

CSS: Cascading Style Sheets

Lecture 17

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 `` element in document?
 - Change font of every `` element in every document on a site?
 - Change font of every `` 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"
```

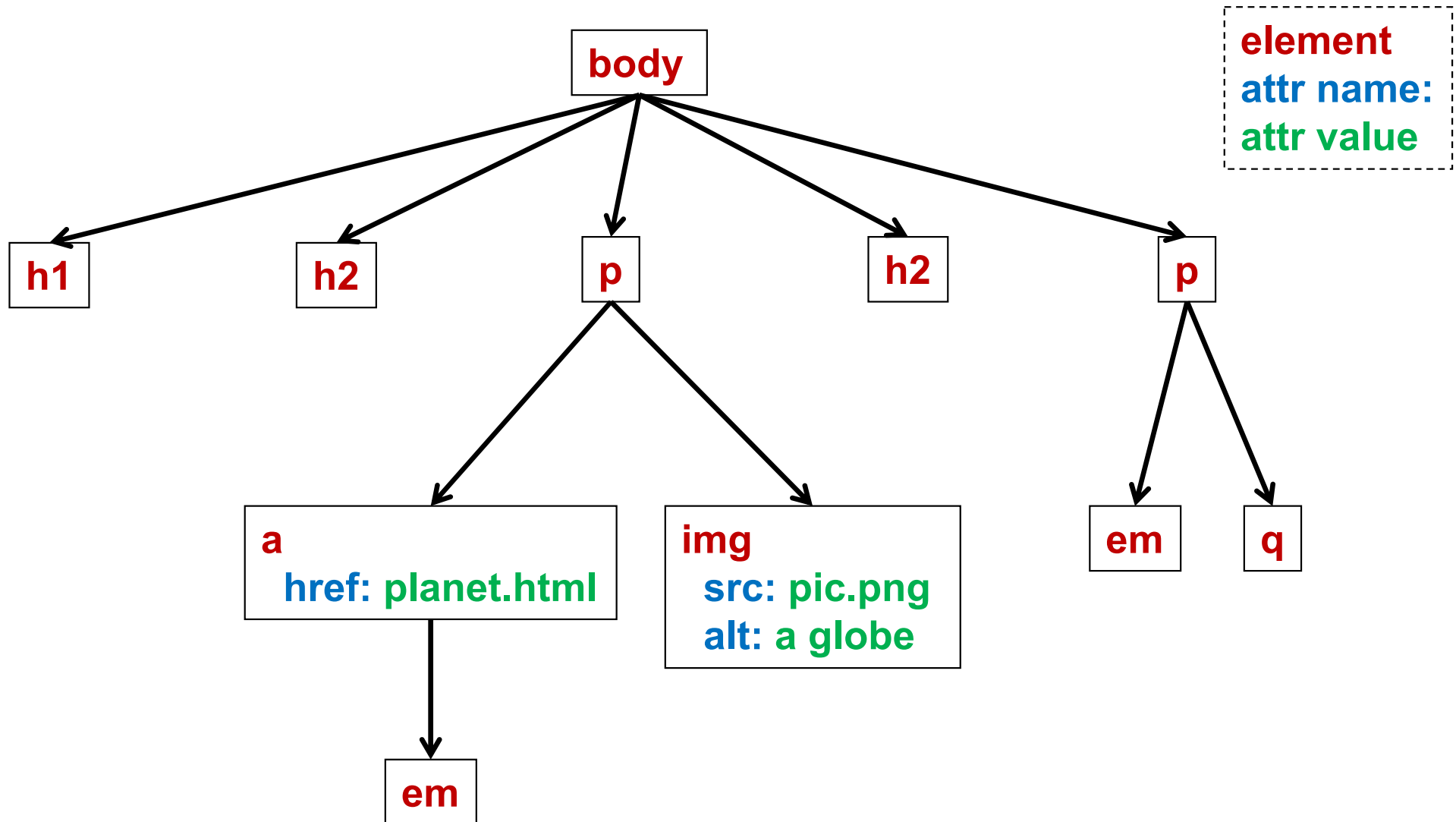
```
    href="3901Style.css" media="screen" />
```

```
</head>
```

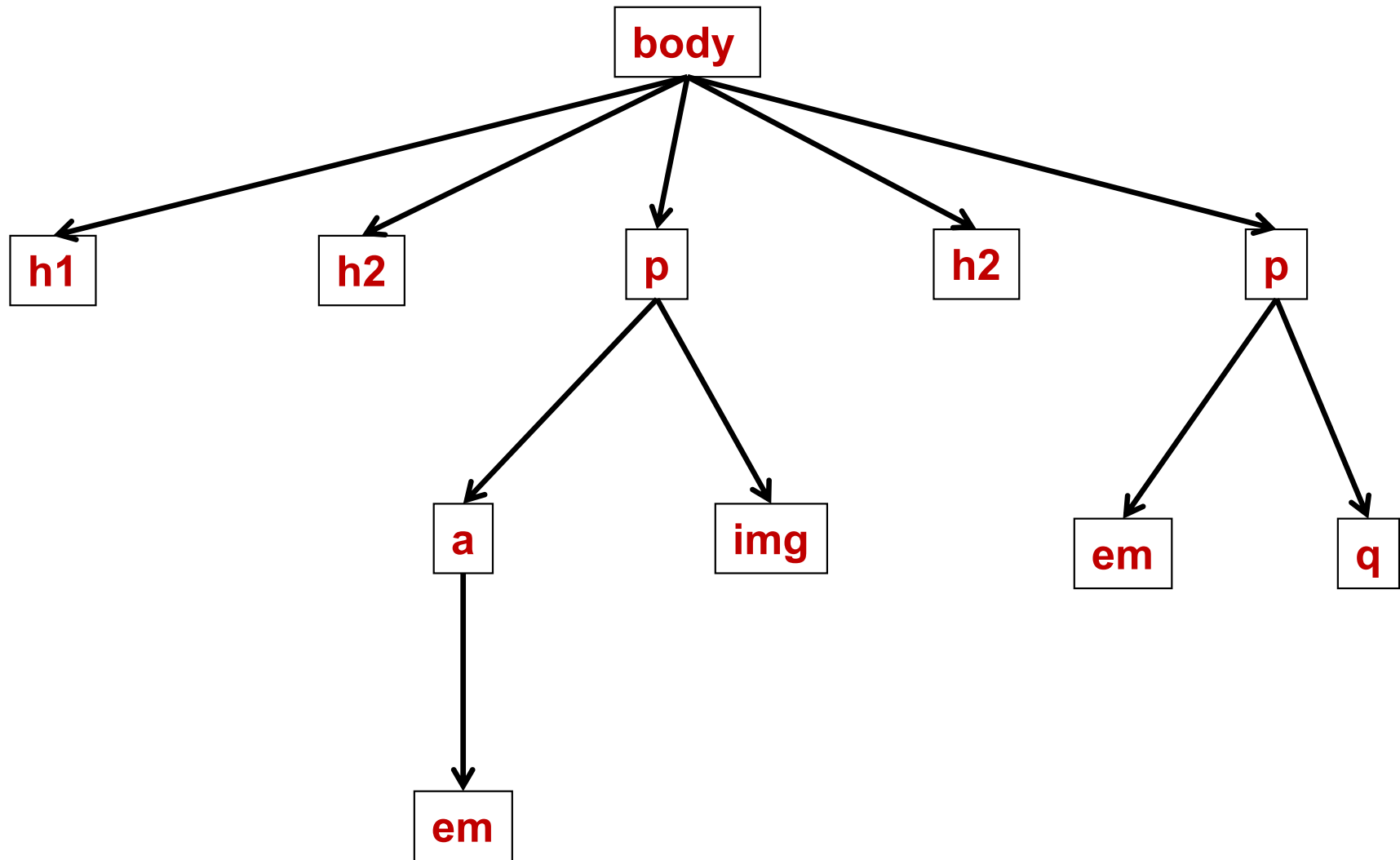

Example CSS

```
h2 {  
    color: darkred;  
    background: gray;  
