

Front-end Development HTML and CSS



Fundamental Web Programming

Asst. Prof. Manop Phankokkruad, Ph.D.

School of Information Technology

King Mongkut's Institute of Technology Ladkrabang



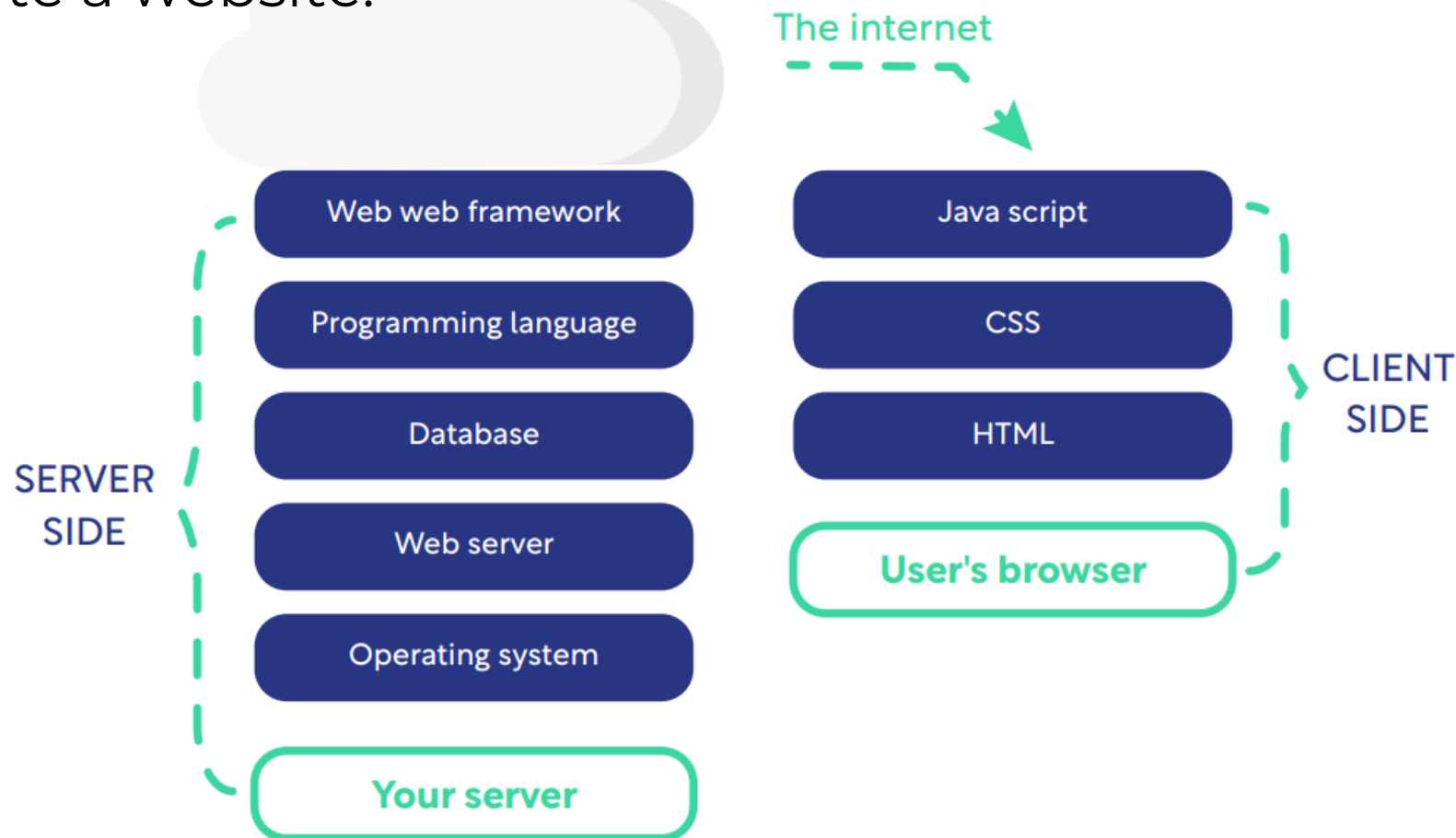
Outline

1. Web Development Overview
2. Hypertext Markup Language(HTML)
3. Cascading Style Sheets(CSS)



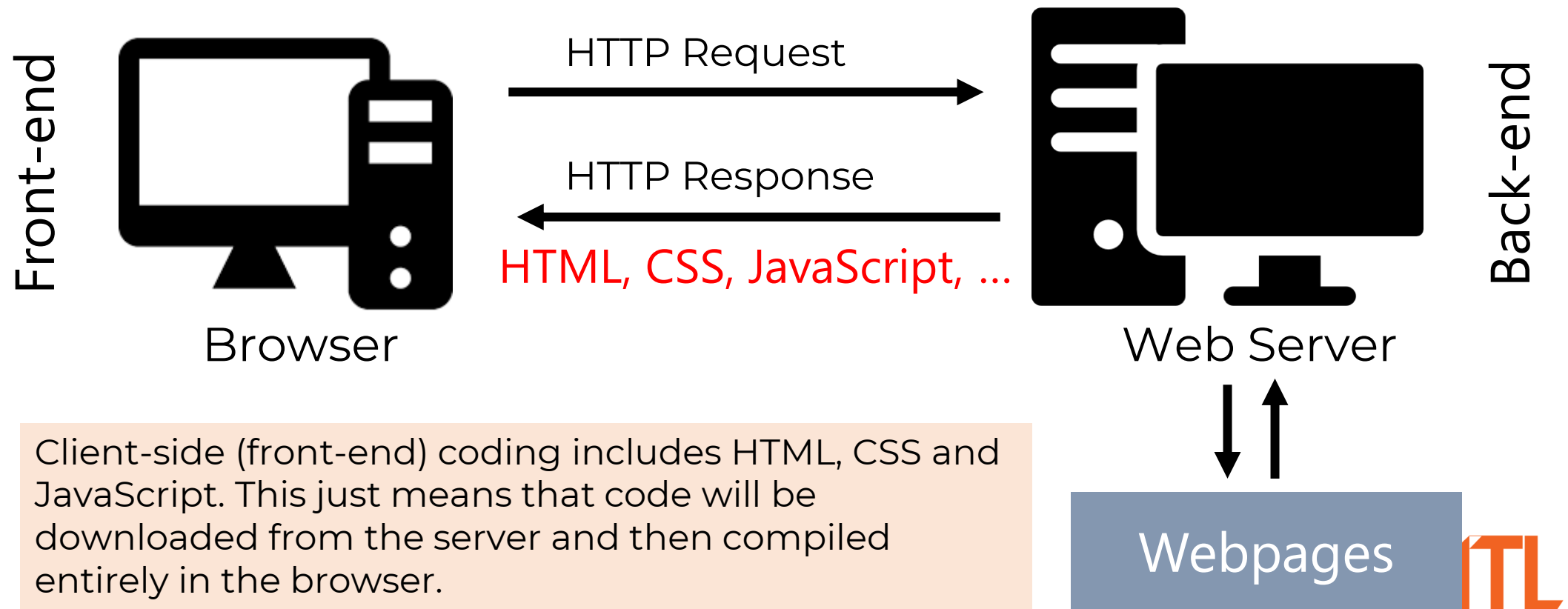
Overview

A technology stack is a collection of software, apps, programming languages, and tools that work together to create a website.



