

Cascading Style Sheet

Motivation

- HTML markup can be used to represent
 - **Semantics**: h1 **means** that an element is a top-level heading
 - **Presentation**: h1 elements **look** a certain way
- It's advisable to separate semantics from presentation because:
 - It's easier to present documents on **multiple platforms** (browser, cell phone, spoken, ...)
 - It's easier to generate documents with **consistent look**
 - Semantic and presentation changes can be made independently of one another (**division of labor**)
 - **User control** of presentation is facilitated

Style Sheet Languages

- Cascading Style Sheets ([CSS](#))
 - Applies to (X)HTML as well as XML documents in general
 - Focus of this chapter
- Extensible Stylesheet Language ([XSL](#))
 - Often used to transform one XML document to another form, but can also add style
 - XSL Transformations covered in later chapter

Three Ways to Insert CSS

- External style sheet
- Internal style sheet
- Inline style

Inline style sheet

- Placed inside tags.
- Specific to a single instance of an html tag on a page.
- **Must** be used instead of tags to specify font size, color, and typeface and to define margins, etc.
- Use to override an external or embedded style specification.

Local (inline)

- Example

```
<p style="font-size: 10pt; color: red; font-weight: bold;  
font-family: Arial, Helvetica, sans-serif">
```

This is a local stylesheet declaration. </p>

On the browser:



This is a local stylesheet declaration.

Internal style sheet

- **Embedded** or **internal** style sheet
- Applicable to an entire document
- Styles are defined within the `<style> </style>` tag, which is placed in the **header** of the html file (i.e., within `<head>` and `</head>`).

Internal style sheet

- Example:

```
<html>
  <head>
    <title>Title</title>
    <style type="text/css">
      <!--[STYLE INFORMATION GOES HERE] -->
    </style>
  </head>
  <body>
    [DOCUMENT BODY GOES HERE]
  </body>
</html>
```



```
<!DOCTYPE html>
<html>
<head>
<style>
body {
  background-color: linen;
}
h1 {
  color: maroon;
  margin-left: 40px;
}
</style>
</head>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

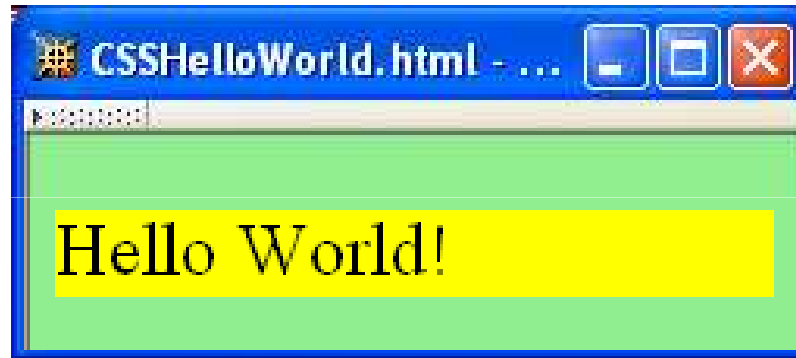
This is a heading
This is a paragraph.

External style sheet

- Styles are saved in a separate file, with the extension **.css**
- This single stylesheet can be used to define the look of multiple pages.

External style sheet

- A styled HTML document



produced by the style sheet `style1.css`:

```
body { background-color:lime }  
p    { font-size:x-large; background-color:yellow }
```

CSS Introduction

```
<!DOCTYPE html
  PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>
      CSSHelloWorld.html
    </title>
    <link rel="stylesheet" type="text/css" href="style1.css"
      title="Style 1" />
    <link rel="alternate stylesheet" type="text/css" href="style2.css"
      title="Style 2" />
  </head>
  <body>
    <p>
      Hello World!
    </p>
  </body>
</html>
```

link element associates style sheet with doc.

CSS Introduction

```
<!DOCTYPE html
  PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
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    <link rel="stylesheet" type="text/css" href="style1.css"
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    </p>
  </body>
</html>
```

type attribute specifies style language used

CSS Introduction

