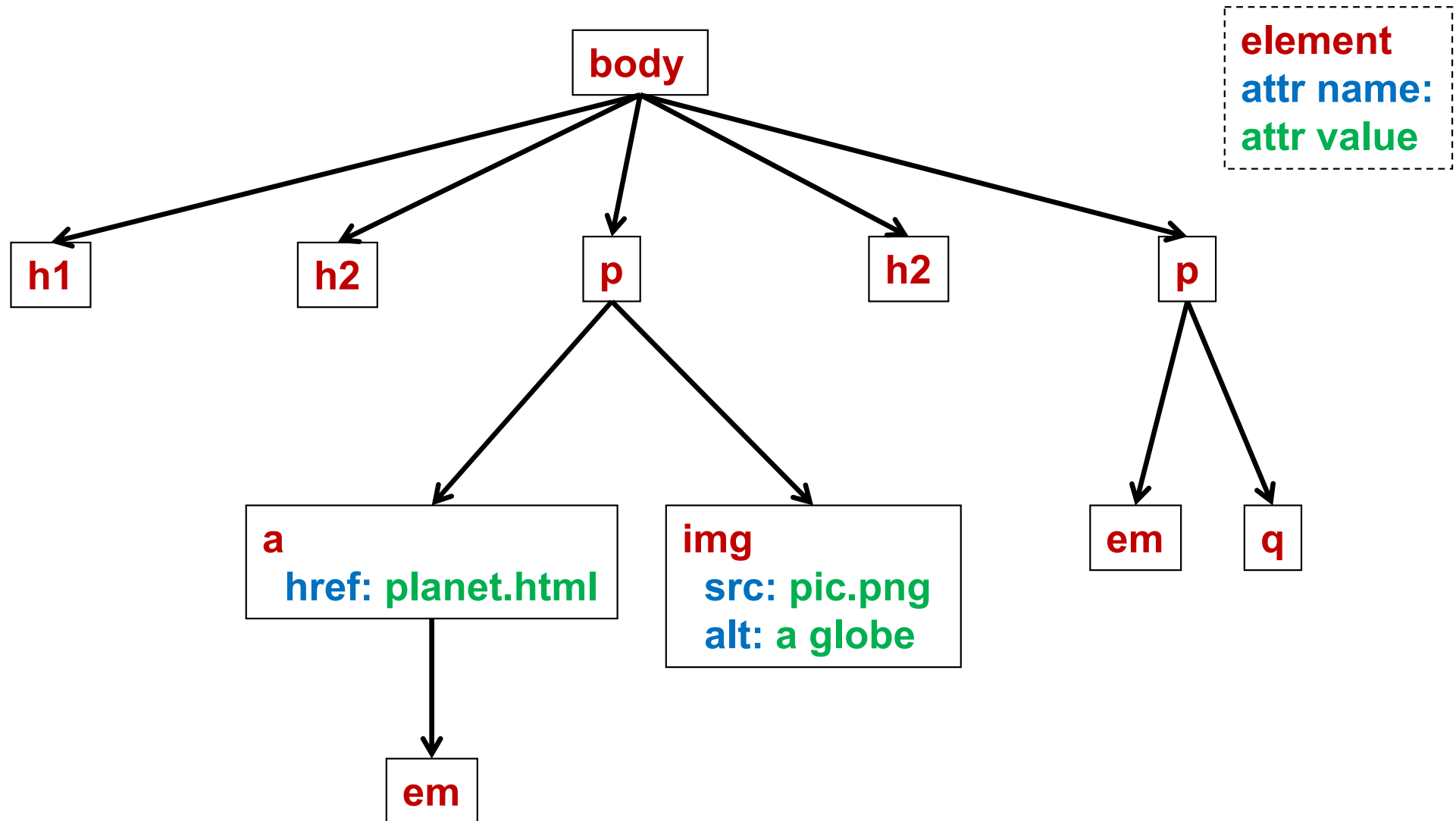
Tree (sans Attributes)
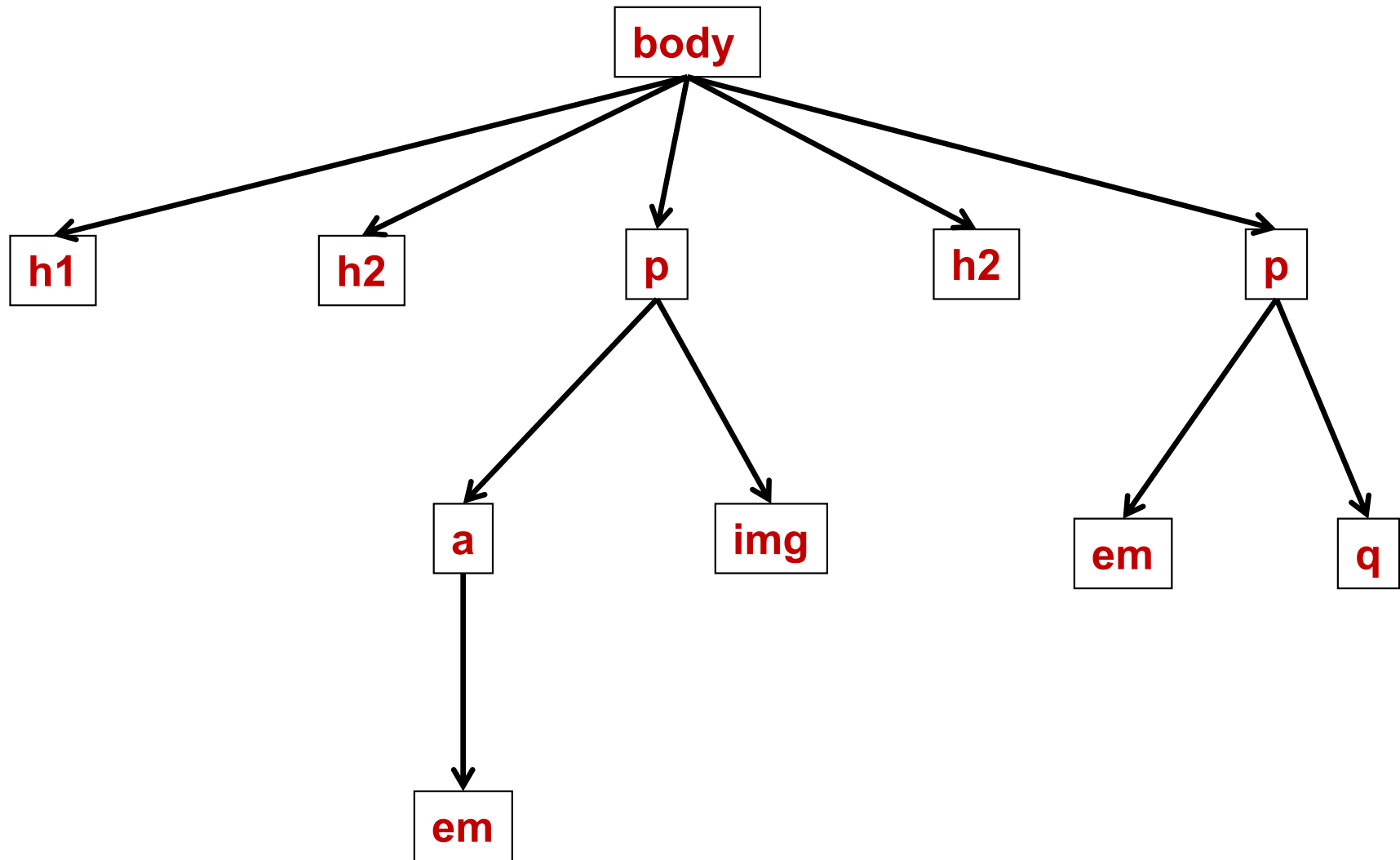
Tree (sans Attributes)

