Internet Fundamentals & Introduction to Web Technologies

Course: IT (044615)

Lecture: 3

Cascading

Style Sheets

Dr. Ramez Hajislam

3.1 Introduction

- **The CSS1 specification was developed in 1996**
- **CSS2 was released in 1998**
- **CSS3 is on its way**
- **CSSs provide the means to control and change presentation of HTML documents**
- **CSS is not technically HTML, but can be embedded in HTML documents**
- **Style sheets allow you to impose a standard style on a whole document, or even a whole collection of documents**
- **Style is specified for a tag by the values of its properties**

3.2 Levels of Style Sheets

- **There are three levels of style sheets**
  - **Inline - specified for a specific occurrence of a tag and apply only to that tag**
    – This is fine-grain style, which defeats the purpose of style sheets - uniform style
  - **Document-level style sheets - apply to the whole document in which they appear**
  - **External style sheets - can be applied to any number of documents**
- **When more than one style sheet applies to a specific tag in a document, the lowest level style sheet has precedence**
  - **In a sense, the browser searches for a style property spec, starting with inline, until it finds one (or there isn't one)**

3.2 Levels of Style Sheets (continued)

- **Inline style sheets appear in the tag itself**
- **Document-level style sheets appear in the head of the document**
- **External style sheets are in separate files, potentially on any server on the Internet**
  - **Written as text files with the MIME type `text/css`**

3.2 Linking an External Stylesheet

- A `<link>` tag is used to specify that the browser is to fetch and use an external style sheet file

```
<link rel = "stylesheet"   type = "text/css"
 href = "http://www.wherever.org/termpaper.css">
</link>
```

- External style sheets can be validated

```
http://jigsaw.w3.org/css-validator/
              validator-upload.html
```

3.3 Style Specification Formats

- **Format depends on the level of the style sheet**
- **Inline:**
  - Style sheet appears as the value of the `style` attribute
  - General form:
    ```
    style = "property_1: value_1;
             property_2: value_2;
             …
             property_n: value_n"
    ```

3.3 Format for Document-level

- **Style sheet appears as a list of rules that are the content of a `<style>` tag**
- **The `<style>` tag must include the `type` attribute, set to `"text/css"`**
- **The list of rules must be placed in an HTML comment, because it is <u>not</u> HTML**
- **Comments in the rule list must have a different form - use C comments (`/*…*/`)**

3.3 General Form, Document Level

- **General form:**

  ```
  <style type = "text/css">
   <!--
      rule list
   -->
  </style>
  ```

- **Form of the rules:**
  selector {list of property/values}
  - **Each property/value pair has the form:**
    property: value
  - **Pairs are separated by semicolons, just as in the value of a `<style>` tag**

8

3.3 General Form, External style sheets

- **Form is a list of style rules, as in the content of a `<style>` tag for document-level style sheets**

3.4 Selector Forms: Simple

- **The selector is a tag name or a list of tag names, separated by commas**
  - `h1, h3 {font-size: 24}`
  - `P {font-size: 20}`

- *Contextual selectors*
  - `ol ol ol {list-style-type: decimal}`

3.4 Class Selectors

- **Used to allow different occurrences of the same tag to use different style specifications**

- **A style class has a name, which is attached to a tag name**
  - `p.narrow` **{property/value list}**
  - `p.wide` **{property/value list}**

- **The class you want on a particular occurrence of a tag is specified with the `class` attribute of the tag**

- ```
  <p class = "narrow">
  ...
  </p>
  ...
  <p class = "wide">
  ...
  </p>
  ```

3.4 Generic Selectors

- A generic class can be defined if you want a style to apply to more than one kind of tag

- A generic class must be named, and the name must begin with a period

- Example,

```
.really-big { … }
```

- Use it as if it were a normal style class

```
<h1 class = "really-big"> … </h1>

...

<p class = "really-big"> … </p>
```

3.4 `id` *Selectors*

- **An `id` selector allow the application of a style to one specific element**
- **General form:**

  #specific-id {property-value list}

- **Example:**

  #section14 {font-size: 20}

13

3.4 Pseudo Classes

- **Pseudo classes are styles that apply when something happens, rather than because the target element simply exists**
- **Names begin with colons**
- `hover` **classes apply when the mouse cursor is over the element**
- `focus` **classes apply when an element has focus**

