Multicolumn Page Layout

Web Development

Agenda

- The DOM, HTML Parsing & Rendering
- Formatting concepts in CSS
- A simple, worked example of multicolumn layout
- A worked example of a "tabbed" multicolumn layout

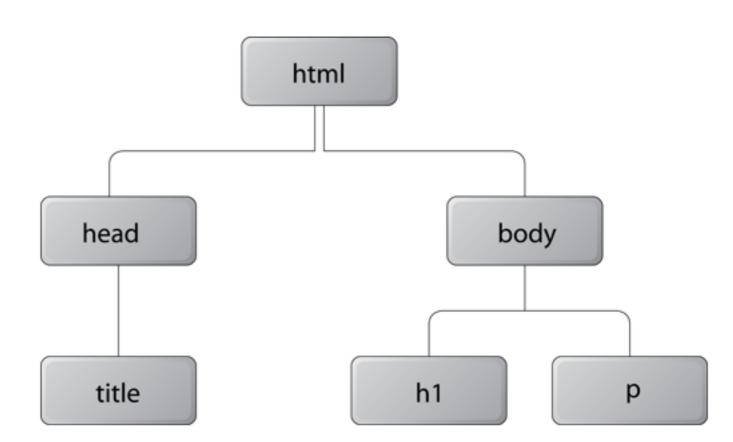
Parsing & Rendering

- A web browser typically reads and renders HTML documents in two phases:
 - the parsing phase
 - the rendering phase.
- During the parsing phase, the browser reads the markup in the document, breaks it down into components, and builds a Document Object Model (DOM) tree.
- The DOM is a in-memory data structure, typically traversed by Java Script code

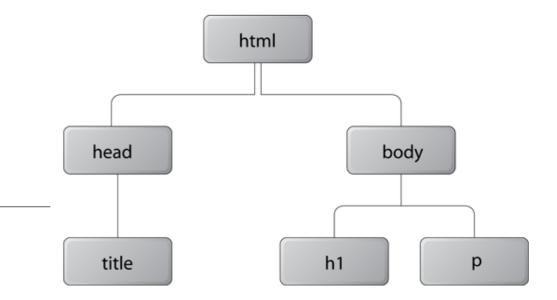
DOM Tree

- Each object in the DOM tree is called a node.
- There are several types of nodes, including element nodes and text nodes.
- At the top of the tree is a document node, which contains an element node called the root node; this is always the html element in HTML documents.
- It branches into two child element nodes—head and body—which then branch into other children.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN"
    "http://www.w3.org/TR/html4/strict.dtd">
    <html>
        <head>
            <title>Widgets</title>
            <head>
            <body>
            <h1>Widgets</h1>
            Welcome to Widgets, the number one company in the world for selling widgets!
            </body>
            <html>
```



Parents, Grandparents, Children, Grandchildren Siblings



- A child node is structurally subordinate to its parent node the child's tags are nested inside the tags of the parent.
- A node can be called a descendant node if it's a child, grandchild, and so on, of another node.
- A node can be called an ancestor node if it's a parent, grandparent, and so on, of another node.
- Nodes that have the same parent are called siblings.

Block & Inline

- When the DOM tree has been constructed, and any CSS style sheets have been loaded and parsed, the browser starts the rendering phase.
- Each node in the DOM tree will be rendered as zero or more boxes.
- A box is always rectangular, it has four sides with a 90° angle between each side.
- HTML Elements are either block-level or inline-level.
 - block-level HTML elements generate block boxes,
 - while inline-level HTML elements generate inline boxes.
- The separation into block-level and inline elements in HTML is specified in the HTML document type definition

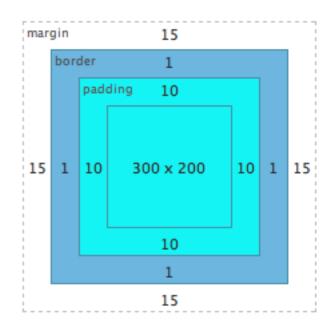
CSS Box Model

- The box model is the central mechanism for determining how an element is positioned on a web page.
- Some key concepts:
 - Box Structure
 - Calculating Box Dimensions
 - The Containing Block
 - Collapsing Margins

Box Structure

- The content area in the center, the padding around the content area, the border area, and the margin area.
- The outer edge of the content area is called the content edge or inner edge; the outer edge of the padding area is called the padding edge; the outer edge of the border area is called the border edge; and the outer edge of the margin area is called the margin edge or outer edge