Selectors Applied to Tree

Selectors Applied to Tree

codepen.io/cse3901/pen/eVdMXR

Multiple Selectors

```
h1 {
      color: darkred;
      background: gray;
      font-style: italic;
      border-bottom-style: solid;
}
h2 {
      color: darkred;
      background: gray;
      font-style: italic;

}
```

Multiple Selectors: SPOCOC

```
h1, h2 {
        color: darkred;
        background: gray;
        font-style: italic;
}


h1 {
        border-bottom-style: solid;
}
```

codepen.io/cse3901/pen/eVdMXR

Inheritance for SPOCOC

- ☐ A child inherits many properties from parent by default
    - ■ Font weight, color, family, etc
    - ■ Can be overridden in child
- ☐ Set global styles in root

```
body {
    font-family: sans-serif;
}
```
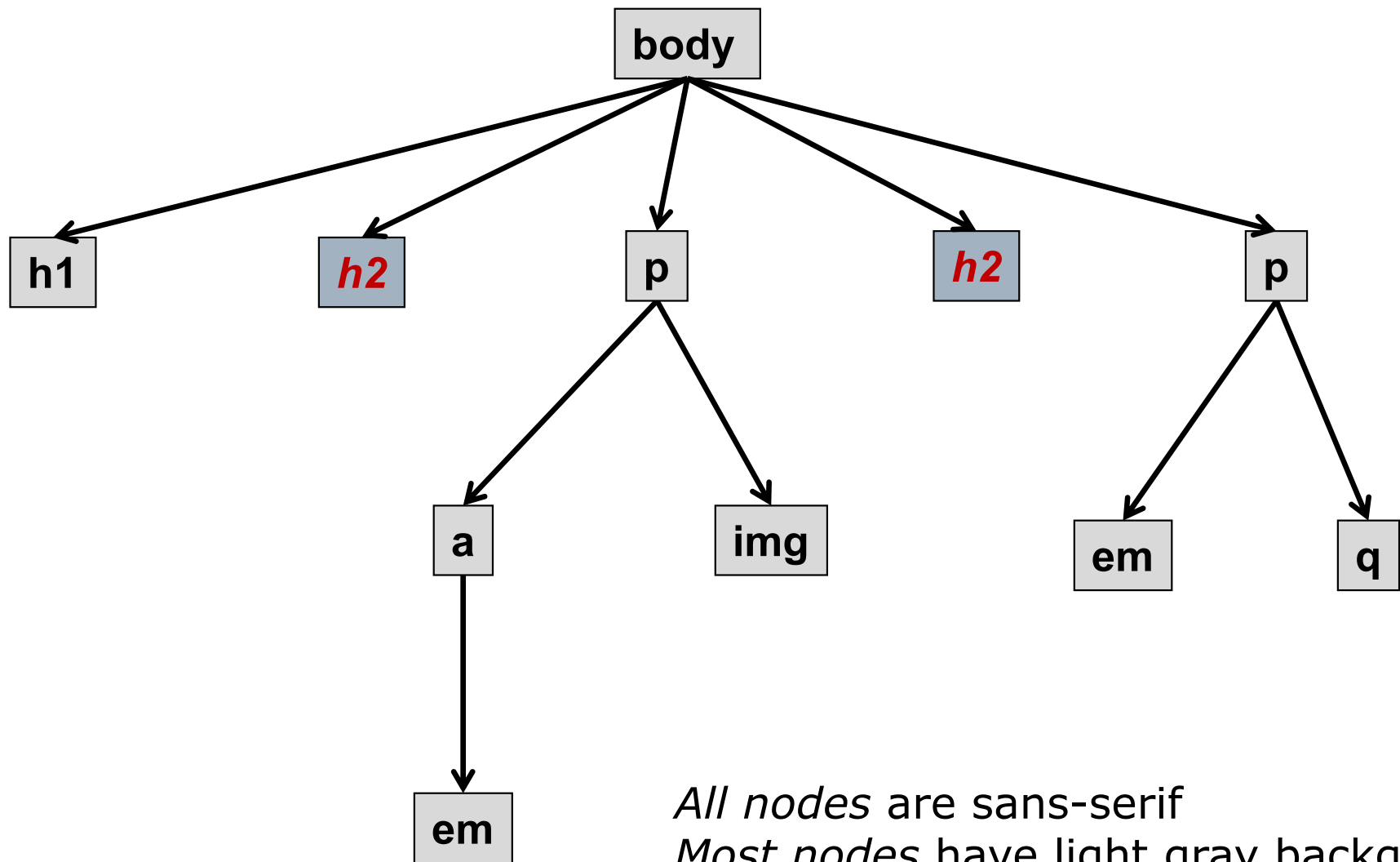
   - ■ Contrast this with having to set property in all possible elements!