3.4 Pseudo Class Example

```
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Checkboxes </title>
    <style type = "text/css">
      input:hover {color: red;}
      input:focus {color: green;}
    </style>
  </head>
  <body>
    <form action = "">
      <p>
        Your name:
        <input type = "text" />
      </p>
    </form>
  </body>
</html>
```

3.5 Properties

- **There are 60 different properties in 7 categories:**
  - **Fonts**
  - **Lists**
  - **Alignment of text**
  - **Margins**
  - **Colors**
  - **Backgrounds**
  - **Borders**

3.5 Property Values

- Keywords - left, small, …(Not case sensitive)
- Length - numbers, maybe with decimal points; Units:
  - px - pixels
  - in - inches
  - cm - centimeters
  - mm - millimeters
  - pt - points
  - pc - picas (12 points)
  - em - height of the letter 'm'
  - ex-height - height of the letter 'x'
  - No space is allowed between the number and the unit specification e.g., 1.5 in is illegal!

3.5 Property Value Forms (continued)

- **Percentage - just a number followed immediately by a percent sign**
- **URL values**
  - **url(protocol://server/pathname)**
- **Colors**
  - **Color name**
  - **rgb(n1, n2, n3)**
    - **Numbers can be decimal or percentages**
  - **Hex form: #XXXXXX**
- **Property values are inherited by all nested tags, unless overridden**

3.6 Font Properties

- **Font-family**
  - **Value is a list of font names - browser uses the first in the list it has**
    - **font-family: Arial, Helvetica, Courier**
  - **Generic fonts: serif, sans-serif, cursive, fantasy, and monospace (defined in CSS)**
    - **Browser has a specific font for each**
  - **If a font name has more than one word, it should be single-quoted**

Table 3.1 Generic fonts

Generic Name	Examples
serif	Times New Roman, Garamond
sans-serif	MS Arial, Helvetica
cursive	Caflisch Script, Zapf-Chancery
fantasy	Critter, Cottonwood
monospace	Courier, Prestige

3.6 Font Properties (continued)

- `font-size`
  - **Possible values: a length number or a name, such as `smaller`, `xx-large`, etc.**
- `font-style`
  - `italic`, `oblique` **(useless)**, `normal`
- `font-weight` **- degrees of boldness**
  - `bolder`, `lighter`, `bold`, `normal`
  - **Could specify as a multiple of 100 (100 – 900)**
- `font`
  - **For specifying a list of font properties**

  `font: bolder 14pt Arial Helvetica`
  - **Order must be: style, weight, size, name(s)**

Figure 3.1 Display of `fonts.html`

3.6 Font Properties (continued)

- **The `text-decoration` property**
  - `line-through, overline, underline, none`
  - `letter-spacing` **– value is any length property value**