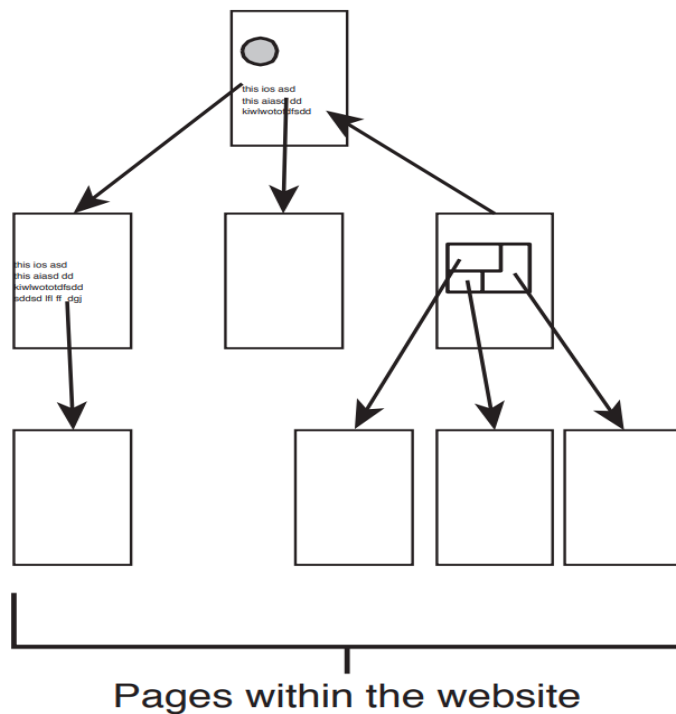
Overview

A website is a group of self-contained, individual pages, sent to the browser from the server one-page at a time.

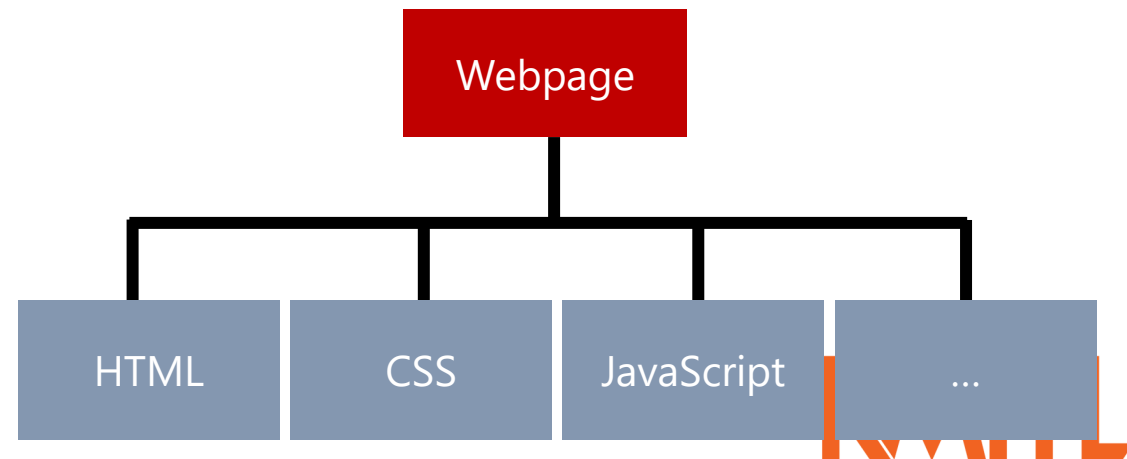


Overview

Most websites contain both static and dynamic elements. A dynamic web content is built when it is requested, by the user directly, or programmatically while a user is on a page.



Web page is a single document on a website, usually consisting of a HTML document and any items that are displayed within that document, such as inline images or style sheets.



Common front-end web development:

- HTML
- CSS
- JavaScript

Three layers of web design:

- Structure - HTML, Site planning
- Style - CSS, Imagery
- Behavior - JavaScript

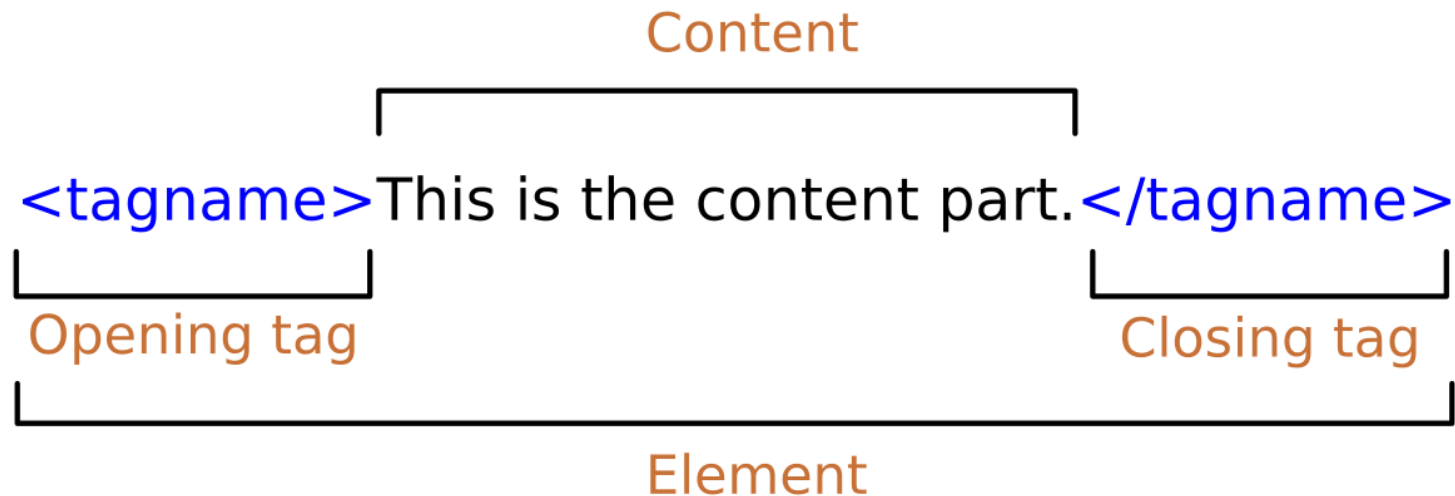
- **HTML** (Hypertext Markup Language) is the standard markup language used to create web pages and web applications. Its elements form the building blocks of pages, representing formatted text, images, form inputs, and other structures.
- **Hypertext** is text which contains links to other texts.



- A **markup language** is a set of markup tags. The purpose of the tags is to group and describe page content.