- ☐ Generally, text properties (eg color) are inherited, box-related (eg border) are not
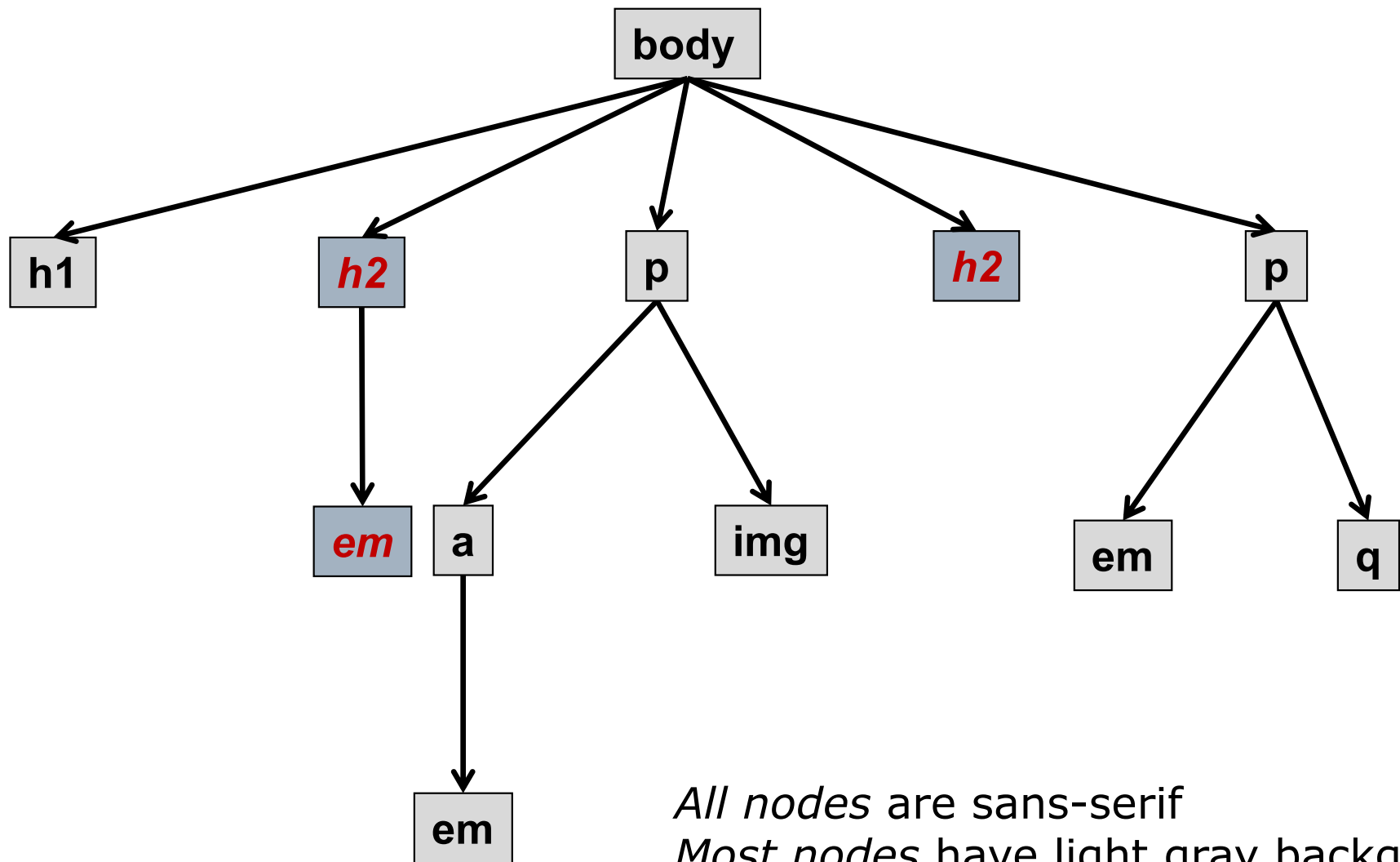
Example Inheritance

```css
body {
   font-family: sans-serif;
   background: lightgray;
}


h2 {
   /* inherits font-family, backgrd */
   color: darkred;
   background: gray; /* new backgrd */
   font-style: italic;
}
```
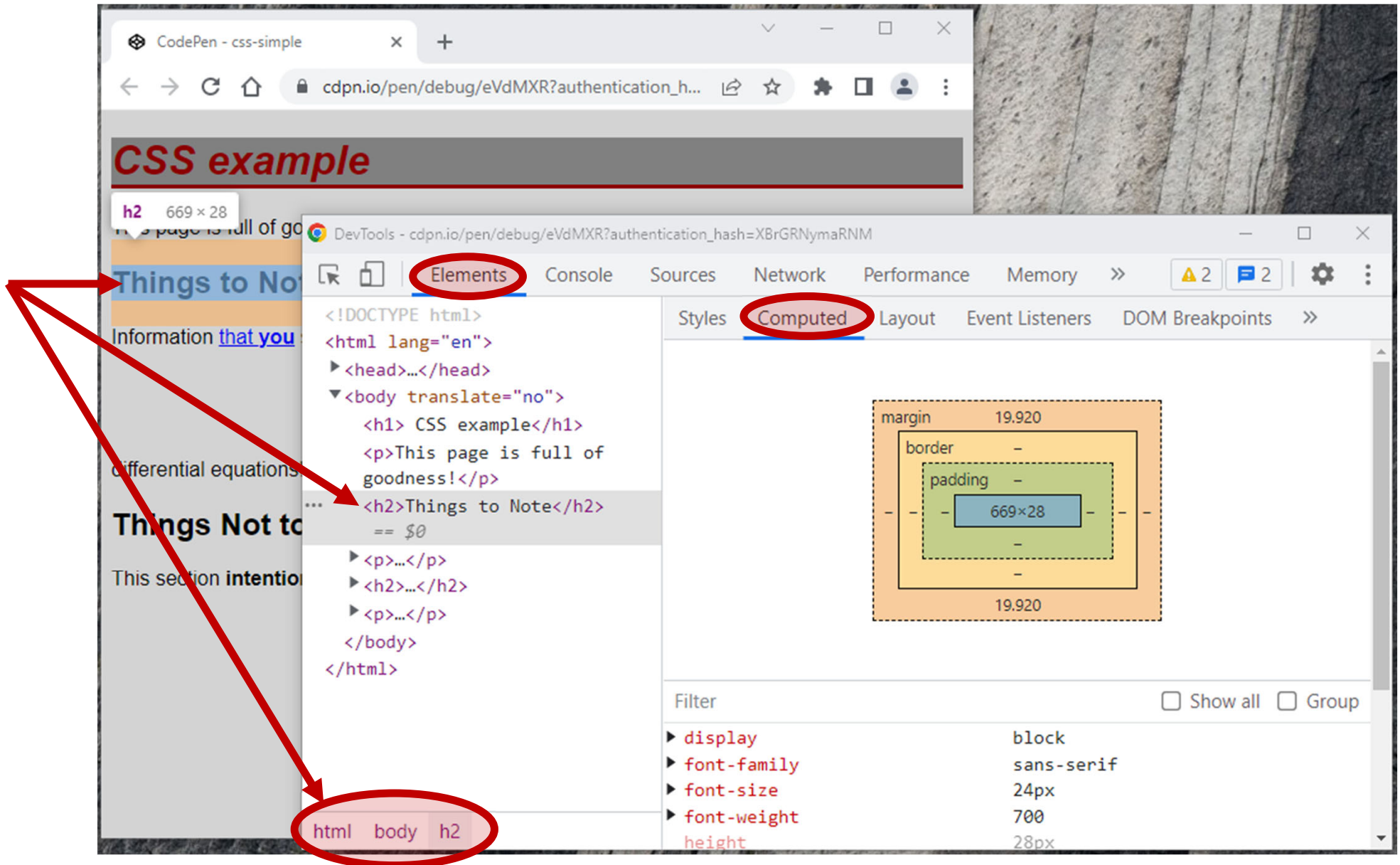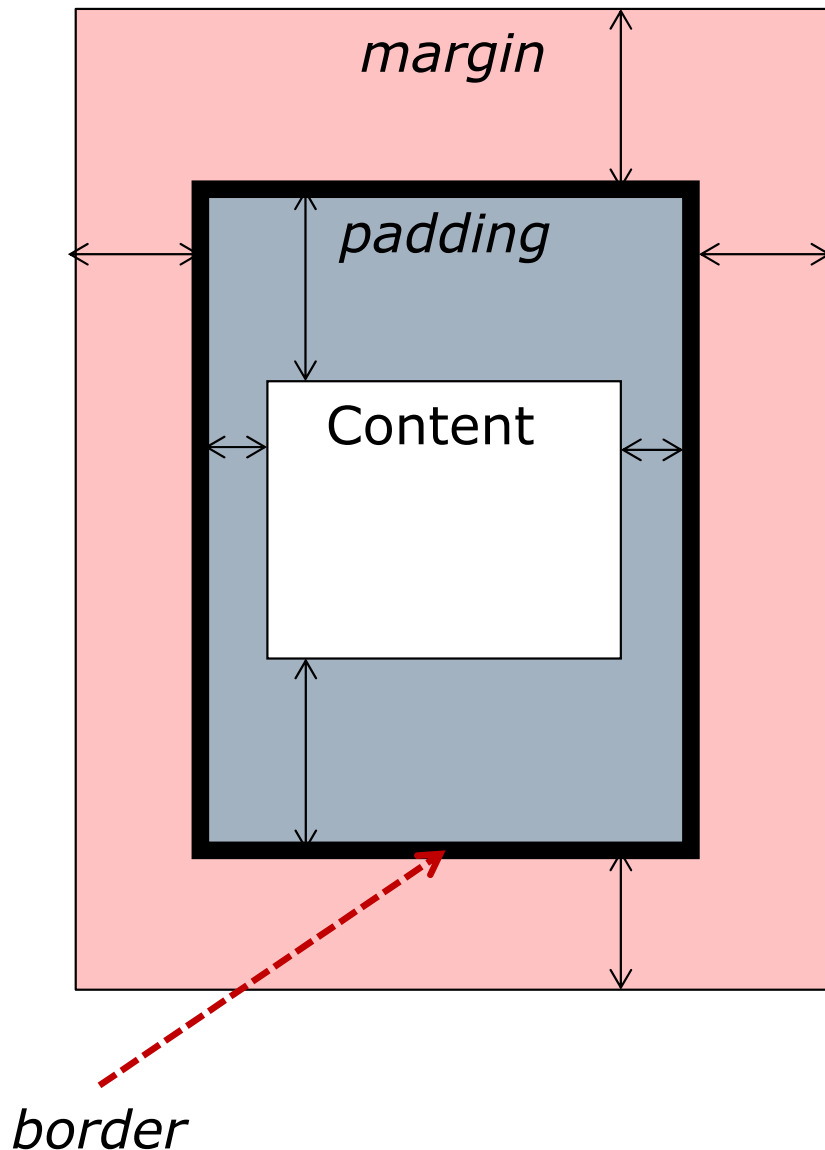
Inherited Properties

