CIS 4004: Web Based Information Technology
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Cascading Style Sheets – Page Layout – Part 1

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CSS Page Layout Overview

• As we saw in the introductory notes, CSS is used to separate content from presentation in Web documents.

• CSS is also used to separate the presentation (fonts, colors, and so on) from the page structure.

• Using CSS results in smaller Web page documents (HTML5 files), which saves on bandwidth and eases Web site maintenance.
Advantages of Using CSS For Page Layout

- When CSS is used to configure page layout in addition to formatting, all the following advantages of using CSS for formatting are enhanced:
  - **Greater typography control.** This includes font size, line spacing, letter spacing, indents, margins, and element positioning without using tables.
  - **Style is separate from structure.** The formatting and page layout can be configured and stored separately from the content section of the Web page document. When the styles are modified, the HTML remains intact. This means that if your client decides to change something as small as the background color or as potentially huge as the page layout, you may need to only change one file that contains the styles, instead of each Web page document.
  - **Potentially smaller documents.** Since both the formatting and page layout are separate from the document, the actual HTML documents should be smaller.
  - **Easier site maintenance.** Again, if the styles or page layout need to be changed it may be possible to complete the modifications by changing only a single file – the style sheet.
Advantages of Using CSS For Page Layout (cont.)

– **Increased page layout control.** CSS used in conjunction with modern standards-compliant browsers provides a variety of positioning options (even down to the pixel level) along with an ability to overlap elements. This gives the Web developer more control over the layout compared to the traditional use of tables.

– **Increased accessibility.** Pages designed using tables for layout are easy to view with a traditional browser but can be very tedious when using a screen reader or other assistive technology. By reserving the use of tables for their intended purpose of organizing tabular information and using CSS for page layout – the pages become more accessible.

– **Ability to define styles for multiple media types.** Since presentation is separated from content, CSS can be used to set a separate style for printing, or possible use of a screen reader.

– **Support of the Semantic Web.** This is the W3C’s vision of what the future Internet. In the semantic web information will have well-defined meaning that will better enable computers and humans to work in cooperation. A big step in this direction is using HTML5 syntax and using CSS3 to separate styles from structure.
Disadvantages of Using CSS For Page Layout

- There are only a couple of disadvantages of using CSS3:

  - Lack of support by older browsers. Older browsers do not support CSS3, so for example, if you are developing an intranet site for a company that has standardized on Netscape 4.7 for their desktop, none of the advantages of CSS3 would be realized and it would be better to design the site using tables for the page layout. Note that as time passes, this will become less and less of a disadvantage to the use of CSS3.

  - Productivity drop. Developers who are already proficient at developing Web pages using tables for the layout will see productivity drop (temporarily) as they learn about CSS3 techniques and properties.
The CSS Box Model

- The CSS Box Model is a crucial building block of CSS.

- Each element in a document is considered to be a rectangular box, as shown below. This box consists of a content area surrounded by padding, a border, and margins.

![CSS Box Model Diagram]
The CSS Box Model

- **Content.** The content area can consist of a combination of text and Web page elements such as images, paragraphs, headings, lists, and so on. The screen shots on the next page show `<div>` elements containing text content. The visible width of the element on a Web page is the total of the content width, the padding width, and the border width.

- **Padding.** Padding is an area that is between the content and the border. The default padding value is 0. When configuring the background of an element, the background is applied to both the padding and the content area.

- **Border.** The border area is between the padding and the margin. The default border has a value of 0 and does not display.

- **Margin.** The margin determines the empty space between the element and any adjacent elements. The margin is always transparent. The solid line shown on the previous page that contains the margin area does not display on a Web page. Keep in mind that browsers often have default margin values set of the Web page document and for certain elements such as paragraphs, headings, forms, and so on. Use the margin property to override the default browser values.
The border property is set for every element in the document.
Every element is now shown in its corresponding “box”. Notice that even the span element is individually boxed as is the entire body of the document.
The CSS Box Model

This is the first box.

This is the second box.

This is the outer box.

This is the inner box.
Box Model – Example 1

<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8" />
  <title>CSS Box Model - Number 1</title>
  <style type="text/css">
    .box1 { width:200px; 
          height:200px; 
          background-color:#cccccc; 
          border:dashed; 
          padding:5px; 
    }
    .box2 { width:100px; 
            height:100px; 
            background-color:#ffffff; 
            border: ridge; 
            padding:5px; 
            margin:10px; 
    }
  </style>
</head>
<body>
  
  <div class="box1">
    This is the first box.
  </div>

  <div class="box2">
    This is the second box.
  </div>
</body>
</html>

Note that the first <div> element ends before the second <div> element begins.

Embedded style sheet
Box Model – Example 2

Note that the style sheet is exactly the same as for the first example. The page layout is quite a bit different from the first page’s layout, but exactly the same CSS was used.