Element Tags

The fundamental building block in HTML document is the element tag. An **opening tag** indicates the beginning of that element, while a **closing tag** indicates the ending.



`<h1>Hello World</h1>`

HTML: Elements

The essential element tags

- A text header, denoted using the `<h1>`, `<h2>`, `<h3>`, `<h4>`, `<h5>`, `<h6>` tags.
- A paragraph, denoted using the `<p>` tag.
- A horizontal ruler, denoted using the `<hr>` tag.
- A link, denoted using the `<a>` (anchor) tag.
- A list, denoted using the `` (unordered list), `` (ordered list) and `` (list element) tags.
- An image, denoted using the `` tag
- A divider, denoted using the `<div>` tag
- A text span, denoted using the `` tag

HTML: Elements

The essential element tags

Primary Structure

- html
- head
- body

Head Elements

- title
- meta
- link

Structural Elements

- p
- br
- h1 , h2, h3, ..., h6
- ul
- ol
- a
- img
- div

HTML: Elements

The essential element tags (cont.)

Formatting Elements

- em
- i
- strong
- b
- q
- blockquote
- span

Element Attributes

Attribute provides additional information to the browser about the purpose of the element. The general syntax of an element attribute within a two-sided tag is

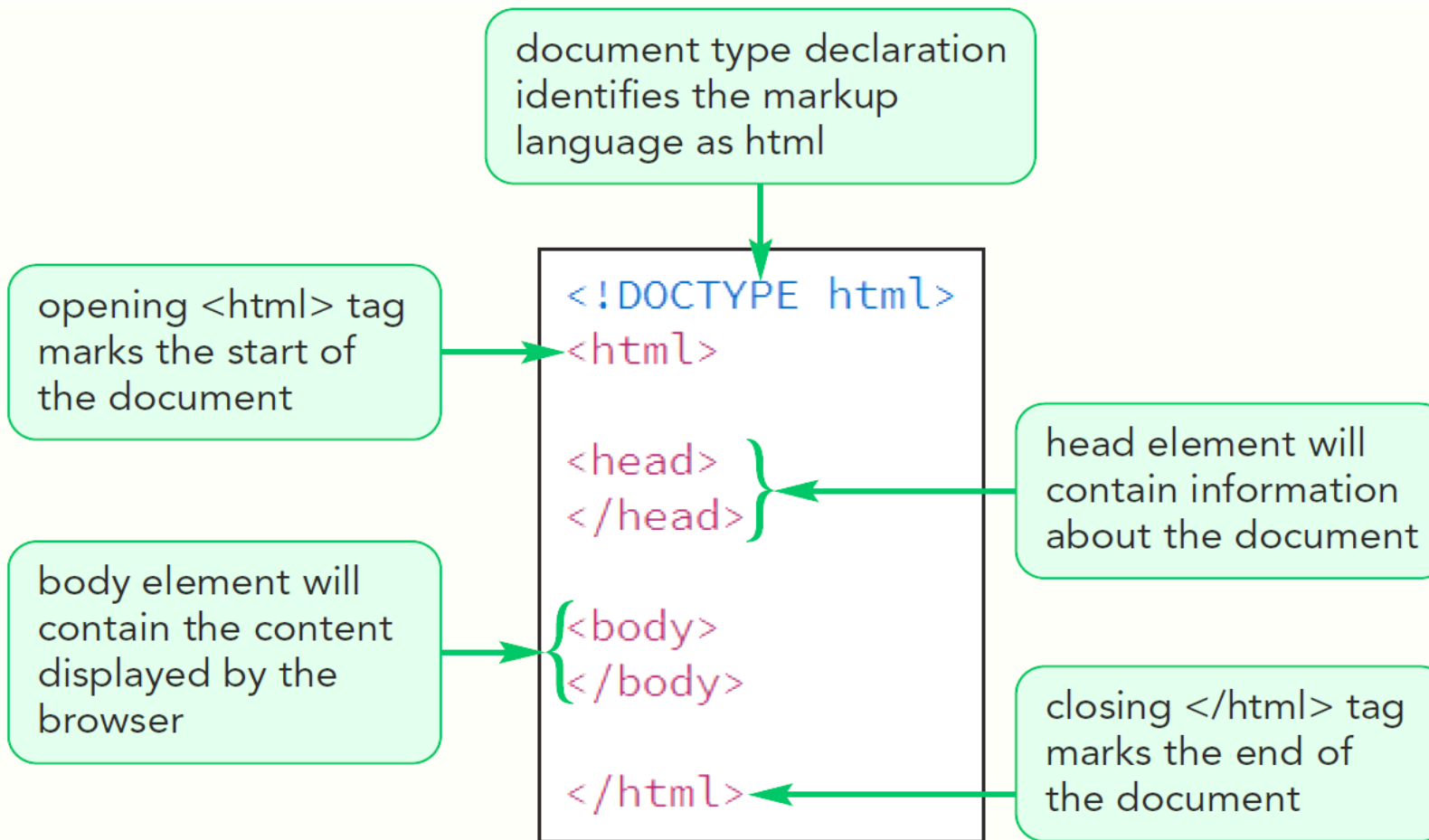
```
<tagname attr1="value1" attr2="value2" >  
  My text content  
</tagname >
```

For example

```
<p id="intro">This is my first paragraph.</p>
```

HTML Document Basic Structure

Look at a small example file to gain a more concrete understanding of HTML syntax and semantics.



HTML Document Basic Structure

The **document head** contains metadata, which is content that describes the document or provides information about how the document should be processed by the browser.

link	Specifies an external resource that the document is connected to
meta	Provides a generic list of metadata values such as search keywords, viewport properties, and the file's character encoding
script	Provides programming code for programs to be run within the document
style	Defines the display styles used to render the document content
title	Stores the document's title or name, usually displayed in the browser title bar or on a browser tab



HTML : Nesting

The use of first three tags (html, head and body), introduces an important concept: Nesting, which is when tags “wrap” other tags.

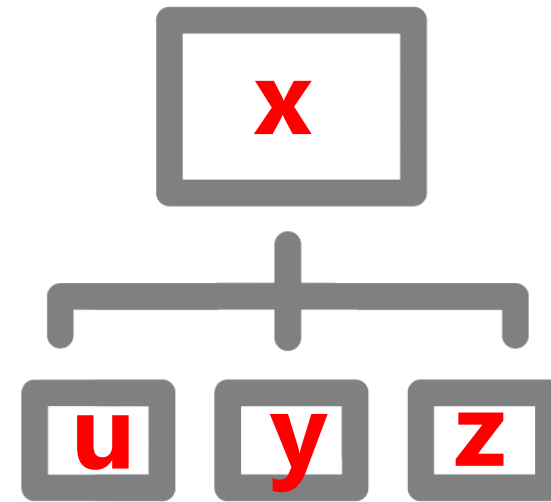
```
<html>
  <head></head>
  <body>
    <h1></h1>
    <div>
      <p>Hello</p>
    </div>
  <p></p>
</body>
</html>
```

When you create markup, you should indicate nesting by indenting the nested tags with 2 spaces (preferred) or a tab.