All nodes are sans-serif
Most nodes have light gray background

codepen.io/cse3901/pen/eVdMXR

Inherited Properties

All nodes are sans-serif
Most nodes have light gray background

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Demo: Chrome Dev. Tools

Layout: The Box Model
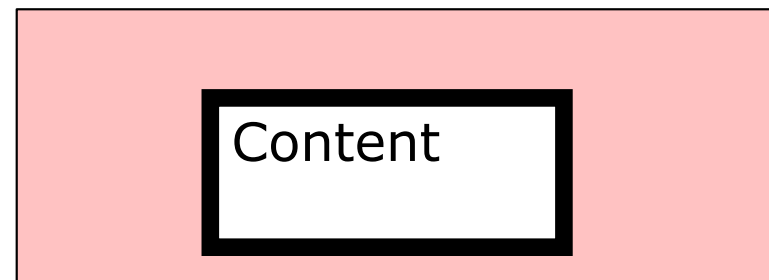
margin

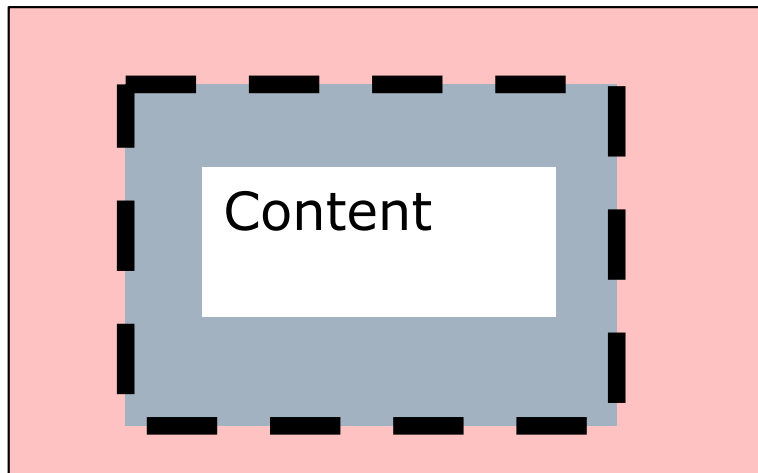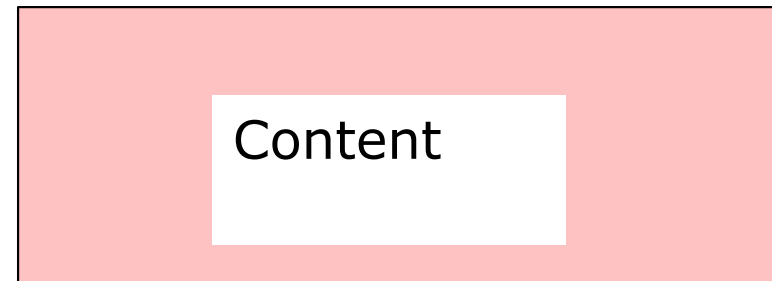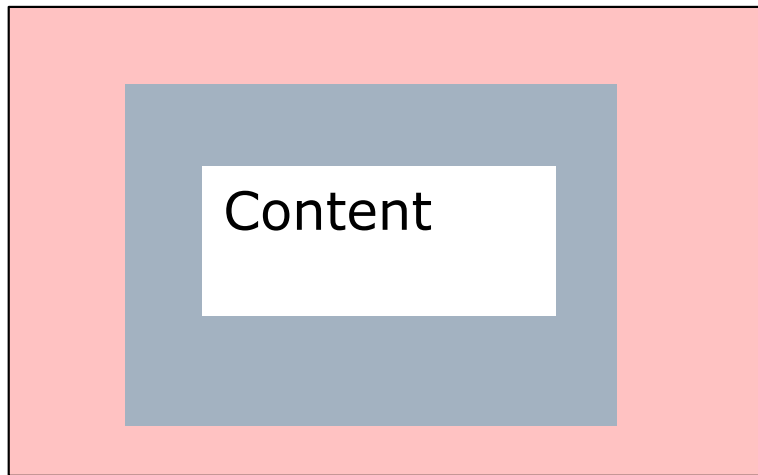*padding*

Content

border

- ☐ **Both block & inline**
  - ■ Minor differences
- ☐ **Border appearance**
  - ■ Style, width, color, radius
- ☐ **Margins & padding**
  - ■ Transparent
  - ■ 4 independent sides
- ☐ **Padding is *part* of it**
  - ■ *Content* background shows through
- ☐ **Margins gives space**
  - ■ Some adjacent margins "collapse"