Embedded style sheet

Note that the first `<div>` element encompasses the second `<div>` element.
CSS Positioning Properties

• The box examples on the previous pages illustrate how normal flow causes the browser to render the elements in the order that they appear in the HTML5 source code.

• When using CSS for page layout there are times when you will want to specify the location of an element on the page – either the absolute pixel location, the location relative to where the element would normally display, or floating on the page.

• There may even be times when you will want to modify the way an element displays or cause an element to appear partially or completely over another element.
Relative and Absolute Positioning

- **Relative positioning** is used to change the location of an element slightly, relative to where it would otherwise appear in normal flow.

- **Use the** `position: relative` **property along with either a** `left`, `right`, `top` **and/or** `bottom` **property.**
  
  - The `left` property configures the position of the element in relation to the left side of the browser window.
  
  - The `right` property configures the position of the element in relation to the right side of the browser window.
  
  - The `top` property configures the position of the element in relation to the top of the document area in the browser window.
  
  - The `bottom` property configures the position of the element in relation to the bottom of the document area in the browser window.
Relative Positioning

The position for this id is set as relative with the left side to begin 40px from the left margin. The screen shots on the next page illustrate three different version of this markup, with 40px, 100px, and 200px indents.
Relative Positioning

This paragraph uses CSS relative positioning to be placed 40 pixels in on the left side.

Relative Positioning

This paragraph uses CSS relative positioning to be placed 100 pixels in on the left side.

Relative Positioning

This paragraph uses CSS relative positioning to be placed 200 pixels in on the left side.
Relative and Absolute Positioning

• **Absolute positioning** is used to specify the location of an element precisely in a browser window.

• Use the `position: absolute` property along with either a `left`, `right`, `top`, and/or `bottom` property need to configure the placement.
  
  – The `left` property configures the position of the element in relation to the left side of the browser window.
  
  – The `right` property configures the position of the element in relation to the right side of the browser window.
  
  – The `top` property configures the position of the element in relation to the top of the document area in the browser window.
  
  – The `bottom` property configures the position of the element in relation to the bottom of the document area in the browser window.
Absolute Positioning

The position for this id is set as absolute with the left side to begin 200px from the left margin, the top at 100px down and a width of 300px.
Absolute Positioning

This paragraph is contained in a `<div>` which uses CSS absolute positioning to be placed 200 pixels in from the left and 100 pixels down from the top of the browser window. A width of 300 pixels is also configured.
The position for this id is set as absolute with the left side to begin 50px from the left margin, the top at 300px down and a width of 200px.
Absolute Positioning

This paragraph is contained in a `<div>` which uses CSS absolute positioning to be placed 50 pixels in from the left and 300 pixels down from the top of the browser window. A width of 200 pixels is also configured.
Absolute Positioning

The position for this id is set as absolute with the right side to begin 50px from the left margin, the top at 300px down and a width of 200px.