    font-style: italic;  
}  
  
em {  
    font-style: normal;  
    font-weight: bold;  
}
```

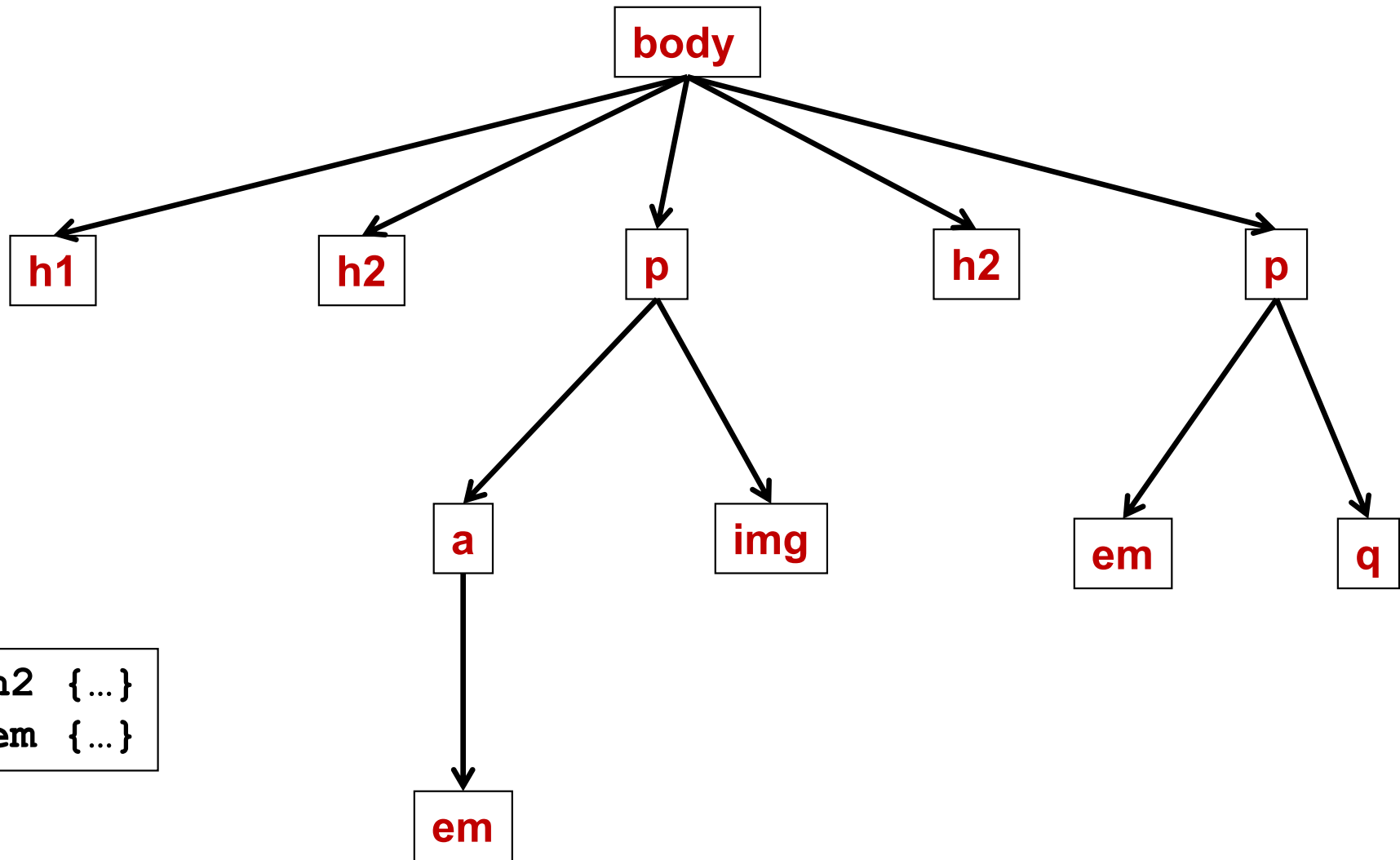
Tree (Rooted at Body)



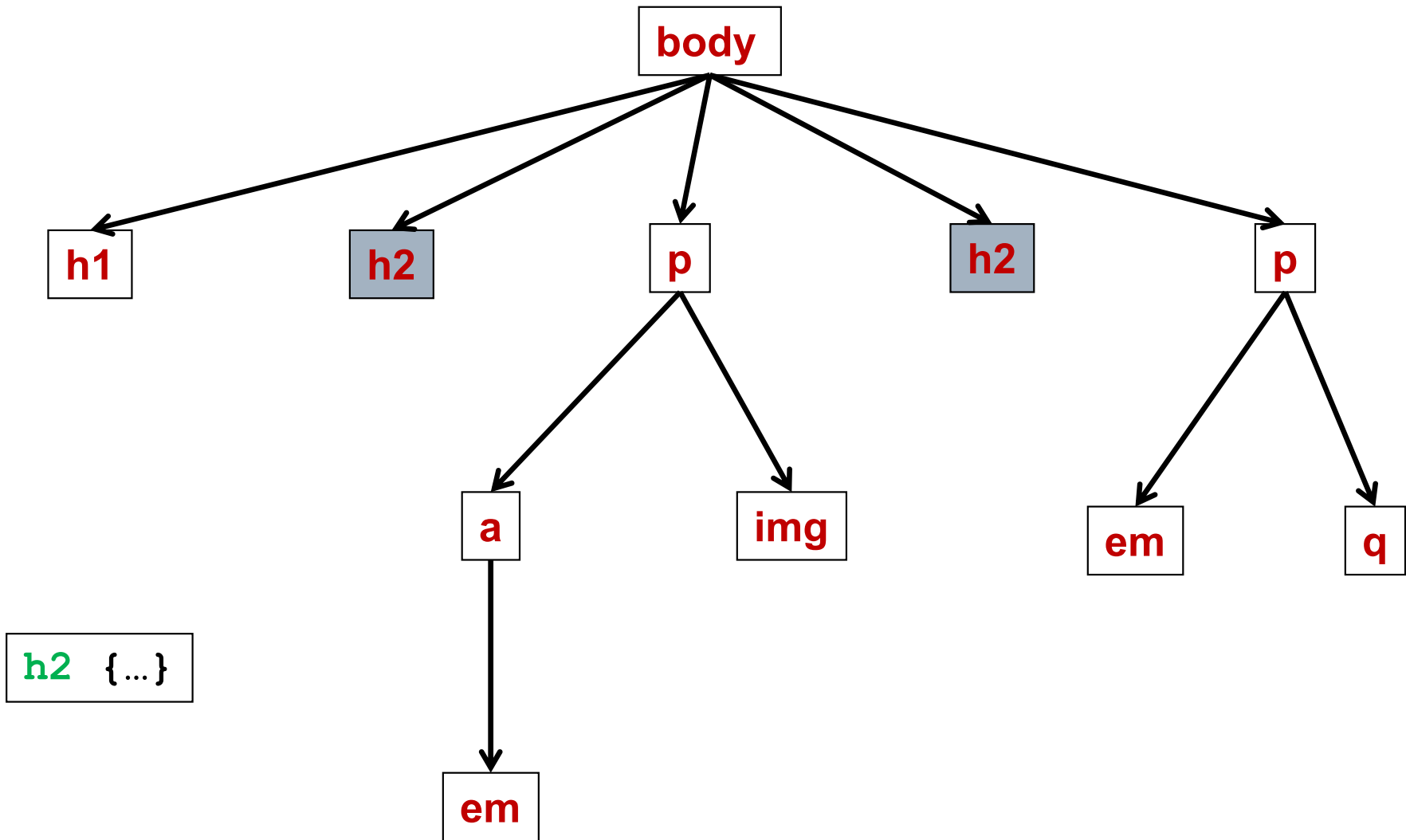
Tree (sans Attributes)



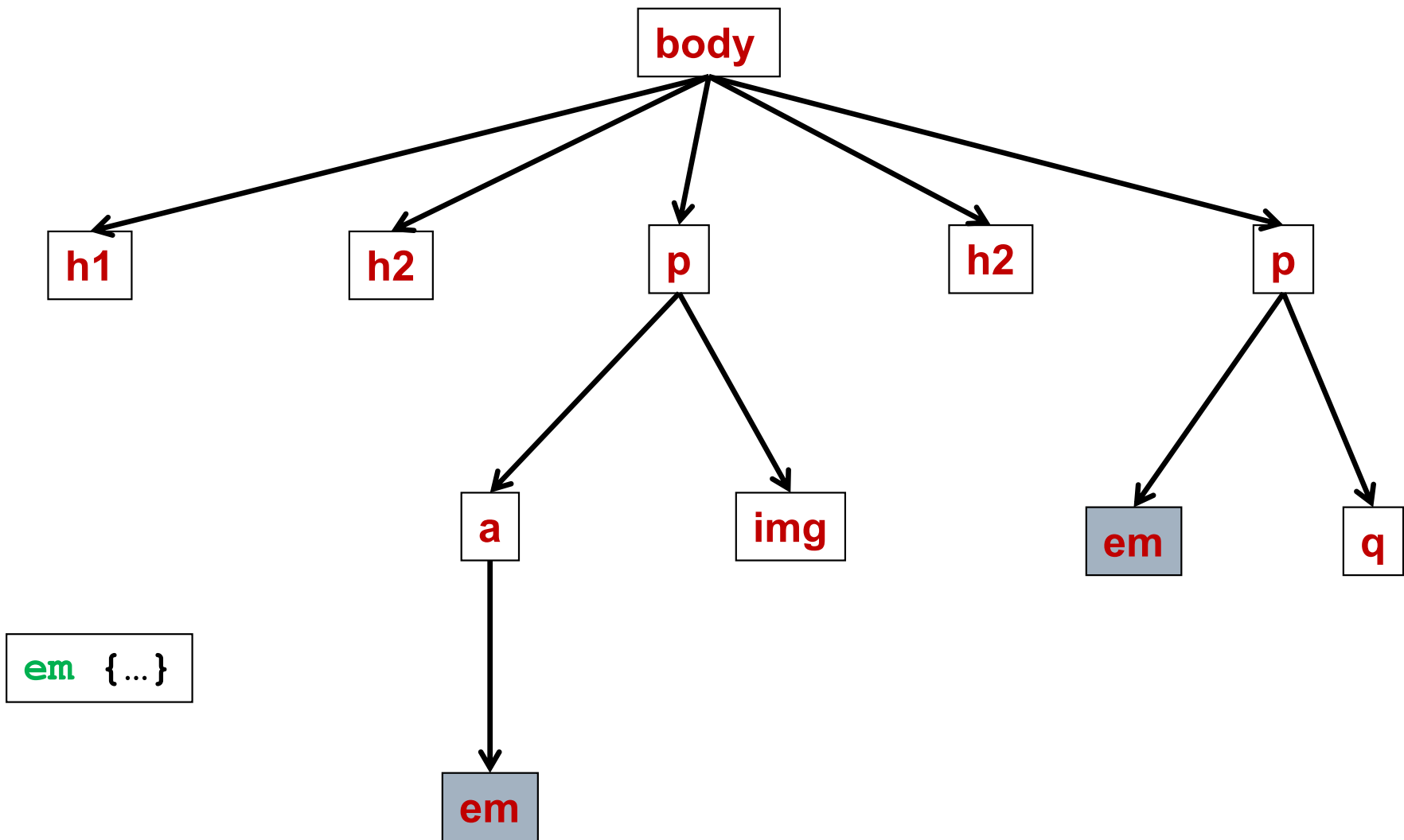
Tree (sans Attributes)



Selectors Applied to Tree



Selectors Applied to Tree



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;  
}
```


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;  
}