The Box Model As Layers

http://geek.focalcurve.com/crashcourse-part2/

Examples

Content

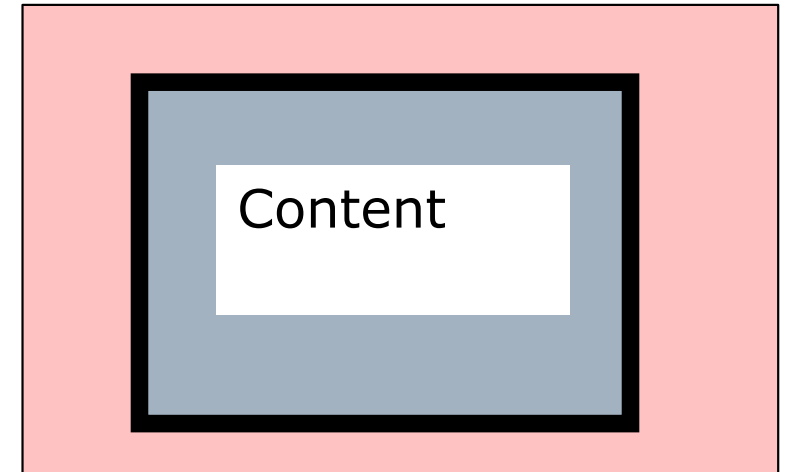