This illustrates line-through

This illustrates overline

This illustrates underline

3.6 List Properties

3.7 *List properties*

- `list-style-type`
- *Unordered lists*
  - Bullet can be a disc (default), a square, or a circle
  - Set it on either the `<ul>` or `<li>` tag
    - On `<ul>`, it applies to list items

```
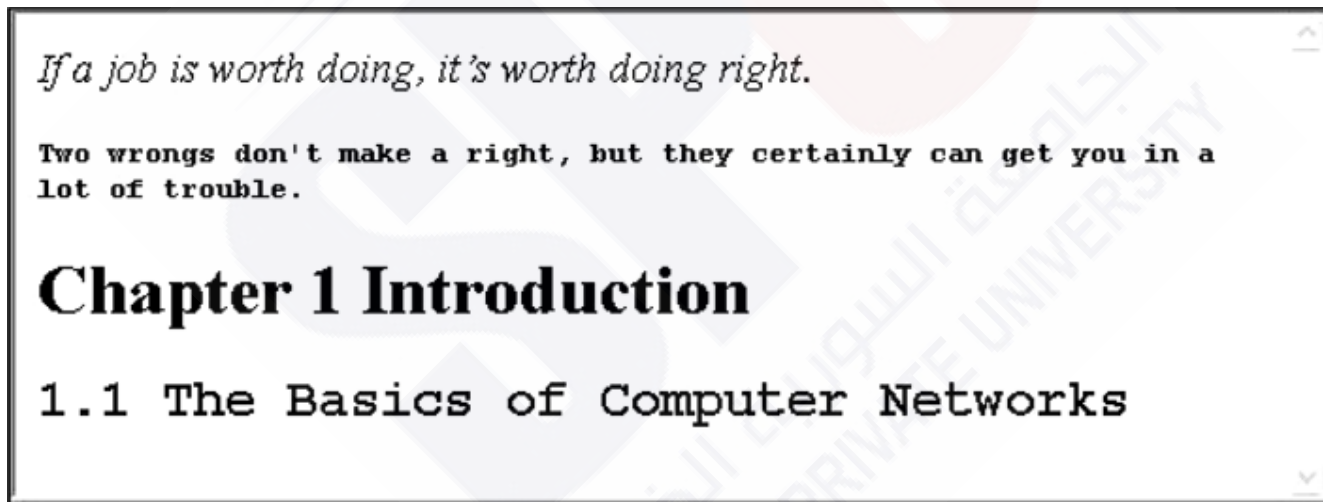<h3> Some Common Single-Engine Aircraft </h3>
  <ul style = "list-style-type: square">
      <li> Cessna Skyhawk </li>
      <li> Beechcraft Bonanza </li>
      <li> Piper Cherokee </li>
  </ul>
```

3.7 *List properties* (continued)

- **On `<li>`, `list-style-type` applies to just that item**

```
<h3> Some Common Single-Engine Aircraft </h3>
 <ul>
     <li style = "list-style-type: disc">
          Cessna Skyhawk </li>
     <li style = "list-style-type: square">
          Beechcraft Bonanza </li>
     <li style = "list-style-type: circle">
          Piper Cherokee </li>
 </ul>
```

Figure 3.3 Examples of unordered lists

Some Common Single-Engine Aircraft

- Cessna Skyhawk
- Beechcraft Bonanza
- Piper Cherokee

Some Common Single-Engine Aircraft

- Cessna Skyhawk
- Beechcraft Bonanza
- Piper Cherokee

3.7 *List properties* (continued)

- – **Could use an image for the bullets in an unordered list`<li style = "list-style-image: url(bird.jpg)">`**
- – ***On ordered lists*** **- `list-style-type` can be used to change the sequence values**
- **CSS2 has more, like `lower-greek`**

Table 3.2 Possible sequencing values for ordered lists

Property Values	Sequence Type	First Four Values
decimal	Arabic numerals	1, 2, 3, 4
upper-alpha	Uppercase letters	A, B, C, D
lower-alpha	Lowercase letters	a, b, c, d
upper-roman	Uppercase Roman numerals	I, II, III, IV
lower-roman	Lowercase Roman numerals	i, ii, iii, iv

Figure 3.4 Display of `sequence_types.html`

Aircraft Types

   I. General Aviation (piston-driven engines)
- A. Single-Engine Aircraft
  1. Tail wheel
  2. Tricycle
- B. Dual-Engine Aircraft
  1. Wing-mounted engines
  2. Push-pull fuselage-mounted engines

  II. Commercial Aviation (jet engines)
- A. Dual-Engine
  1. Wing-mounted engines
  2. Fuselage-mounted engines
- B. Tri-Engine
  1. Third engine in vertical stabilizer
  2. Third engine in fuselage

3.8 *Colors*

- ***Color is a problem for the Web for two reasons**:*
  1. **Monitors vary widely**
  2. **Browsers vary widely**
- ***There are three color collections***
  1. **There is a set of 16 colors that are guaranteed to be displayable by all graphical browsers on all color monitors**
  2. **There is a much larger set, the Web Palette**
  - **216 colors**
  - **Use hex color values of `00, 33, 66, 99, CC,` and `FF`**
  - **Inside back cover of this book has them!**

Table 3.3 Named colors

Name	Hexadecimal Code	Name	Hexadecimal Code
black	000000	green	008000
silver	C0C0C0	lime	00FF00
gray	808080	olive	808000
white	FFFFFF	yellow	FFFF00
maroon	800000	navy	000080
red	FF0000	blue	0000FF
purple	800080	teal	008080
fuchsia	FF00FF	aqua	00FFFF