```
.box
{
  width: 300px;
  height: 200px;
  padding: 10px;
  border: 1px solid #000;
  margin: 15px;
}
```



Calculating Box Dimensions

Block-level elements can only be rectangular.

 Calculate the overall dimensions of a block-level element by taking into account the height and width of the content area, as well as any margins, padding, and borders that are applied to the element.

 Define the content width of an element by declaring its width and height properties. If no declarations are applied, the default value for the width and height properties is auto.

The Containing Block

- CSS rendering comprises the tasks of laying out and rendering numerous boxes. Element boxes are positioned within a formatting context, which, by default, is provided by the box generated by a parent element.
- When we specify the positions or dimensions of element boxes, we're doing so relative to what's known as the containing block, which is a very important concept in CSS layout.
- The containing block for the root element is called the initial containing block, and has the same dimensions as the <u>viewport</u> - generally the browser window
- The containing block for other elements is generally the immediate parent

Collapsing Margins

- When the vertical margins of two elements are touching, only the margin of the element with the largest margin value will be honored, while the margin of the element with the smaller margin value will be collapsed to zero
- In this example, the gap between the elements is only 25px, and the smaller margin has collapsed to zero
- Exceptions to this rule:
 - floated elements
 - absolutely positioned elements
 - 4 other special cases....