```

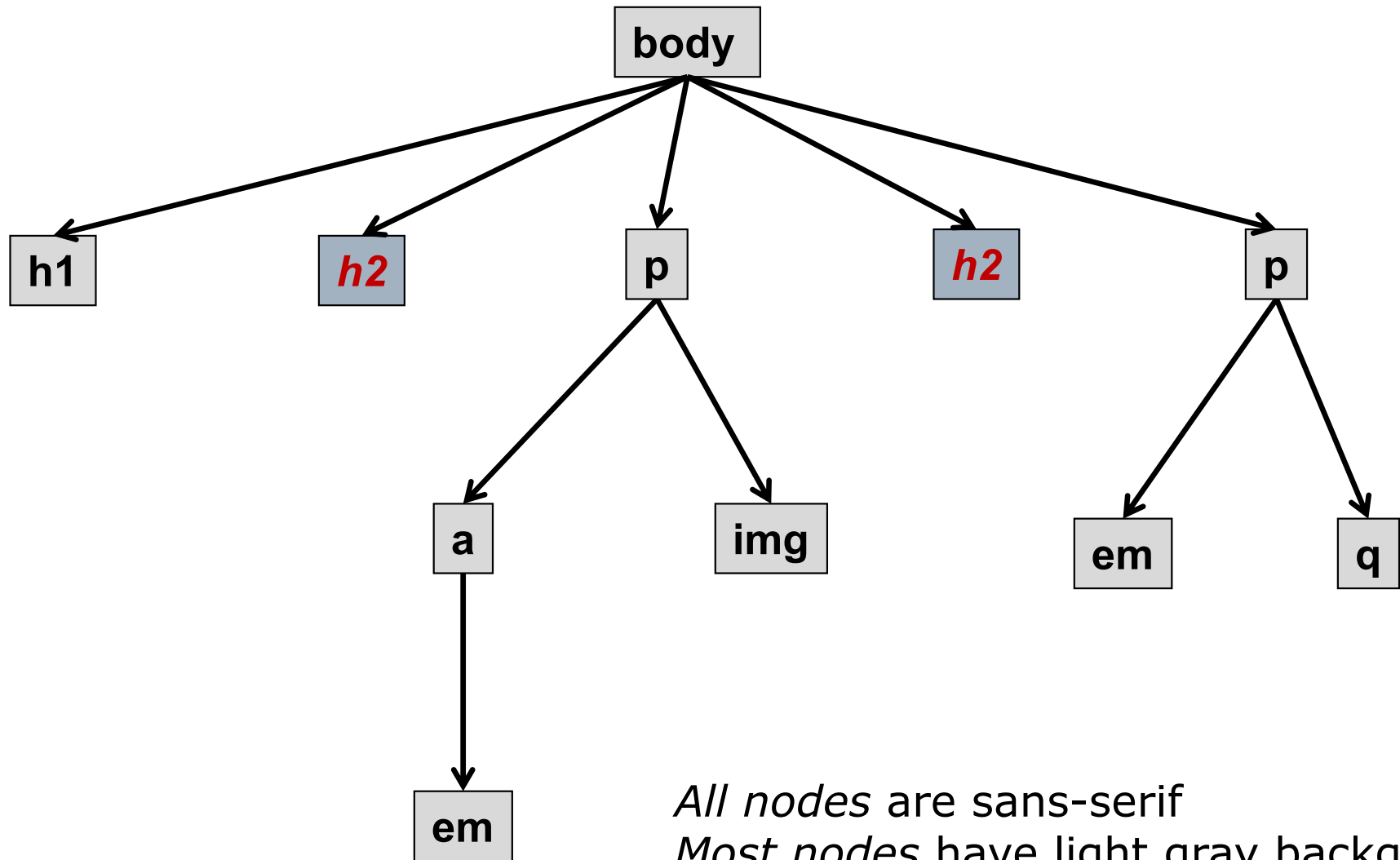
 - Contrast this with having to set property in all possible elements!
- Generally, text properties (eg color) are inherited, box-related (eg border) are not

Example Inheritance

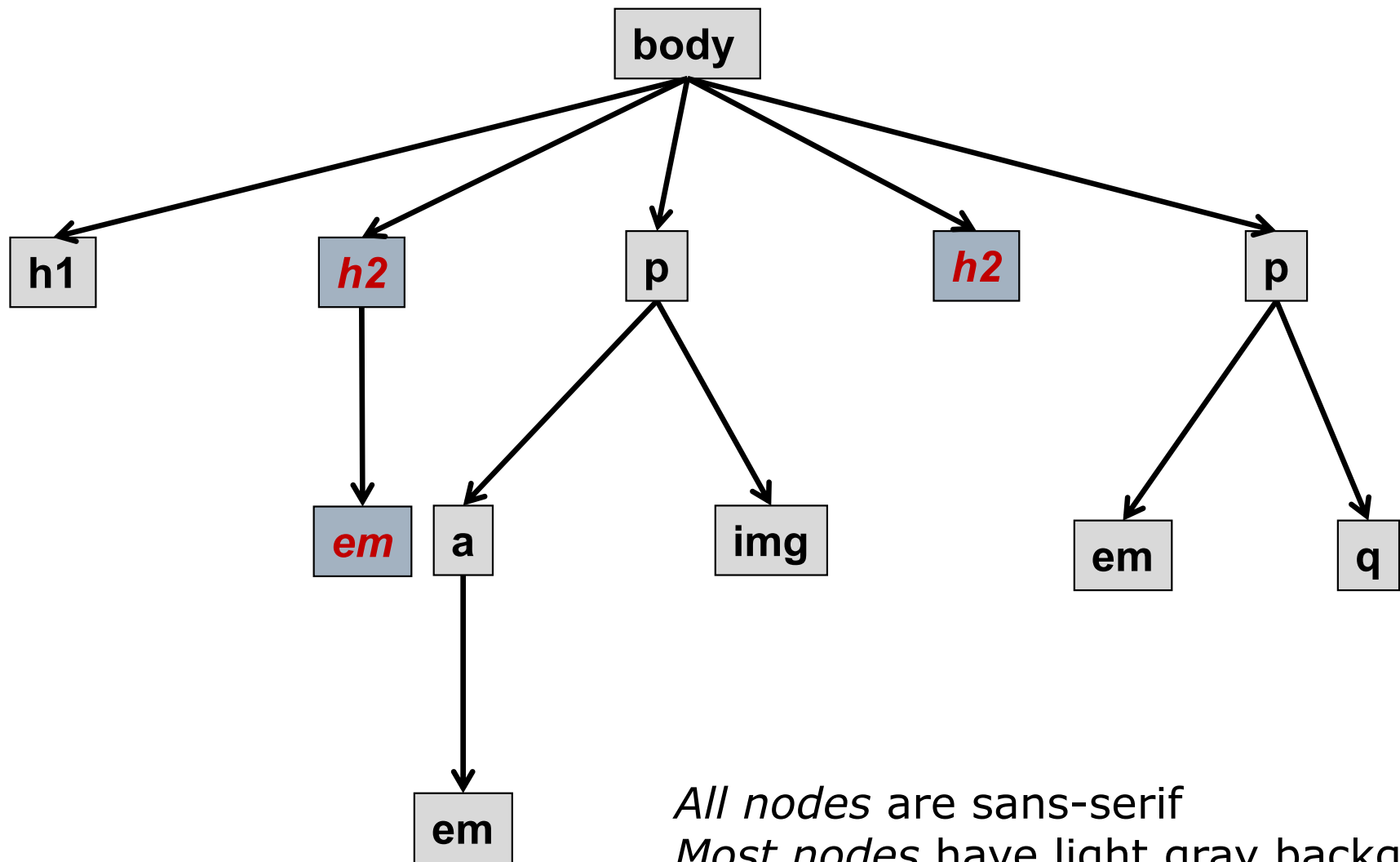
```
body {  
    font-family: sans-serif;  
    background: lightgray;  
}
```

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

Inherited Properties



Inherited Properties



Demo: Chrome Dev. Tools