3.8 *Colors* (continued)

- **The `color` property specifies the foreground color of elements**

```
<style type = "text/css">
   th.red {color: red}
   th.orange {color: orange}
</style>
…
<table border = "5">
   <tr>
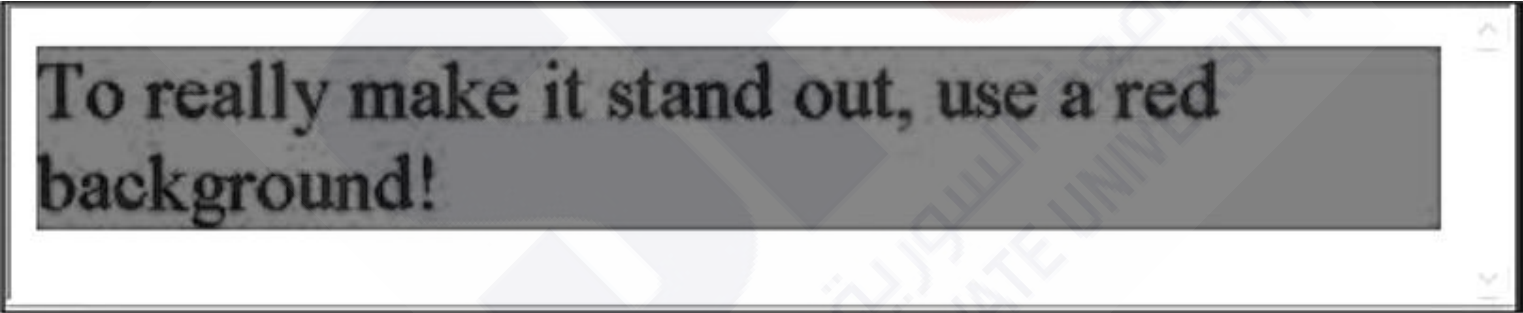      <th class = "red"> Apple </th>
      <th class = "orange"> Orange </th>
      <th class = "orange"> Screwdriver </th>
   </tr>
</table>
```

- **The `background-color` property specifies the background color of elements**

3.8 Background Color

- **The `background-color` property specifies the background color of elements**

To really make it stand out, use a red background!

3.9 Alignment of Text

- **The `text-indent` property allows indentation**
  - **Takes either a length or a % value**
- **The `text-align` property has the possible values, `left` (the default), `center`, `right`, or `justify`**
- **Sometimes we want text to flow around another element - the `float` property**
  - **The `float` property has the possible values, `left`, `right`, and `none` (the default)**
  - **If we have an element we want on the right, with text flowing on its left, we use the default `text-align` value (`left`) for the text and the `right` value for `float` on the element we want on the right**

```
<img src = "c210.jpg" style = "float: right" />
```

- **Some text with the default alignment - `left`**

3.10 The Box Model

- **Borders – every element has a `border-style` property**
  - **Controls whether the element has a border and if so, the style of the border**
  - **`border-style` values: `none`, `dotted`, `dashed`, and `double`**
  - **`border-width` – `thin`, `medium` (default), `thick`, or a length value in pixels**
  - **Border width can be specified for any of the four borders (e.g., `border-top-width`)**
  - **`border-color` – any color**
  - **Border color can be specified for any of the four borders (e.g., `border-top-color`)**

Figure 3.8 Borders

Fruit Juice Drinks

	Apple	Orange	Screwdriver
Breakfast	0	1	0
Lunch	1	0	0
Dinner	0	0	1

Now is the time for all good Web programmers to learn to use style sheets.