HTML: Document Hierarchy

Document Hierarchy: Parents, children and siblings

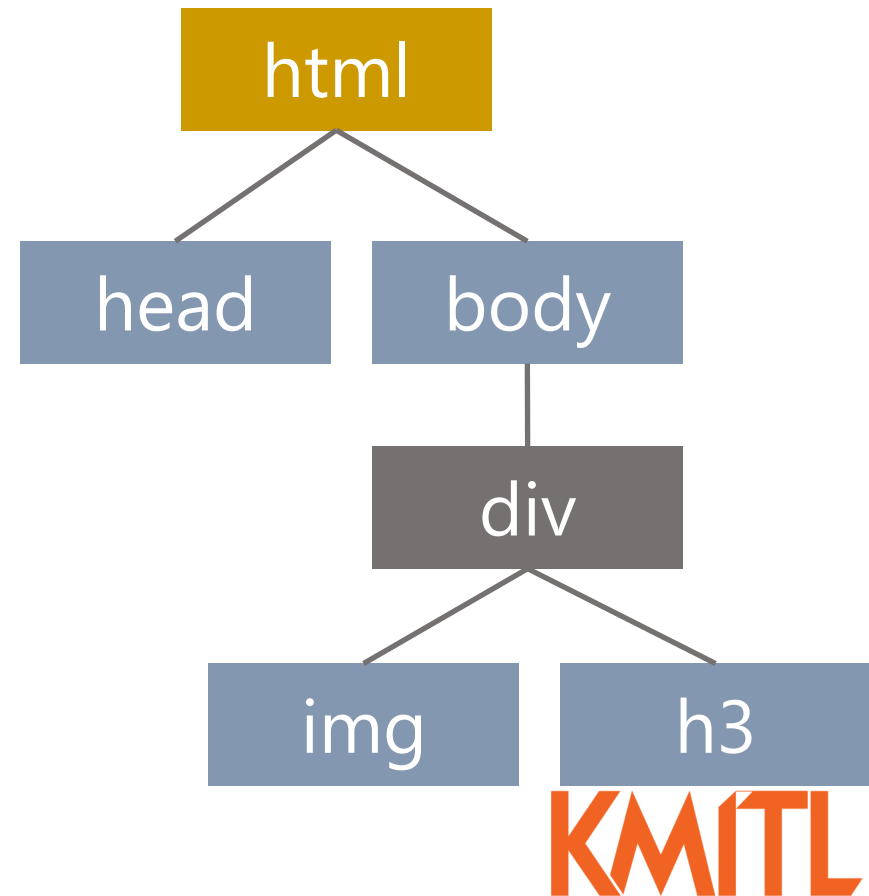
```
<parentX>  
  <childU> Content 1 </childU>  
  <childY> Content 2 </childY>  
  <childZ> Content 3 </childZ>  
</parentX>
```



HTML: Document Hierarchy

Document Hierarchy: Parents, children and siblings

```
<html>
<head></head>
<body>
  <div id="logo">
    
    <h3>Hello</h3>
  </div>
</body>
</html>
```



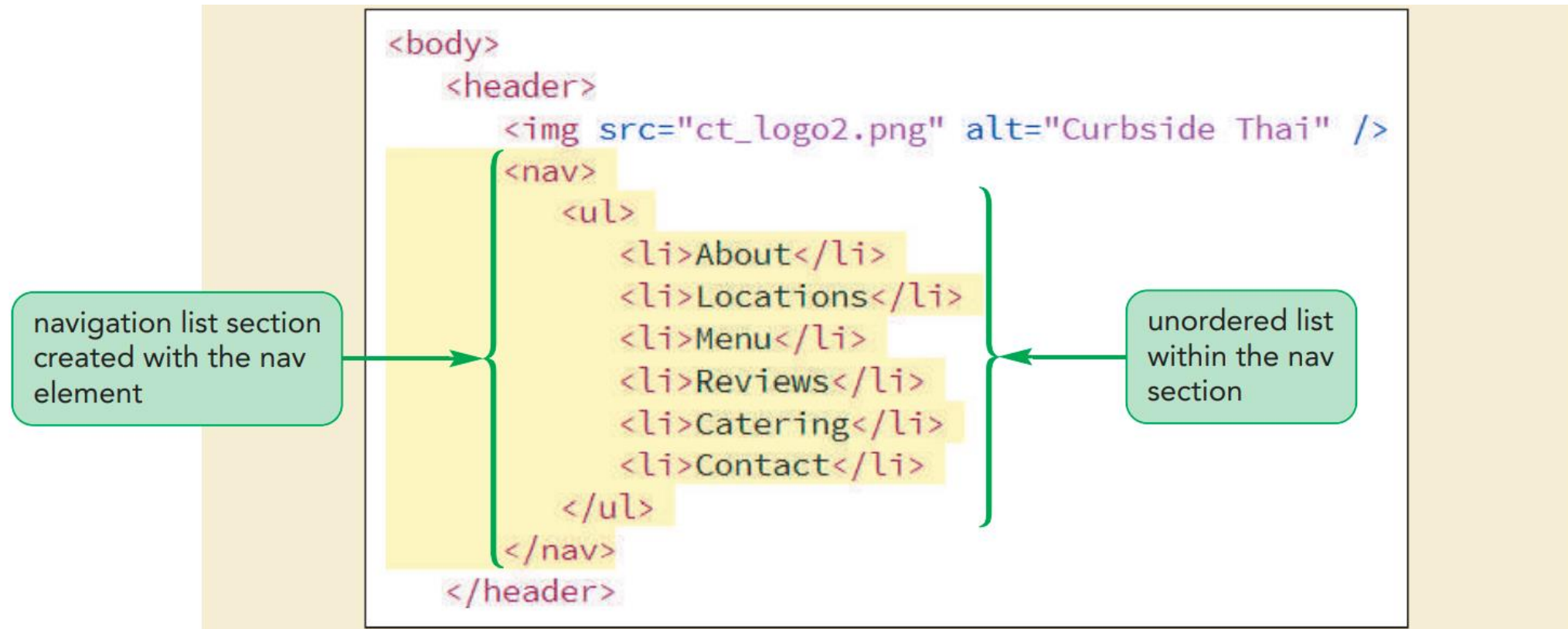
HTML : Tables

- HTML table is defined with the **<table>** tag.
- Each table row is defined with the **<tr>** tag.
- A table header is defined with the **<th>** tag. By default, table headings are bold and centered.
- A table data/cell is defined with the **<td>** tag.

```
<table>
  <tr>
    <th>Month</th>
    <th>Savings</th>
  </tr>
  <tr>
    <td>January</td>
    <td>$100</td>
  </tr>
</table>
```

HTML : Lists

HTML lists allow web developers to group a set of related items in lists.



HTML : Comments

A comment is descriptive text that is added to the HTML file but that does not appear in the browser window when the page is displayed.