Content

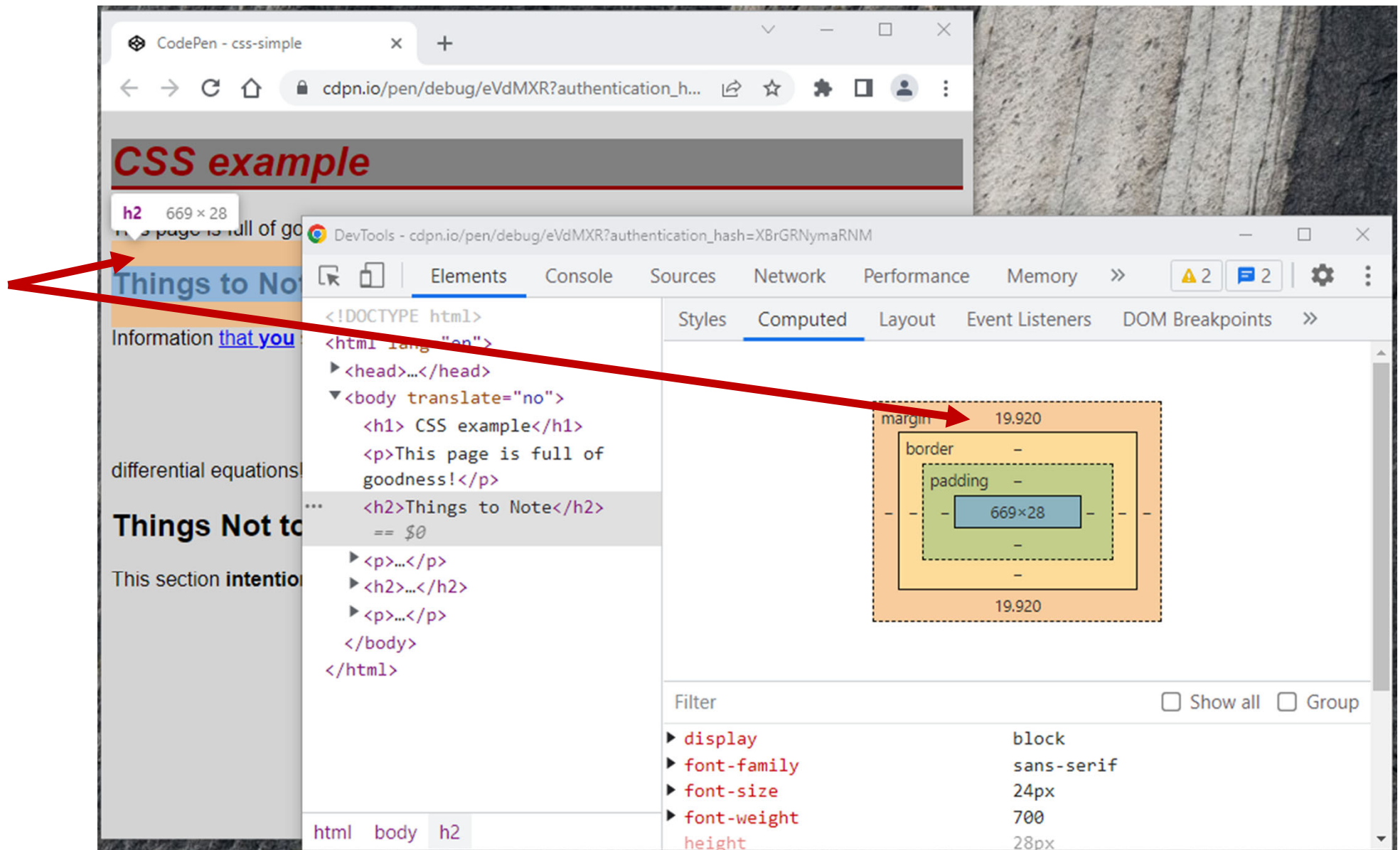Content
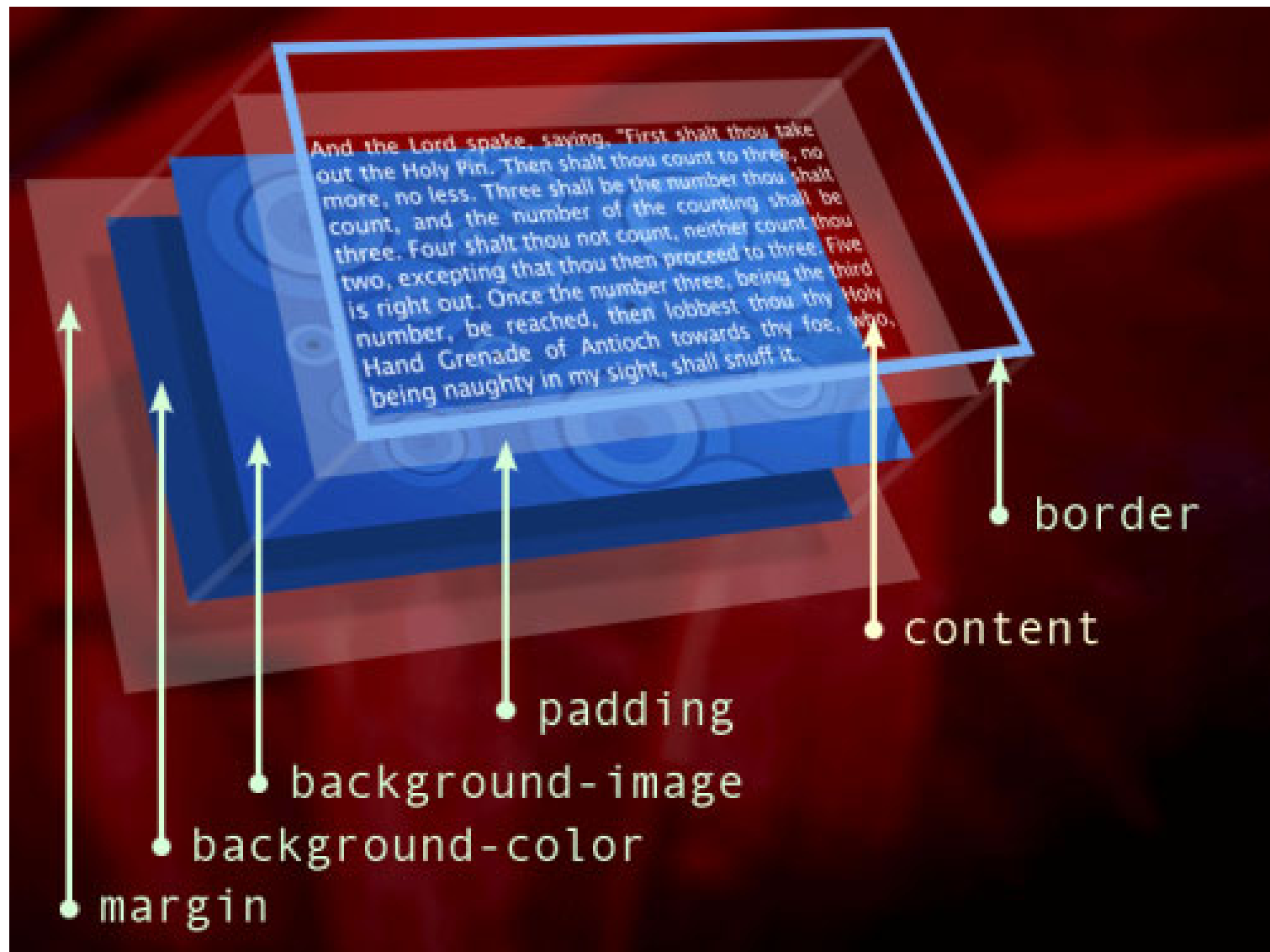
Content