```
h1
{
   margin: 0 0 25px 0;
   background: #cfc;
}
p
{
   margin: 20px 0 0 0;
   background: #cf9;
}
```

Heading Content

25px gap

Paragraph content

Formatting Concepts

- Layout Rules
 - Block Formatting
 - Inline Formatting
 - List Formatting
 - Table Formatting
 - Replaced Elements

- Positioning Rules
- Relative Positioning
- Absolute Positioning
- Fixed Positioning
- Stacking Contexts
- Floating & Clearing

Liquid Layout vs Fixed Layout

Liquid Layout:

- All containers on the page have their widths defined in percents.
- A liquid layout will move in and out when you resize your browser window.

Fixed Layout:

- · All containers on the page have their widths defined in pixels or other fixed units
- A fixed layout will not move in and out when you resize your browser window.

References (1)



Liquid layouts the easy way

Date: 30 December 2003 Author: Russ Weakley

This article explains one method of achieving a successful liquid layout as well as providing basic definitions of liquid, fixed-width and em-driven layouts.

Some definitions

Liquid layout

All containers on the page have their widths defined in percents – meaning that they are completely based on the <u>viewport</u> rather than the initial <u>containing</u> <u>block</u>. A liquid layout will move in and out when you resize your browser window.

<u>Liquid layout example</u>

Combination liquid and fixed layouts

Similar to liquid layouts, except one or more of the containers on the page have fixed widths.

Liquid/fixed layout example

Fixed-width layouts

All containers on the page have their widths defined in pixels or other fixed units. They are completely independent of the viewport. A fixed layout will not move in and out when you resize your browser window.

http://www.maxdesign.com.au/articles/liquid/

References (2)

- ▼ CSS Layout and Formatting The Viewport, the Page Box, and the Canvas
 - ▼ The CSS Box Model

 Containing Block

 Collapsing Margins

 The Internet

Explorer 5 Box