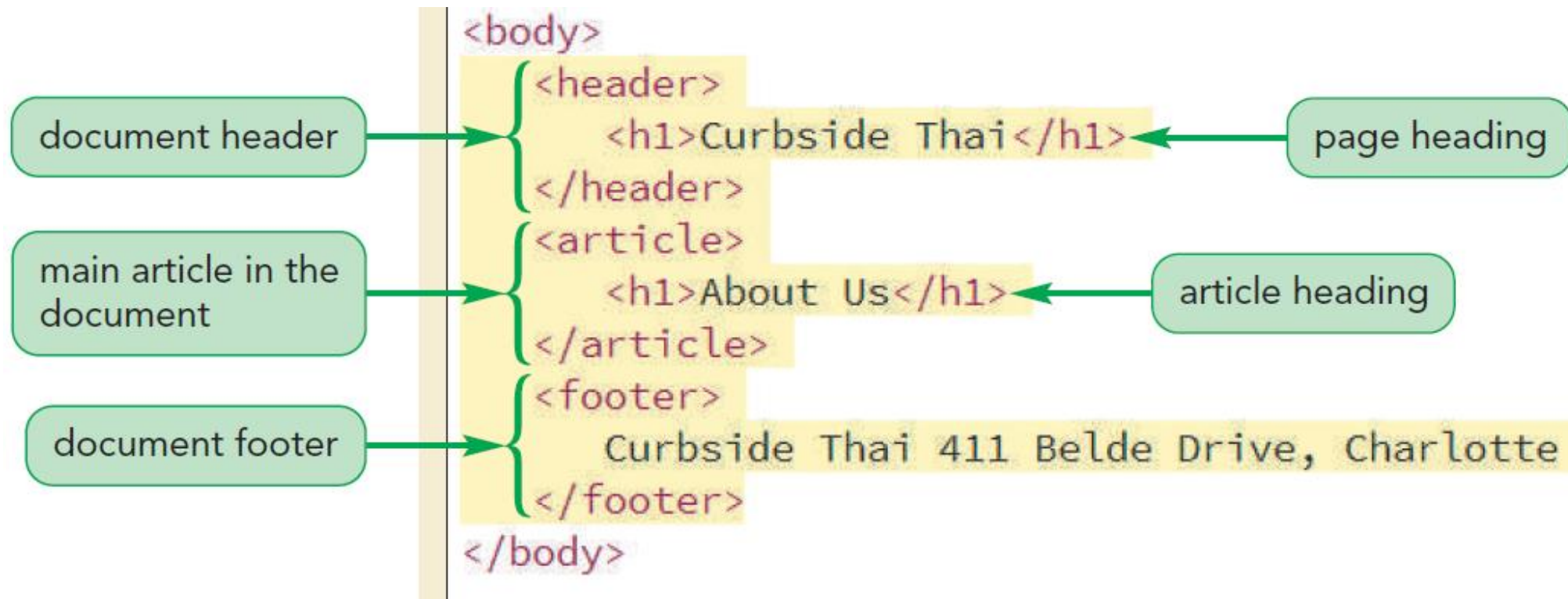
Comment added
to the document

```
<head>
  <!--
    New Perspectives on HTML5 and CSS3, 7th Edition
    Tutorial 1
    Tutorial Case
    General Information about Curbside Thai
    Author: your name
    Date:   the date

    Filename: ct_about.html
  -->
  <meta charset="utf-8" />
  <meta name="keywords" content="Thai, restaurant, C
  <title>About Curbside Thai</title>
</head>
```

HTML : Sectioning Elements

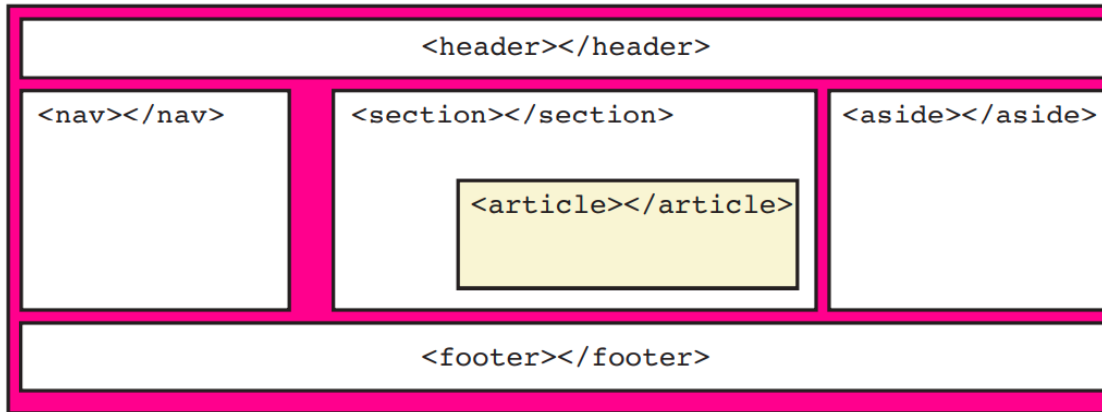
A page typically has a header, one or more articles that are the chief focus of the page, and a footer. HTML marks these major topical areas using the sectioning elements



HTML : Sectioning Elements

The advantage of the HTML5 sectioning elements is that their tag name indicates their purpose in the document, leading to greater uniformity in how pages are designed and interpreted.

HTML 5.0



HTML 4.01

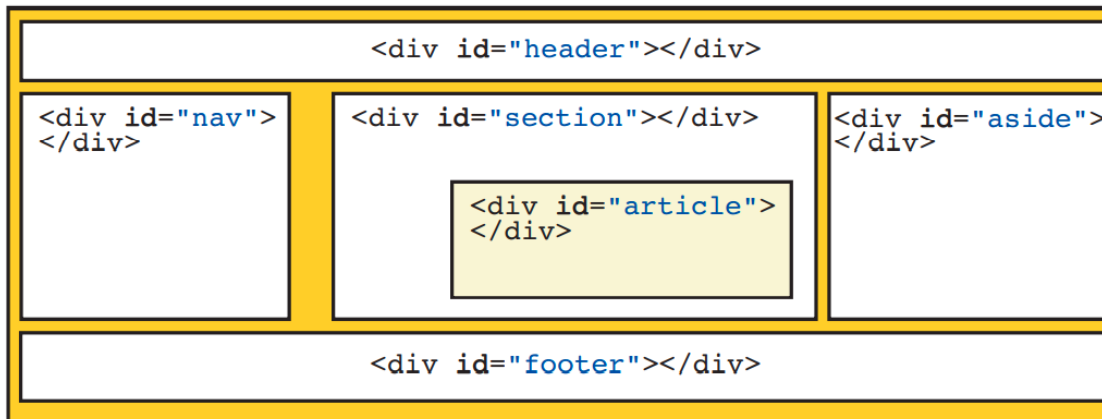


Figure: Sections in HTML 5.0 vs. divisions in HTML 4.01

- **CSS (Cascading Style Sheets)** is used to control the look and layout of HTML elements. CSS styles can be applied directly to an HTML element, defined separately on the same page, or defined in a separate file and referenced by the page.
- A **style sheet** is a set of rules defining how an HTML element will be presented in the browser. These rules are targeted to specific elements in the HTML document.
- The **cascade** part is a set of rules for resolving conflicts with multiple CSS rules applied to the same elements.