The image shows a browser window displaying a page titled "CSS example" with a red header. The page content includes a blue header "Things to Note" and a paragraph "This page is full of goodness!". The Chrome DevTools interface is open, showing the "Elements" panel on the left and the "Computed" panel on the right. The "Elements" panel shows the DOM tree with the following structure:

```
<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body translate="no">
    <h1> CSS example</h1>
    <p>This page is full of goodness!</p>
    <h2>Things to Note</h2>
    <p>...</p>
    <p>...</p>
  </body>
</html>
```

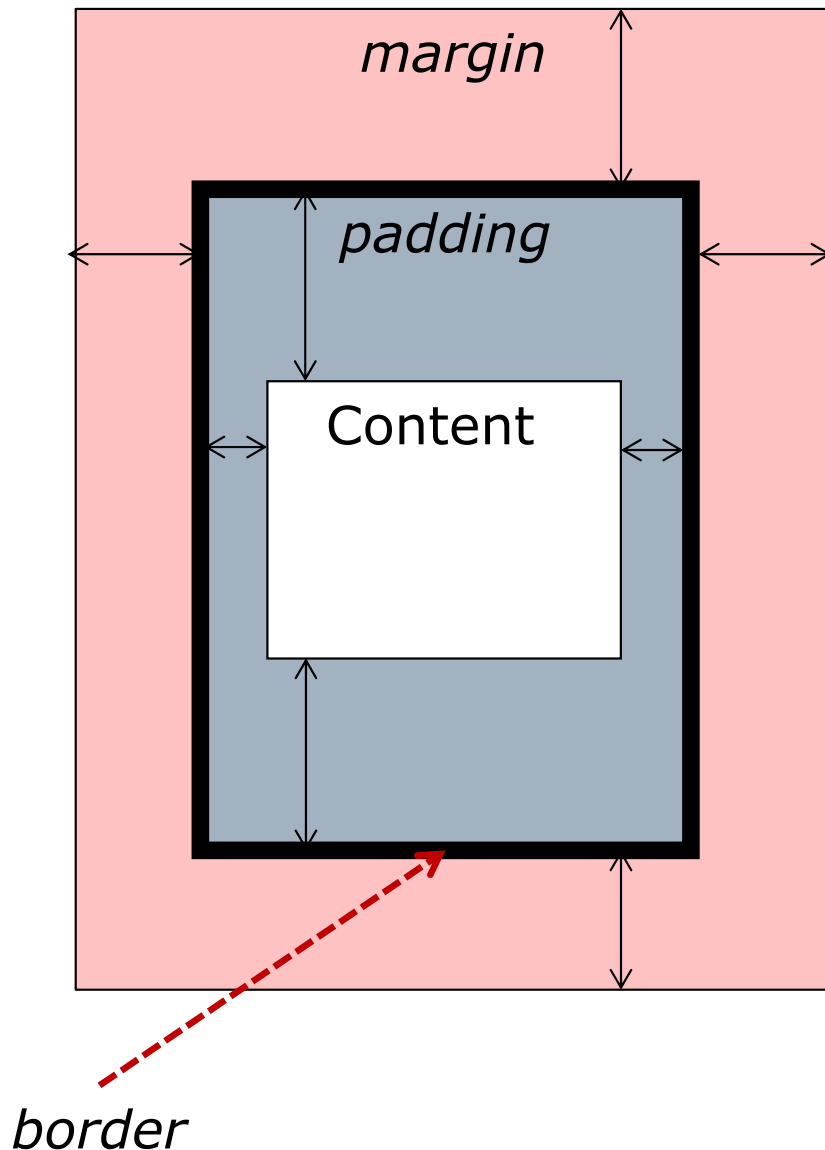
The "Computed" panel shows the following styles for the selected h2 element:

Property	Value
display	block
font-family	sans-serif
font-size	24px
font-weight	700
height	28px

Red arrows point from the "h2" element in the DOM tree to the "h2" element in the browser window and to the "html", "body", and "h2" breadcrumb in the Elements