Model

The Internet Explorer hasLayout Property

- ▼ Formatting Concepts

 Block Formatting

 Inline Formatting

 List Formatting

 Table Formatting

 Replaced Elements
- Positioning

Relative Positioning

Absolute Positioning

Fixed Positioning

Stacking Contexts

Floating and Clearing

The Relationship Between display, position, and float

Floating and Clearing

A floated element is one whose float property has a value other than none. The element can be shifted to the left (using the value left) or to the right (using the value right); non-floated content will flow along the side opposite the specified float direction.

The floated box is shifted to the left or right until its margin edge touches the padding edge of the containing block, or the margin edge of another floated element. If the floated element is within a line box, the top of the floated box is aligned with the top of the line box. If there isn't enough horizontal room left for non-floated content to flow alongside the floated box on the current line, it's shifted down until it fits, or there are no more floated elements.



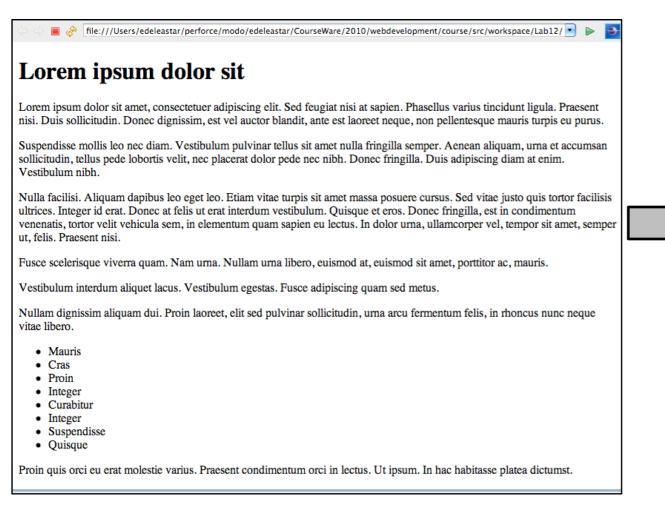
Defining the Margin Edge

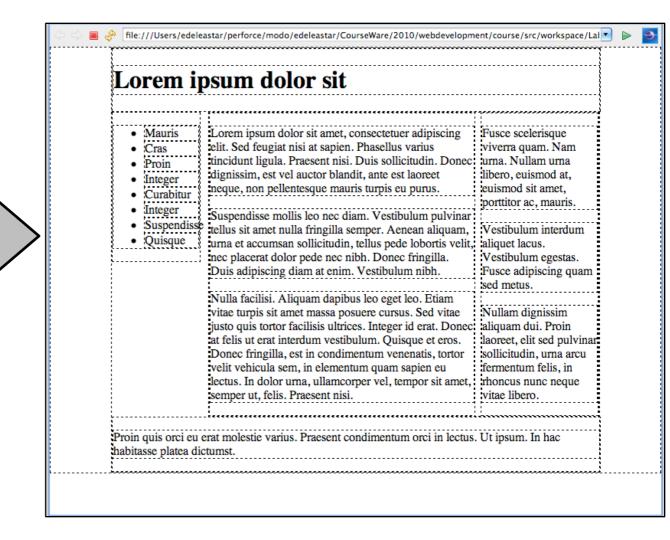
The **margin edge** of a box surrounds the margin of the box. If the box has no margins, the margin edge is the same as the border edge. See The CSS Box Model for more information.

A floated box is taken out of the flow, so it doesn't affect the block-level boxes around it. Line boxes located next to a floated box, however, are shortened to make room for the float. A containing block will not expand to accommodate a floating child box, unless the containing block is also floating, or has its overflow property set to something other than visible.

<u>Figure 1</u> shows a schematic view of the following HTML fragment, in which the image is floated to the left:

Multi-Column Layout - A Worked Example





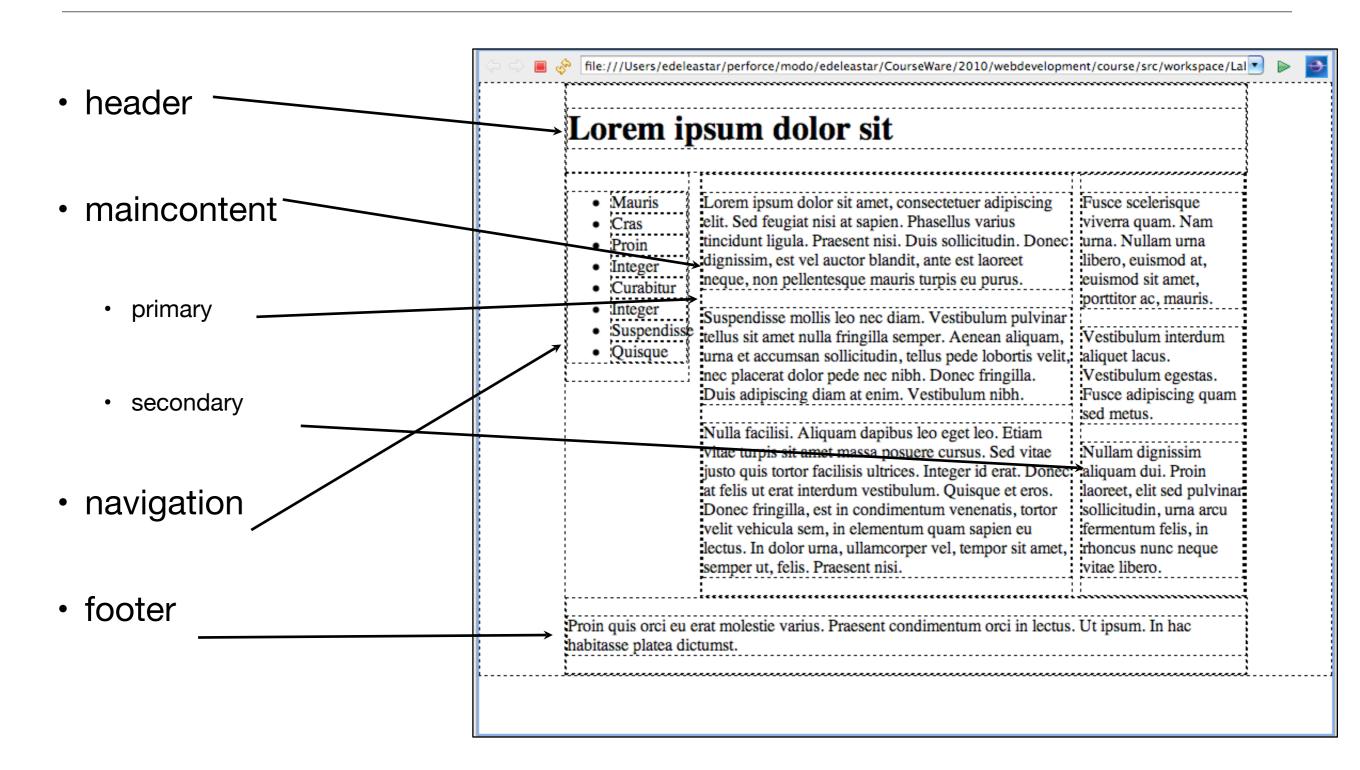
Content

- 1 <h1>
- 6 's
- 1
- 1