Link an HTML document to a Style Sheet

- **Browser Style Sheet** – the browsers put default styling on some elements.
- **External Style Sheet**

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

link elements link the web page to a style sheet file

filename of the CSS style sheet

rel attribute indicates the type of link relationship

```
<meta charset="utf-8" />
<meta name="keywords" content="Thai, restaurant, Charlotte, food" />
<title>About Curbside Thai</title>
<link href="ct_base.css" rel="stylesheet" />
<link href="ct_layout2.css" rel="stylesheet" />
</head>
```


Link an HTML document to a Style Sheet

- **Internal / Embedded Style Sheet**

```
<html>
<head>
<style>
body {background-color: powderblue;}
h1   {color: blue;}
p    {color: red;}
</style>
</head>
```

- **Inline Styles**

```
<h1 style="color:blue;">This is a Blue Heading</h1>
```



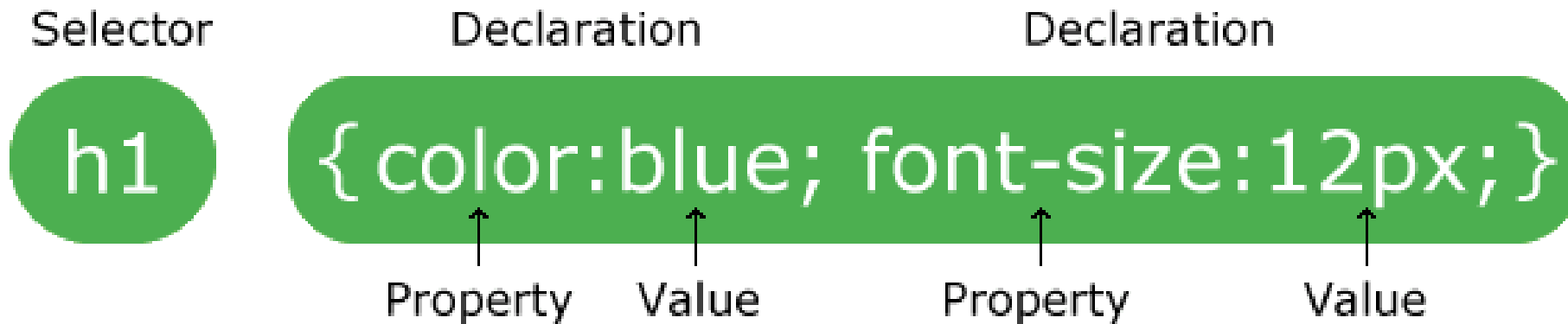
CSS : Syntax

Syntax is the rules for how to write the language.
Three terms for describing the styles:

- CSS rules
- CSS selector
- CSS declaration

CSS : Rules

A CSS rule-set consists of a ***selector*** and a ***declaration*** block.



The ***selector*** points to the HTML element you want to style. The declaration block contains one or more declarations separated by semicolons.

CSS : Syntax

A style rule defines the styles applied to an element or group of elements, is the building block of the CSS style sheet. Style rules have the general form

Format

```
selector {  
    property1: value1;  
    property2: value2;  
    ...  
}
```

Selectors can also be entered as comma-separated lists as in the following style rule.

Example

```
h1 {  
    color: red;  
    text-align: center;  
}
```

Example

```
h1, h2 {  
    color: red;  
}
```

CSS : Selector

The **selector** associates the CSS rules with HTML elements.

The **font-family** property lists the possible fonts used for the element text.

The **font-size** property sets the text size in absolute or relative units.

The **letter-spacing** property sets the **Kerning** or space between letters.

```
body {  
  color: rgb(91, 91, 91);  
  background-color: ivory;  
  font-family: Verdana, Geneva, sans-serif;  
}
```

```
h1 {font-size: 2.2em;}  
h2 {font-size: 1.5em;}
```

The **em unit** is a relative unit of length that expresses a size relative to the font size of the containing element.

```
h1, h2 {  
  font-family: Quicksand, Verdana, Geneva, sans-serif;  
  letter-spacing: 0.1em;  
}
```

```
aside blockquote {  
  color: rgb(232, 165, 116);  
}
```

The **aside blockquote** selector selects blockquote elements that are descendants of the aside element.

CSS : Selectors

Essential selector types :