panel. The "Computed" panel also shows a box model diagram with the following values:

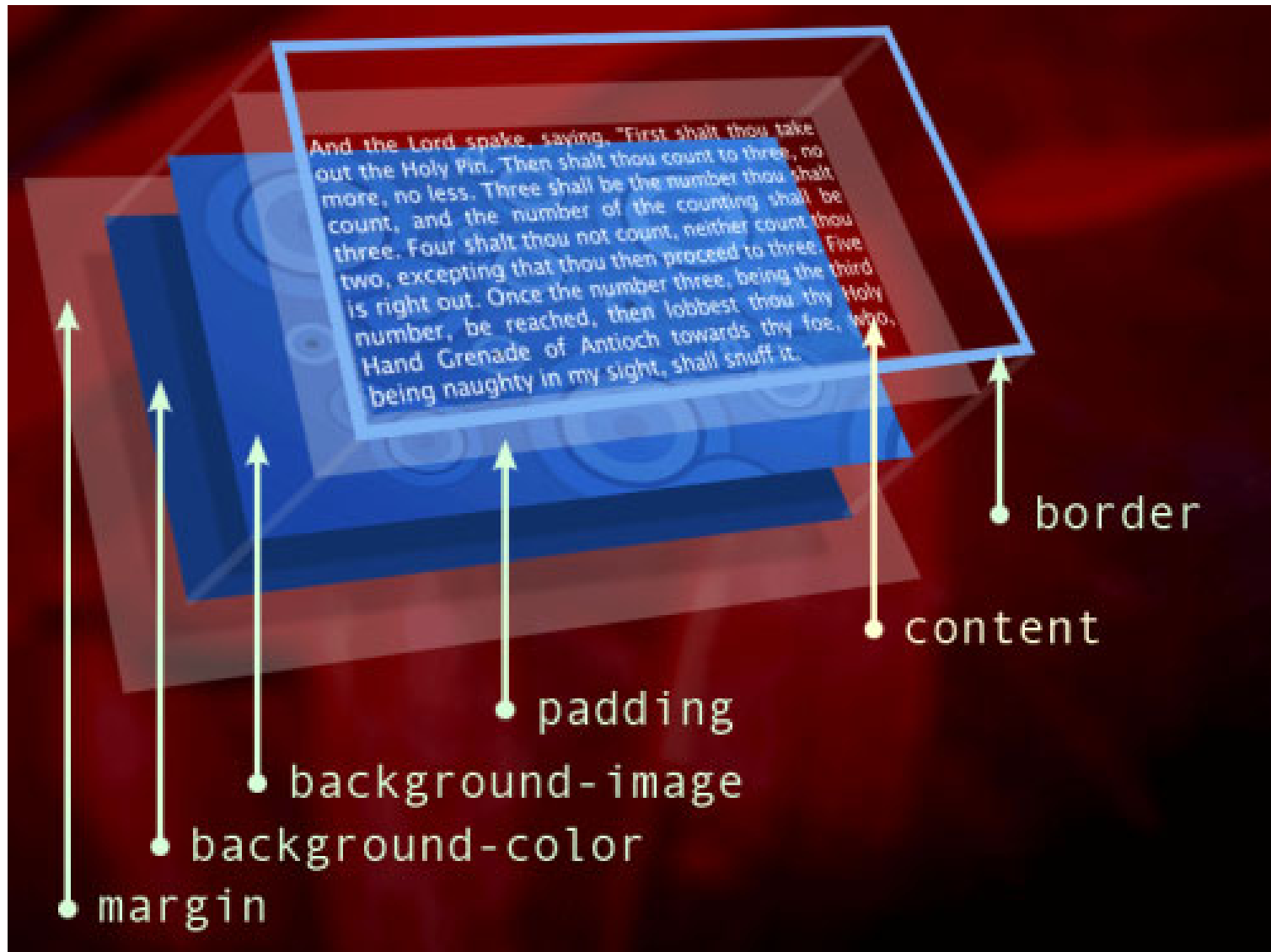
- margin: 19.920
- border: -
- padding: -
- 669x28 (content size)
- 19.920 (total height)

Layout: The Box Model

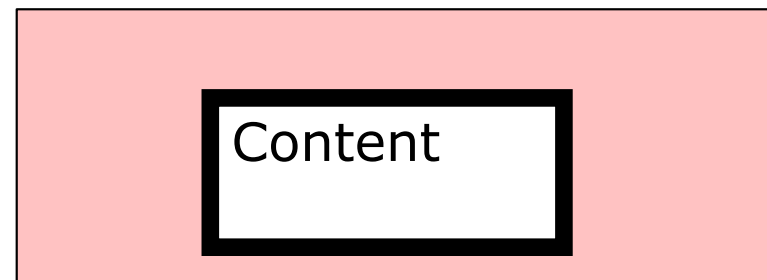
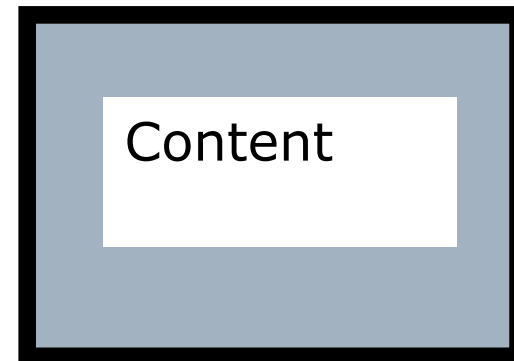
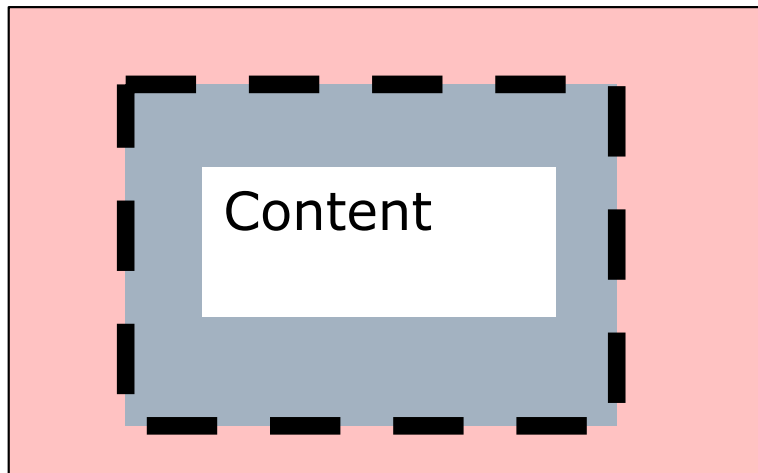
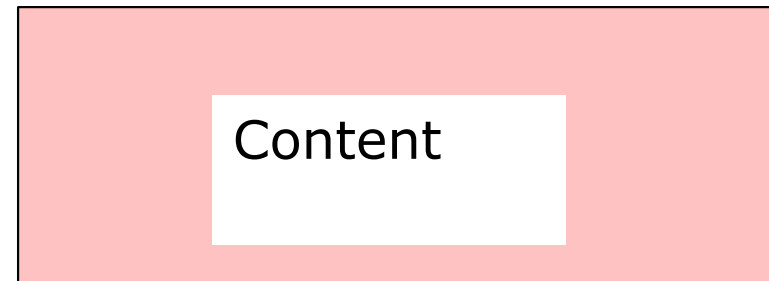
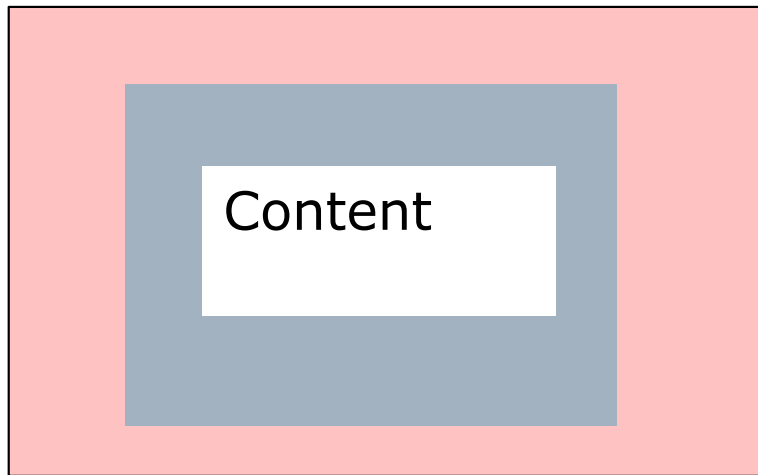


- Both block & inline
 - Minor differences