Figure 3.7 The box model
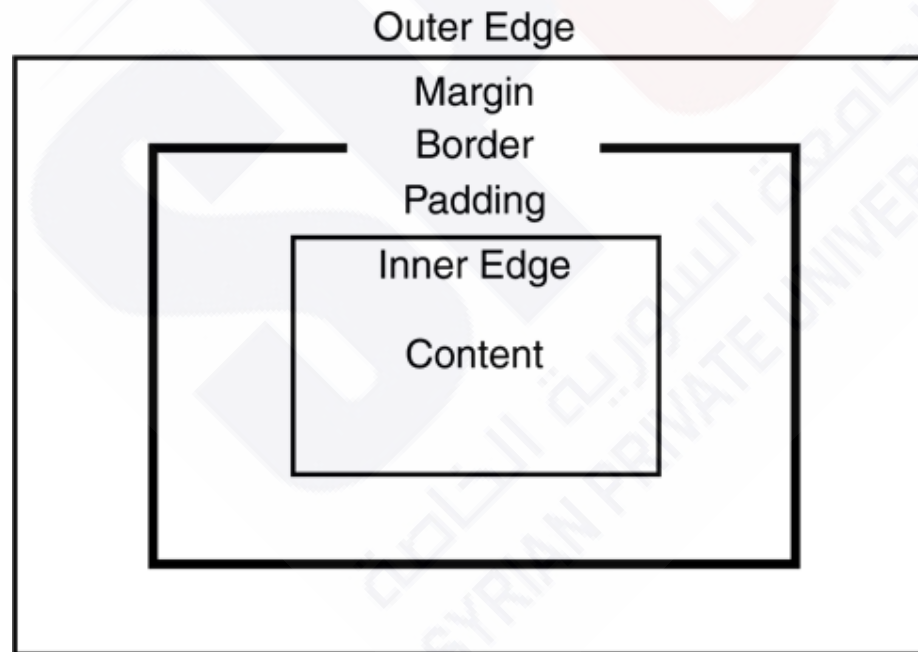
3.10 The Box Model (continued)

- **Margin – the space between the border of an element and its neighbor element**
- **The margins around an element can be set with `margin-left`, etc. - just assign them a length value**

```
<img src = "c210.jpg " style = "float: right;
   margin-left: 0.35in;
   margin-bottom: 0.35in" />
```

3.10 The Box Model (continued)

This is a picture of a Cessna 210. The 210 is the flagship single-engine Cessna aircraft. Although the 210 began as a four-place aircraft, it soon acquired a third row of seats, stretching it to a six-place plane. The 210 is classified as a high performance airplane, which means its landing gear is retractable and its engine has more than 200 horsepower. In its first model year, which was 1960, the 210 was powered by a 260 horsepower fuel-injected six-cylinder engine that displaced 471 cubic inches. The 210 is the fastest single-engine airplane ever built by Cessna.

3.10 The Box Model (continued)

- **Padding – the distance between the content of an element and its border**
  - **Controlled by `padding`, `padding-left`, etc.**

41

Figure 3.9 Display of `marpads.html`

Here is the first line.

Now is the time for all good Web programmers to learn to use style sheets. [margin = 0.2in, padding = 0.2in]

Now is the time for all good Web programmers to learn to use style sheets. [margin = 0.1in, padding = 0.3in]

Now is the time for all good Web programmers to learn to use style sheets. [margin = 0.3in, padding = 0.1in]

Now is the time for all good Web programmers to learn to use style sheets. [margin = 0.4in, no padding, no border]

Now is the time for all good Web programmers to learn to use style sheets. [padding = 0.4in, no margin, no border]

Here is the last line.

3.10 The **background-image** property

Repetition can be controlled

- **background-repeat** **property**
- **Possible values**: **repeat** **(default)**, **no-repeat**, **repeat-x**, **or** **repeat-y**
- **background-position** **property**
  - **Possible values**: **top**, **center**, **bottom**, **left**, **or** **right**

43

Figure 3.10 Display of `back_image.html`

The Cessna 172 is the most common general aviation airplane in the world. It is an all-metal, single-engine piston, high-wing four-place monoplane. It has fixed-gear and is categorized as a non-high-performance aircraft. The current model is the 172R. The wingspan of the 172R is 36'1". Its fuel capacity is 56 gallons in two tanks, one in each wing. The takeoff weight is 2,450 pounds. Its maximum useful load is 837 pounds. The maximum speed of the 172R at sea level is 142 mph. The plane is powered by a 360 cubic inch gasoline engine that develops 160 horsepower. The climb rate of the 172R at sea level is 720 feet per minute.