- **type/element** selector
- **id** selector
- **class** selector

element p { property: value ; }

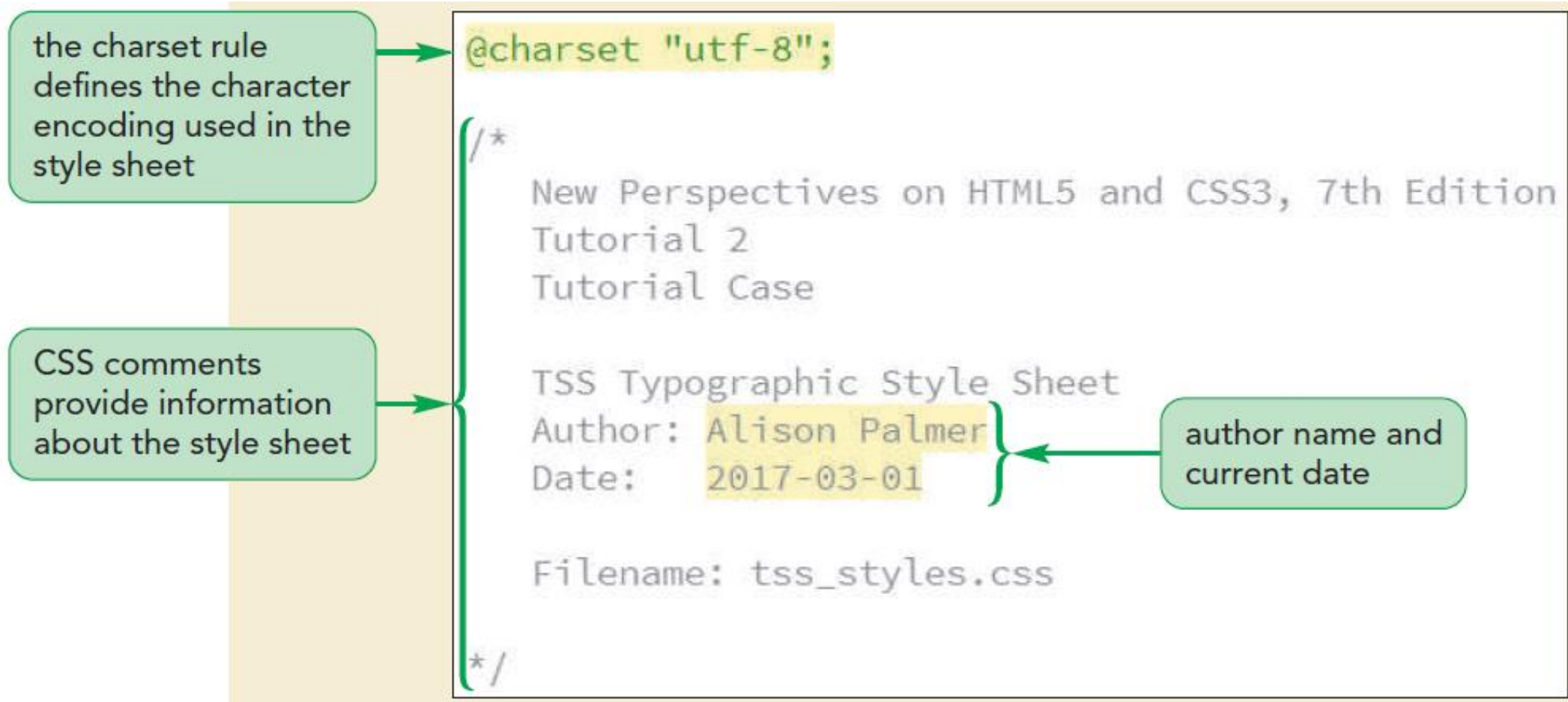
id #id { property: value ; }

class .class { property: value ; }

body, p, h1, ul are the simplest type selector, which targets an html element by name.

Creating a Style Sheet

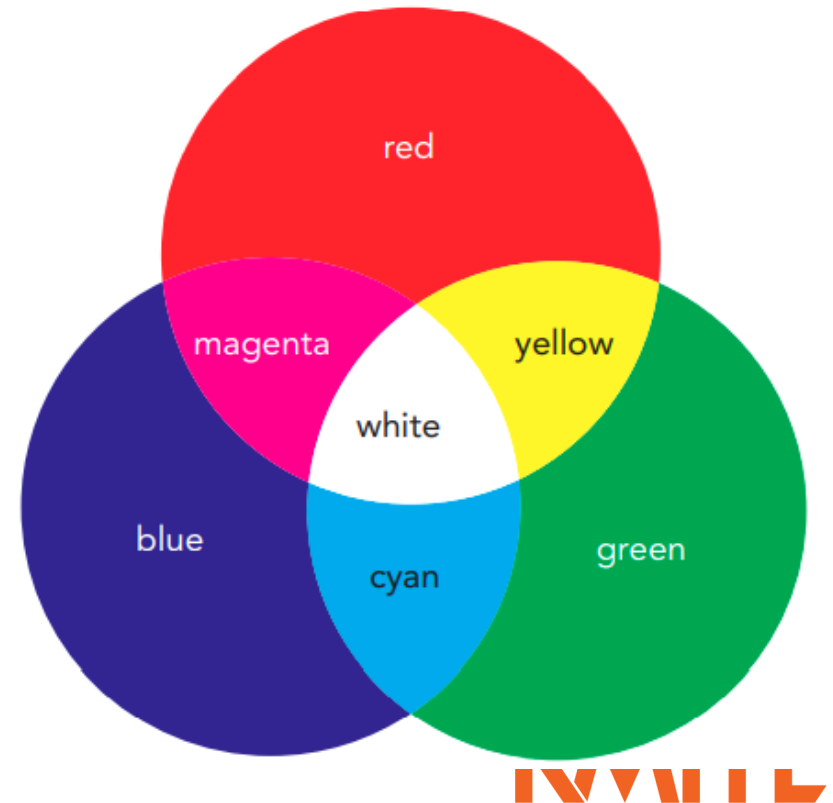
Adding the **@charset** rule and style comments



Working with Color

CSS supports 147 color names covering common names such as red, green, and yellow to more exotic colors such as ivory, orange, crimson, khaki, and brown.

CSS also supports color values, in which the color is given by an exact numeric representation. CSS3 supports two types of color values: **RGB** values and **HSL** values



Working with Color

Varying the intensity of the three primary colors extends the palette to other colors. CSS represents these intensities mathematically as a set of numbers called an RGB triplet, which has the format.

Format

`rgb(red, green, blue)`

Example

`rgb(255, 10, 0)`

where *red*, *green*, and *blue* are the intensities of the red, green, and blue components of the color.

Intensities range from 0 to 255

Working with Color

RGB values are sometimes expressed as hexadecimal numbers where a hexadecimal number is a number expressed in the base 16 numbering system

Format

#**red**green**blue**

Example

#**FFFF00**

Hexadecimal numbering includes these ten numeric characters and six extra characters: A (for 10), B (for 11), C (for 12), D (for 13), E (for 14), and F (for 15). For values above 15.

Working with Color

HSL color values are based on a color model in which each color is determined by its hue, saturation, and lightness.