- Border appearance
 - Style, width, color, radius
- Margins & padding
 - Transparent
 - 4 independent sides
- Padding is *part* of it
 - *Content* background shows through
- Margins gives space
 - Some adjacent margins "collapse"

The Box Model As Layers

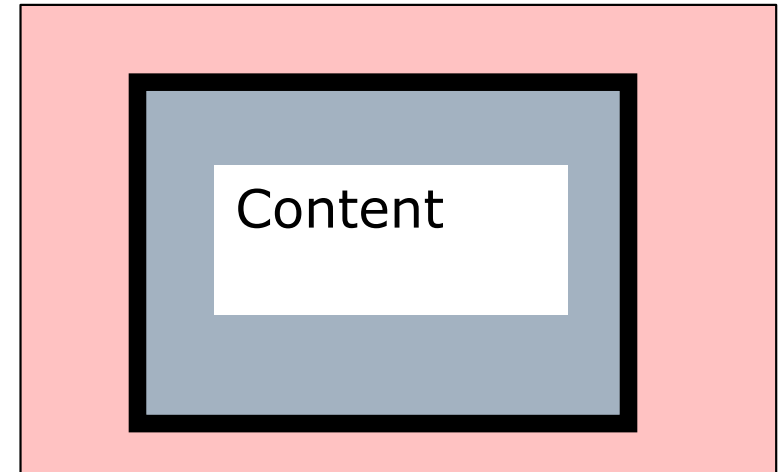


Examples



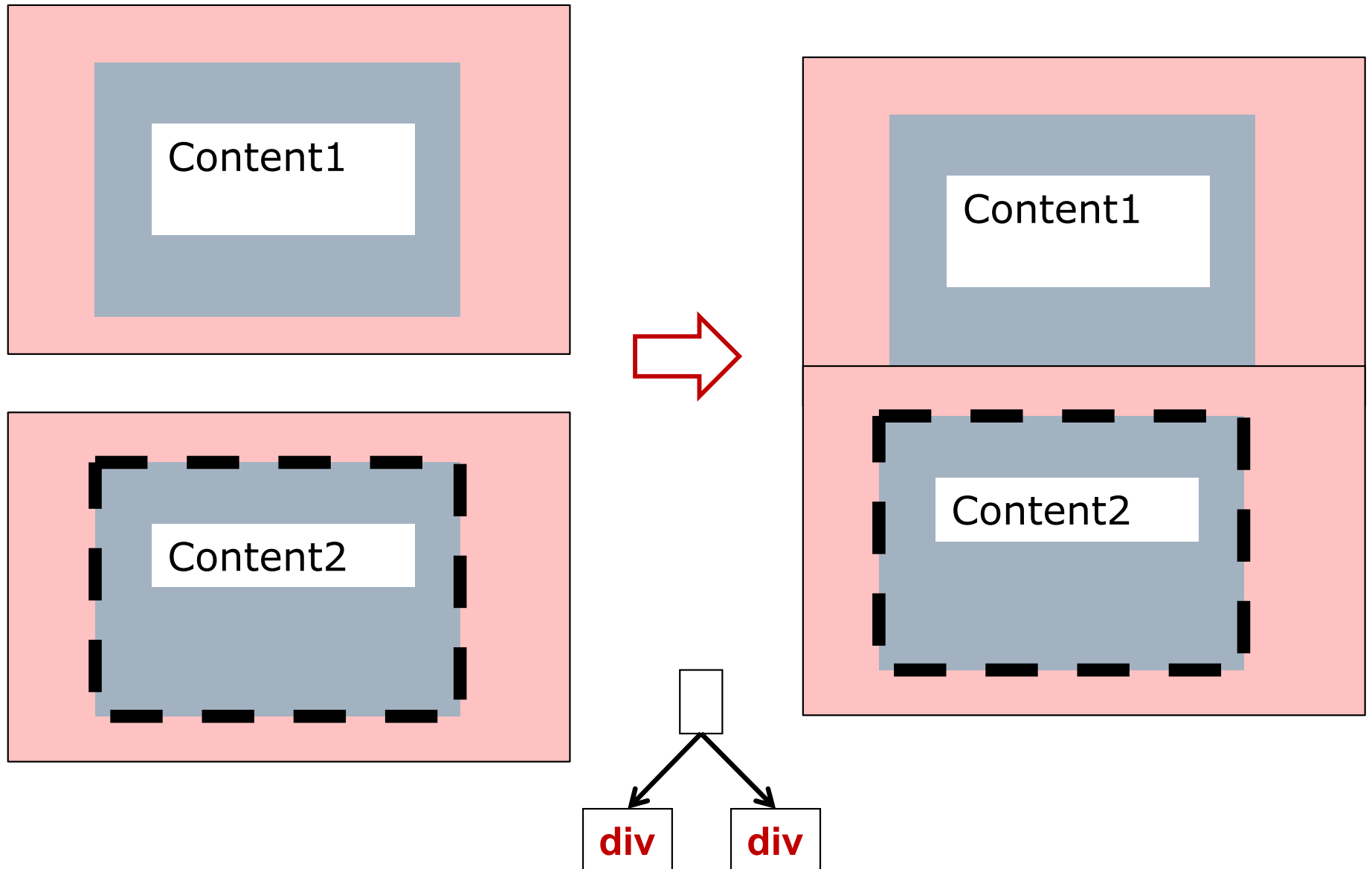
Box Sizing

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

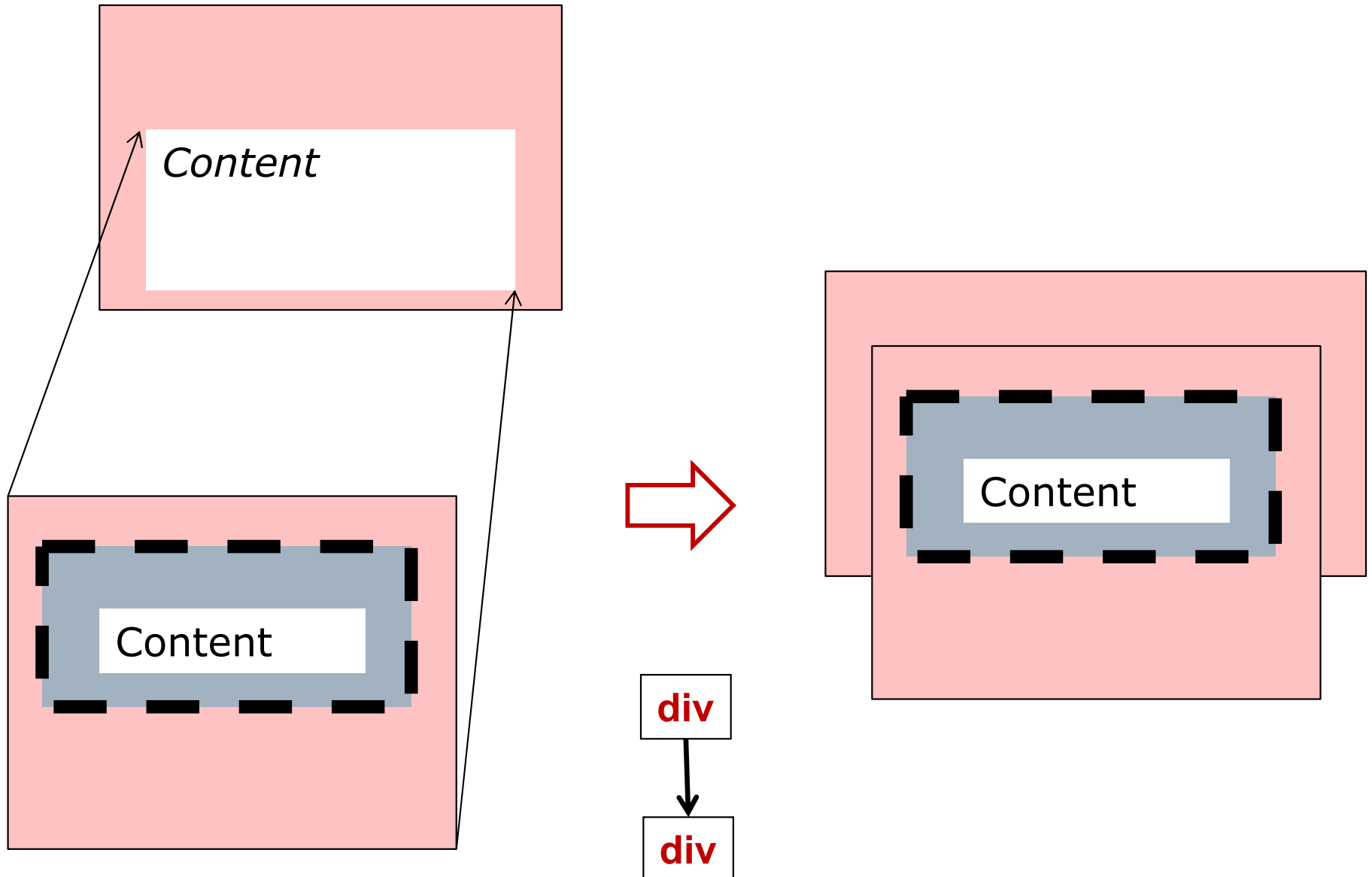


- ❑ Total width = ?