3.12 The `<span>` and `<div>` tags

- The default meaning of `<span>` is to leave the content as it is

  ```
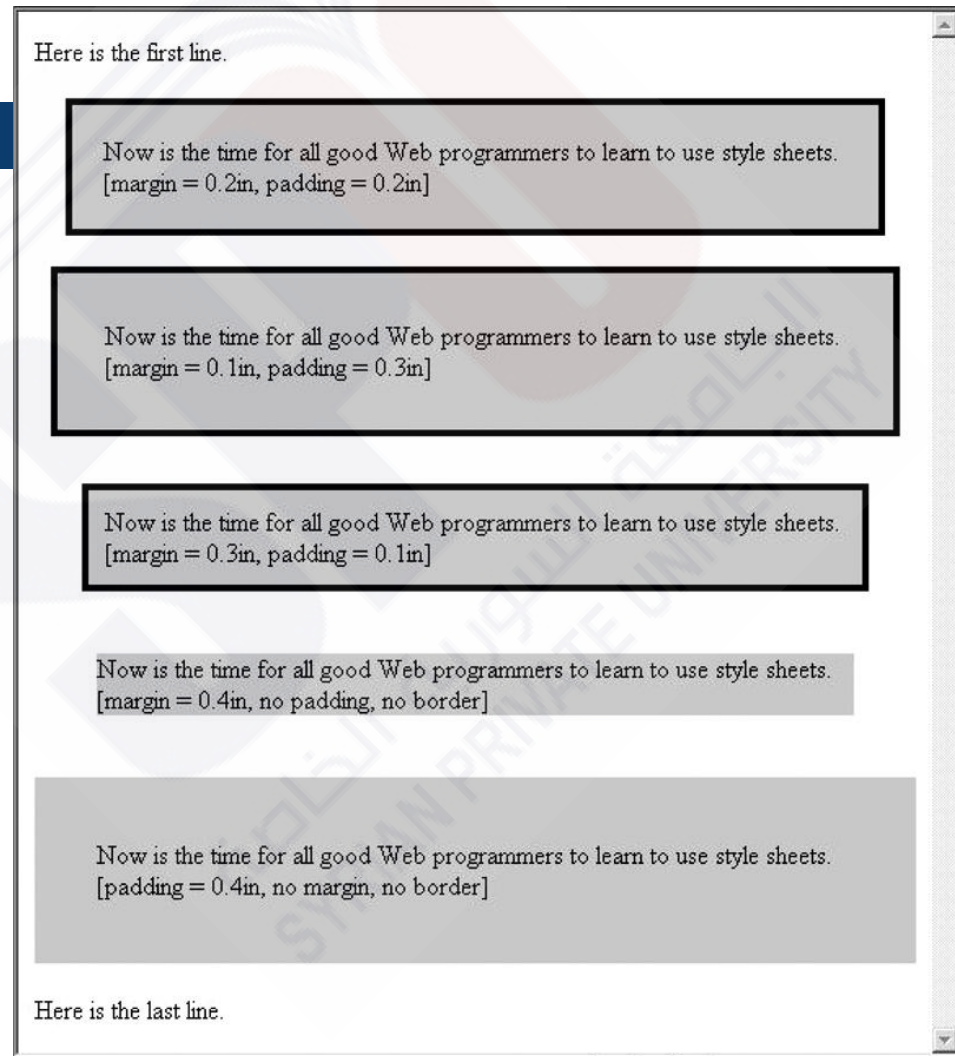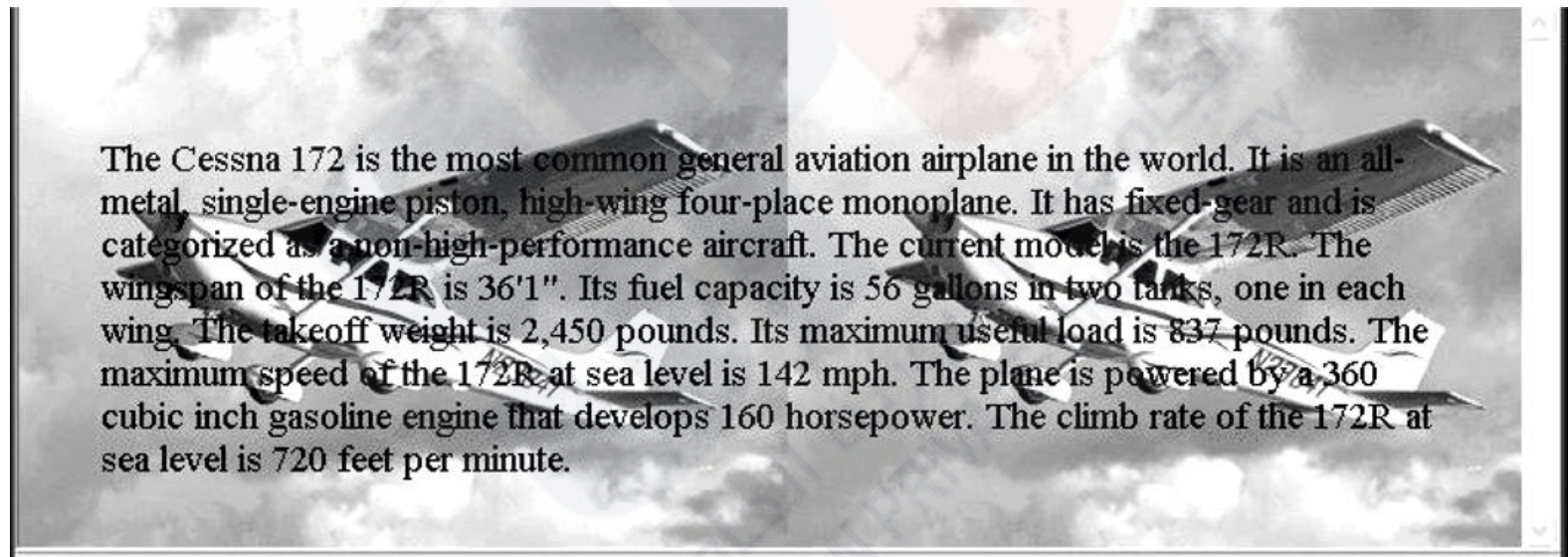  <p> Now is the <span> best time </span> ever! </p>
  ```