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <title>CSS - Absolute Positioning - Version 2</title>
  <style type="text/css">
    h1 { background-color: #cccccc;
        padding: 5px;
        color: #000000;
    }
    #content { position: absolute;
        right: 50px;
        top: 300px;
        font-family: Arial, sans-serif;
        width: 200px;
    }
  </style>
</head>
<body>
<h1>Absolute Positioning</h1>
<div id="content">
  <p>This paragraph is contained in a <span style="font-family: courier">&lt;div&gt;</span>
  which uses CSS absolute positioning to be placed 50 pixels in from the right and
  300 pixels down from the top of the browser window. A width of 200 pixels is
  also configured.
</p>
</div>
</body>
</html>
```
Absolute Positioning

This paragraph is contained in a `<div>` which uses CSS absolute positioning to be placed 50 pixels in from the right and 300 pixels down from the top of the browser window. A width of 200 pixels is also configured.
More On Absolute Positioning

• When working with absolute positioning it is important to be aware that elements not absolutely positioned will be rendered using normal flow by the browser.

• Elements that are absolutely positioned are rendered outside of normal flow.

• Consider the example shown on the next page.
Will the paragraph display above the list or to the right of the list?
More On Absolute Positioning

The paragraph was set at an absolute position and thus rendered outside of the normal flow. So, the paragraph will appear to the right of the list. Even though the list was coded in the HTML after the paragraph.

Millennium Technologies

- Home
- About
- Services

Our professional staff takes pride in its working relationship with our clients by offering personalized services that listen to their needs, develop their target areas, and incorporate these items into a well-presented web site that works.
More On Absolute Positioning

Here’s what happens when the class **content** was set to have a left position set at 40 pixels and a top position set also set at 40 pixels.

As you can see, the absolutely positioned element overlaps the list element which was positioned in normal flow.
More On Absolute Positioning

Our professional staff takes pride in its work. We listen to our clients offering personalized services that listen to their needs, develop their target areas, and incorporate these items into a well-presented website that works.

Here’s what happens when the class content was set to have a left position set at 0 pixels and a top position set also set at 0 pixels.

As you can see, the absolutely positioned element overlaps all of the elements that were positioned using normal flow.
The \texttt{float} Property

- Elements that seem to float on the right or left side of either the browser window or another element are often configured using the \texttt{float} property.

- The browser renders these element using normal flow, and then shifts them as far as possible within their container (usually either the browser window or a \texttt{<div>}) to either the right or left. Other content will flow around the float. \textbf{Elements can be floated only left or right, not up or down.}

- To stop this flow, use the \texttt{clear} property.
The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium.

If we make this paragraph even larger, will it begin to wrap around the bottom of the image or will it continue to end at the left margin of the image? We'll see what happens in the next version!

Shorthand notation: order is always – top, right, bottom, left. Any 0 value does not need units.
The **float** Property

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**Floating an Image**

The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium.

If we make this paragraph even larger, will it begin to wrap around the bottom of the image or will it continue to end at the left margin of the image? We'll see what happens in the next version!
Change to left float. Set margins of 5 pixels on bottom and left side.
Notice that the picture was set with a left margin of 5px, so we see some of the gray background for the header. Let's reset the margins and see what happens.
<!DOCTYPE html>
<html lang="en">
<head>
    <title>CSS Float Property - Example 1 - Version 3</title>
    <style type="text/css">
        h1 { background-color:#cccccc; padding:5px; color: #000000; }
        p { font-family:Arial,sans-serif; }
        .10left { padding:10px; font-family:Arial, sans-serif; }
        #picture {float:left; margin: 0 0 5px 0; border: solid; }
    </style>
</head>
<body>
    <p><img id="picture" src="boonen.jpg" alt="Tom Boonen" height="300" width="300" /></p>
    <h1>Floating an Image</h1>
    <p class="10left">The heading and paragraph follow normal flow. The racer pictured on the right is Beglian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium. T</p>
    <p>If we make this paragraph even larger, will it begin to wrap around the bottom of the image or will it continue to end at the left margin of the image? We'll see what happens in the next version!</p>
</body>
</html>
Floating an Image

The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium. If we make this paragraph even larger, will it begin to wrap around the bottom of the image or will it continue to end at the left margin of the image? We’ll see what happens in the next version!

Image and background now flush on left margin.

If the paragraph is longer than this one, does the additional text continue to line up as it currently does or will it move over under the image to continue?
Floating an Image

The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium.

If we make this paragraph even larger, will it begin to wrap around the bottom of the image or will it continue to end at the left margin of the image? We'll see what happens! This line is repeated many times. This line is repeated many times. This line is repeated many times. This line is repeated many times. This line is repeated many times. This line is repeated many times. This line is repeated many times. This line is repeated many times.
Added a clear property to the rule for the paragraph style.
The paragraph has cleared the element on its right side. Notice that no clear property was associated with the `<h1>` element and it does not clear the image.

The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen. He is one of the top professional cyclists in the world. Once again this year Tom will ride for the Quick-Step team based in Belgium.
With `clear:right` property on both the `<p>` and `<h1>` styles, both of these elements now clear the image, even though it appeared first in the markup.

Floating an Image

The heading and paragraph follow normal flow. The racer pictured on the right is Belgian Tom Boonen.
clear:right property on both the <p> and <h1> styles.

But, the <h1> element now appears in the markup before the <img> element. What do you think the rendering will look like?
Since the `<h1>` element is in normal flow and appears in the markup before the `<img>` element, it has nothing to clear and thus the property has no effect in this case.
Practice Problems

1. Experiment with the CSS box model and the absolute positioning property to produce a webpage that looks similar to the one shown on the next page. All of these boxes were rendered using absolute positioning, none were rendered in normal flow. Also experiment with allowing the boxes to be positioned using normal flow and rearrange their order of appearance in the HTML markup and notice how the rendering differs. Then experiment with a mixture of absolute positioning and normal flow and see what happens to the rendering.
Playing Around With The CSS Box Model
Practice Problems

2. Experiment with the CSS box model and the absolute positioning property to produce a webpage that looks similar to the one shown on the next page. All of these boxes were rendered using absolute positioning, none were rendered in normal flow. Also experiment with allowing the boxes to be positioned using normal flow and rearrange their order of appearance in the HTML markup and notice how the rendering differs. Then experiment with a mixture of absolute positioning and normal flow and see what happens to the rendering.

In this problem all the boxes are 100 x 100 pixels in size.

REPEAT using relative positioning!
Playing Around With The CSS Box Model
Practice Problems

3. Modify your HTML/CSS from problem 2 so that it looks like that shown on the next page. Box 10 in this case is the exact same width as the sum of all the other boxes.
Playing Around With The CSS Box Model

Box 1

Box 2

Box 3

Box 4

Box 5

Box 6

Box 7

Box 8

Box 9

Box 10