- ❑ CSS3 adds box-sizing
 - content-box (width sizes content only)
 - border-box (width includes border & padding)

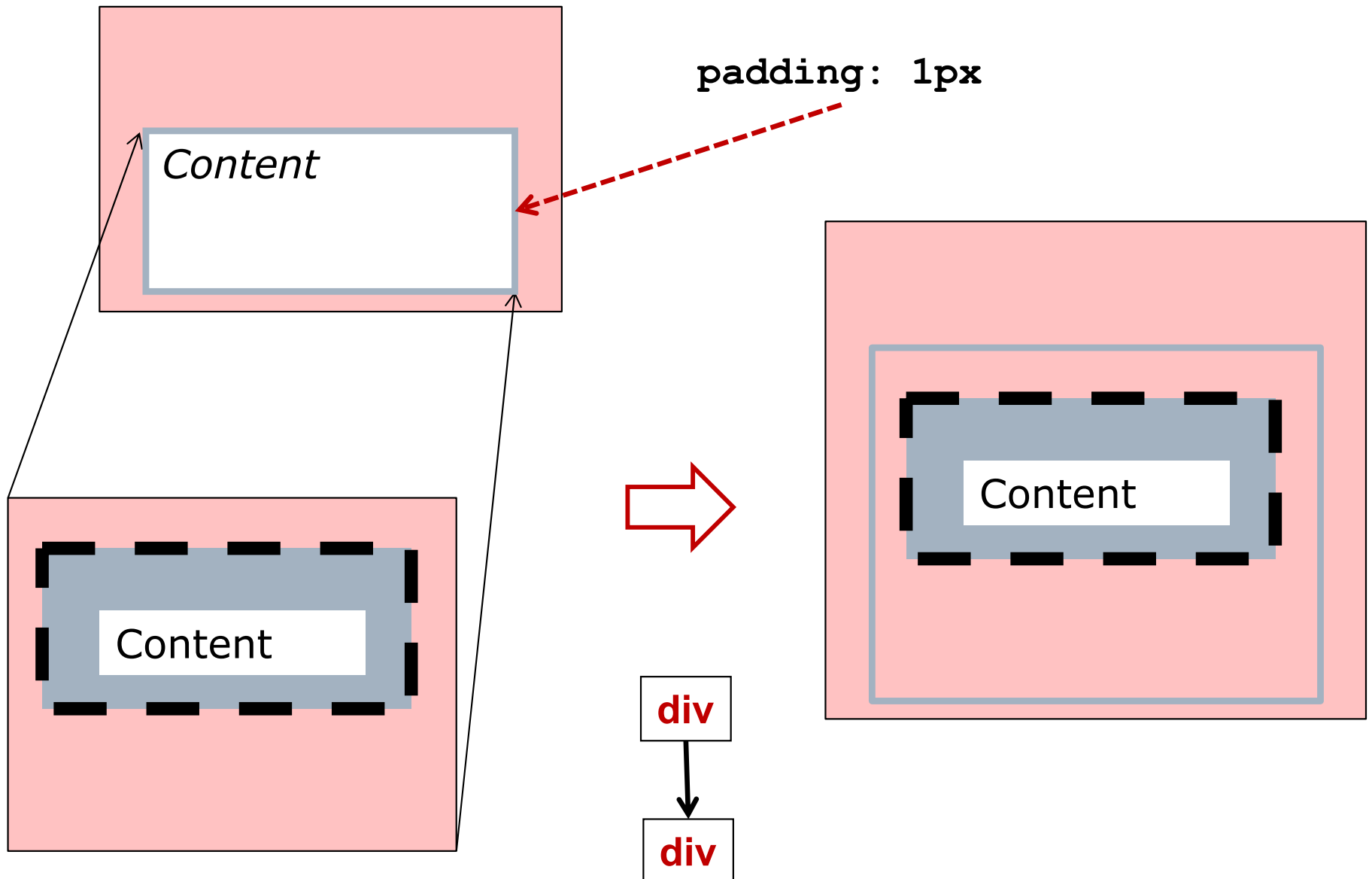
Collapsing Vertical Margins



Collapsing Nested Margins



Preventing Margin Collapse



Demo: Chrome Dev. Tools

The image shows a browser window displaying a CodePen page titled "CSS example". The page content includes an

CSS example

, a paragraph "This page is full of goodness!", and an

Things to Note

. A red arrow points from the

Things to Note

 element in the page to the corresponding element in the Chrome DevTools Elements panel. The DevTools interface shows the DOM tree with the

Things to Note

 element selected. The Styles panel displays the computed styles for this element, including a margin of 19.920, a border, and padding. A diagram in the Styles panel illustrates the box model with a blue box representing the content (669x28), a green box for padding, a yellow box for border, and an orange box for margin. The bottom of the Styles panel shows a list of styles: display: block, font-family: sans-serif, font-size: 24px, font-weight: 700, and height: 28px.

```
<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body translate="no">
    <h1> CSS example</h1>
    <p>This page is full of goodness!</p>
    <h2>Things to Note</h2>
    ...
  </body>
</html>
```

margin 19.920
border -
padding -
669x28
19.920

Filter Show all Group

- display block
- font-family sans-serif
- font-size 24px
- font-weight 700
- height 28px

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