- Use `<span>` to apply a document style sheet to its content

  ```
  <style type = "text/css">?
     bigred {font-size: 24pt;
             font-family: Ariel; color: red}
  </style>
  <p> Now is the <span class = "bigred">
     best time </span> ever!
  </p>
  ```


45
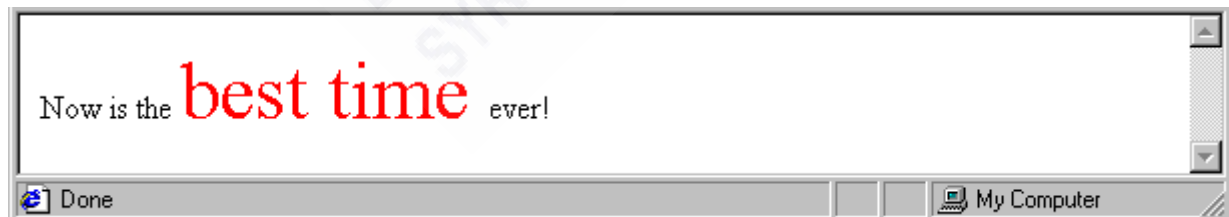
3.12 The `<span>` and `<div>` tags (continued)

- The `<span>` tag is similar to other HTML tags, they can be nested and they have `id` and `class` attributes
- Another tag that is useful for style specifications: `<div>`
  - Used to create document sections (or divisions) for which style can be specified
  - e.g., A section of five paragraphs for which you want some particular style

3.13 Conflict Resolution

- When two or more rules apply to the same tag there are rules for deciding which rule applies
- Document level
  - In-line style sheets have precedence over document style sheets
  - Document style sheets have precedence over external style sheets
- Within the same level there can be conflicts
  - A tag may be used twice as a selector
  - A tag may inherit a property and also be used as a selector
- Style sheets can have different sources
  - The author of a document may specify styles
  - The user, through browser settings, may specify styles
- Individual properties can be specified as important

47

3.13 Precedence Rules

- From highest to lowest
1. Important declarations with user origin
2. Important declarations with author origin
3. Normal declarations with author origin
4. Normal declarations with user origin
5. Any declarations with browser (or other user agent) origin

3.13 Tie-Breakers

- Specificity
    1. id selectors
    2. Class and pseudo-class selectors
    3. Contextual selectors
    4. General selectors
- Position
    - Essentially, later has precedence over earlier

49