Content

Content

Box Sizing

```
p {
    margin:   10px 100px 10px 10px;
    border-width: 5px 1px 5px;
    width:     200px;
    padding: 2px;
}
```

☐ Total width = ?

☐ CSS3 adds box-sizing

- ■ content-box (width sizes content only)
- ■ border-box (width includes border & padding)

Collapsing Vertical Margins

Content1

Content2

Content1

Content2

div   div

Collapsing Nested Margins

Preventing Margin Collapse

padding: 1px

Content

Content

Content

div

div

Demo: Chrome Dev. Tools

Inheritance and Box Sizing

- ☐ Property inheritance:
  - ■ Text properties (eg color) are inherited
  - ■ Box-related (eg border) are not
- ☐ Box sizing of (content) *width*: top-down
  - ■ Set by parent, child "fits" inside
  - ■ Relative, absolute
- ☐ Box sizing of (content) *height*: bottom-up
  - ■ Set by child, parent "fits" around
  - ■ Relative, absolute
- ☐ Parent and child's (vertical) margins collapse (if they touch)

Summary

- ☐ CSS separates style from structure
  - ■ Syntax: Rules with selectors, properties
  - ■ Link to CSS file from HTML document
- ☐ Selectors for picking elements in tree
- ☐ Box Model
  - ■ Content, padding, border, margin
  - ■ Margins can collapse when overlapping
- ☐ Inheritance
  - ■ Parent passes (font) properties to child
  - ■ Box-related properties aren't inherited