Format

`hsl(hue, saturation, lightness)`

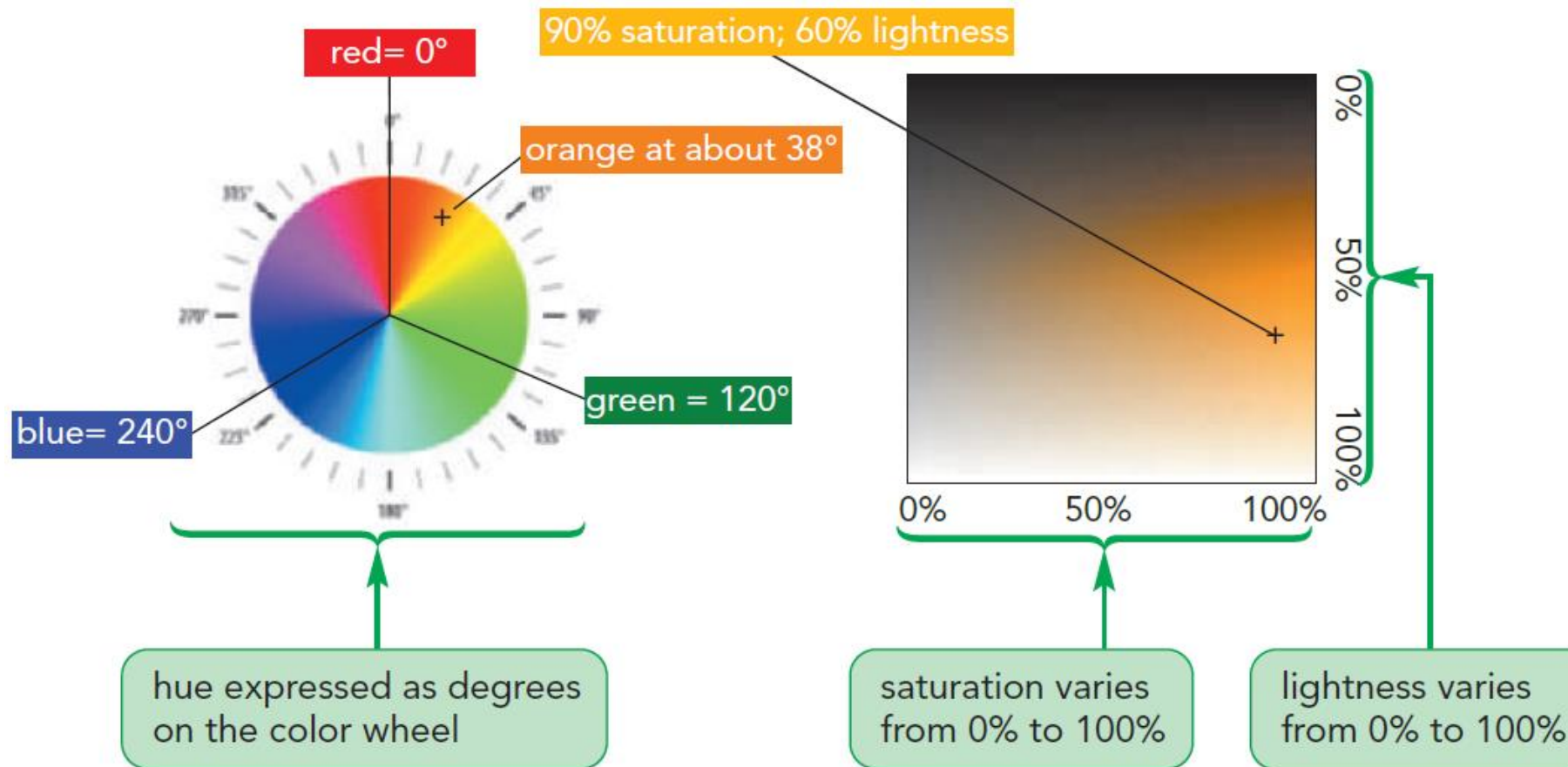
Example

`hsl(38, 90%, 60%)`

Graphic designers consider HSL easier to use because it allows them to set the initial color based on hue and then fine-tune the saturation and lightness values.

Working with Color

Defining the color orange under the HSL color model.
For example : `hsl(38, 90%, 60%)`



Working with Color

Setting Text and Background Colors - CSS supports the following styles to define both the text and background color for each element on your page

Format

```
color: color;  
background-color: color;
```

Example

```
html { background-color: hsl(27, 72%, 72%); }  
body {  
    color: rgb(91, 91, 91);  
    background-color: ivory;  
}
```

Working with Fonts

Fonts define the style and appearance of each character in the alphabet. The default font is Times New Roman, but you can specify a different font for any page element using the following **font-family** property

Format

font-family: fonts;

Example

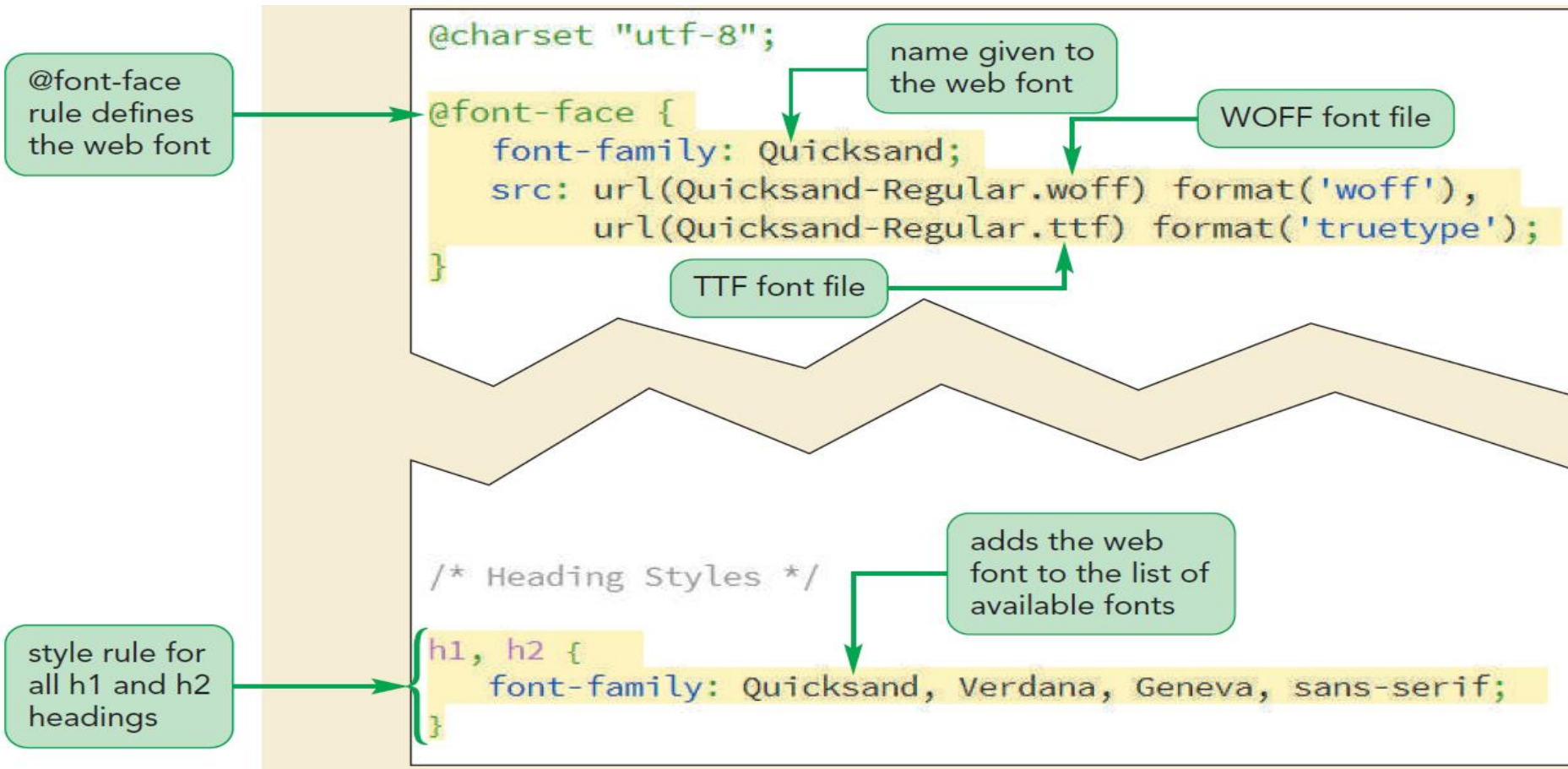
font-family: 'Arial Black';

browser attempts to use the Verdana font first, followed by Geneva, and finally any generic sans-serif font

```
body {  
  color: rgb(91, 91, 91);  
  background-color: ivory;  
  font-family: Verdana, Geneva, sans-serif;  
}
```

Working with Fonts - Web Fonts

To access and load a **web font**, add the following **@font-face** rule to the style sheet



More Information

- HTML5 Tutorial
<https://www.w3schools.com/html/>
- CSS Tutorial
<https://www.w3schools.com/css/default.asp>
- Learn HTML
<https://www.learn-html.org/>