```
<!DOCTYPE html
  PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>
      CSSHelloWorld.html
    </title>
    <link rel="stylesheet" type="text/css" href="style1.css"
          title="Style 1" />
    <link rel="alternate stylesheet" type="text/css" href="style2.css"
          title="Style 2" />
  </head>
  <body>
    <p>
      Hello World!
    </p>
  </body>
</html>
```

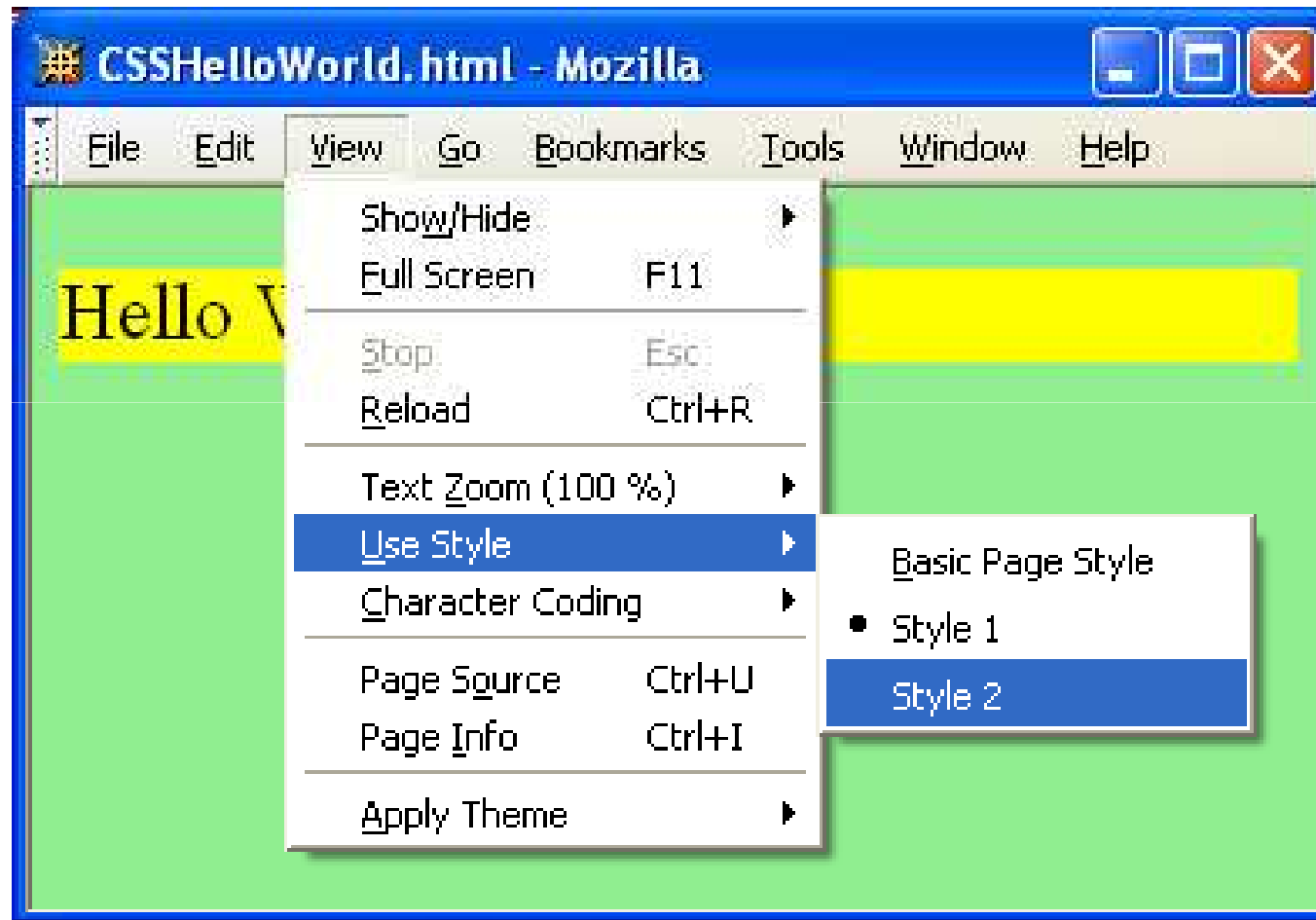
href attribute provides style sheet URL

CSS Introduction

```
<!DOCTYPE html
  PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>
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    </title>
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  </head>
  <body>
    <p>
      Hello World!
    </p>
  </body>
</html>
```

title attribute provides style sheet name

CSS Introduction



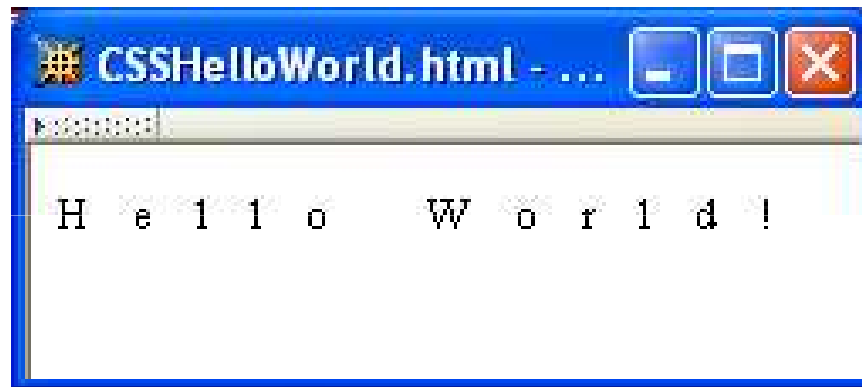
CSS Introduction

```
<!DOCTYPE html
  PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
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  </head>
  <body>
    <p>
      Hello World!
    </p>
  </body>
</html>
```

Alternative, user selectable style sheets
can be specified

CSS Introduction

- A styled HTML document



produced by the style sheet `style2.css`:

```
p { font-size:smaller; letter-spacing:1em }
```

CSS Introduction

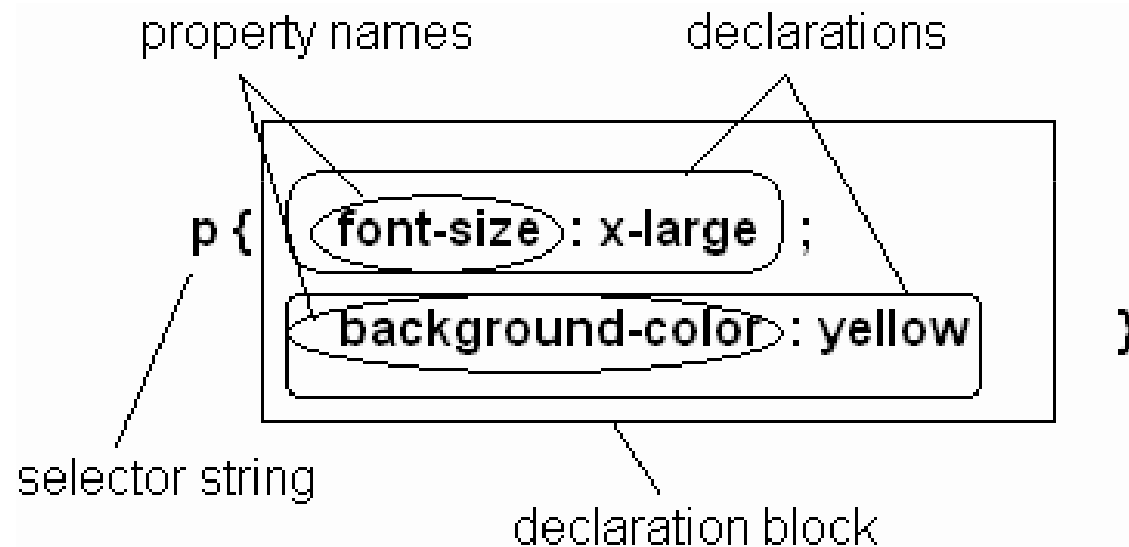
- Single document can be displayed on multiple media platforms by tailoring style sheets:

```
<link rel="stylesheet" type="text/css" href="style1.css"
      media="screen, tv, projection" />
<link rel="stylesheet" type="text/css" href="style2.css"
      media="handheld, print" />
```

This document will be **printed** differently than it is **displayed**.

CSS Syntax

- Parts of a **style rule** (or **statement**)



CSS Syntax: Selector Strings

- Single element type:

```
p { font-size:smaller; letter-spacing:1em }
```

- Multiple element types:

```
h1,h2,h3,h4,h5,h6 { background-color:purple }
```

- All element types:

```
* { font-weight:bold }
```

- Specific elements by id:

```
#p1, #p3 { background-color:aqua }
```

CSS Syntax: Selector Strings

- Single element type:

 { font-size:smaller; letter-spacing:1em }
type selector

- Multiple element types:

 ,h2,h3,h4,h5,h6 { background-color:purple }

- All element types:

* { font-weight:bold }

- Specific elements by id:

#p1, #p3 { background-color:aqua }

CSS Syntax: Selector Strings

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p { font-size:smaller; letter-spacing:1em }
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- All element types:

```
 { font-weight:bold }
```

universal selector

- Specific elements by id:

```
#p1, #p3 { background-color:aqua }
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CSS Syntax: Selector Strings

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p { font-size:smaller; letter-spacing:1em }
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h1,h2,h3,h4,h5,h6 { background-color:purple }
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- All element types:

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* { font-weight:bold }
```

- Specific elements by id:

```
#p1, #p3 { background-color:aqua }
```

ID selector

The class Selector

- With a class selector you can define different styles for the same type of HTML element
- Examples:

First define the class:

```
p.right {text-align: right; color: red; font-style: italic}
```

```
p.blue {text-align: center; color:blue}
```

Then use the class in your HTML code :

```
<p class="right"> This paragraph will be right-aligned, italic, and red. </p>
```

```
<p class="blue"> This paragraph will be center-aligned and blue. </p>
```

The class Selector

- You can also omit the tag name in the selector to define a style that will be used by all HTML elements that have this class.

- Example:

`.poem {text-align: center; font-style: italic}`

Any HTML element with `class="poem"` will be center-aligned and italic.

The class Selector

- Example (continued)

Both elements below will follow the rules in the ".poem" class:

`<h1 class="poem">` This heading will be center-aligned and italic `</h1>`

`<p class="poem">` This paragraph will also be center-aligned and italic. `</p>`

Class Example

```
<style>
  p {font-family: sans-serif; font-size: 10pt}
  h1 {font-family: serif; font-size: 30pt}
  h2 {font-family: serif; font-size: 24pt}
  .boldred {color: red; font-weight: bold}
  .green {color: green}
  .tinyblue {color: blue; font-size: 8pt}
</style>
```

The tags and classes can then be used in combination:

```
<h1 class="boldred">This is rendered as 30-point red serif bold text.</h1>
<p class="boldred">This is rendered as 10-point red sans-serif bold text.</p>
```

Multiple Styles Cascade Into One

- What style will be used when there is more than one style?
 - Browser default
 - External style sheets are included
 - Embedded styles (inside the <head> tag) override external styles
 - Inline styles (inside an HTML element) override both embedded and external styles
 - Styles modified with JavaScript override all other styles