```
<body>
 <h1>
   Lorem ipsum dolor sit
 </h1>
  <
   Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Sed feugiat nisi
   at sapien. Phasellus varius tincidunt liqula. Praesent nisi. Duis
   sollicitudin. Donec dignissim, est vel auctor blandit, ante est laoreet
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   fringilla semper. Aenean aliquam, urna et accumsan sollicitudin, tellus
   pede lobortis velit, nec placerat dolor pede nec nibh. Donec fringilla. Duis
   adipiscing diam at enim. Vestibulum nibh.
 >
   Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet
   massa posuere cursus. Sed vitae justo quis tortor facilisis ultrices.
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   elementum quam sapien eu lectus. In dolor urna, ullamcorper vel, tempor sit
   amet, semper ut, felis. Praesent nisi.
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   euismod sit amet, porttitor ac, mauris.
 Vestibulum interdum aliquet lacus. Vestibulum egestas. Fusce adipiscing
   quam sed metus.
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   sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae
   libero.
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   Cras
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   Integer
   Curabitur
   Integer
   Suspendisse
   Quisque
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   orci in lectus. Ut ipsum. In hac habitasse platea dictumst.
 </body>
```

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Target



DIVs (1)

```
<div id="header">
    <h1>
        Lorem ipsum dolor sit
        </h1>
    </div>
```

- header
- maincontent
 - primary
 - second

```
<div id="maincontent">
  <div id="primary">
      Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Sed feugiat nisi
      at sapien. Phasellus varius tincidunt ligula. Praesent nisi. Duis
      sollicitudin. Donec dignissim, est vel auctor blandit, ante est laoreet
      neque, non pellentesque mauris turpis eu purus.
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      elementum quam sapien eu lectus. In dolor urna, ullamcorper vel, tempor sit
      amet, semper ut, felis. Praesent nisi.
    </div>
  <div id="secondary">
      Fusce scelerisque viverra quam. Nam urna. Nullam urna libero, euismod at,
      euismod sit amet, porttitor ac, mauris.
    <D>
      Vestibulum interdum aliquet lacus. Vestibulum egestas. Fusce adipiscing
      quam sed metus.
    Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar
      sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae
      libero.
    </div>
</div>
```

Divs (2)

navigation

footer

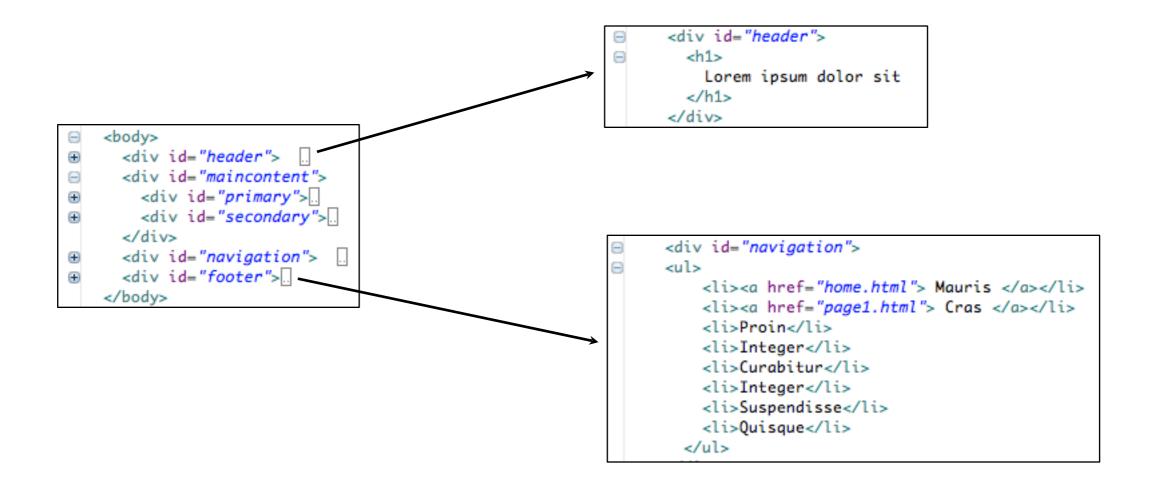
```
<div id="footer">

        Proin quis orci eu erat molestie varius. Praesent condimentum
        orci in lectus. Ut ipsum. In hac habitasse platea dictumst.

        </div>
```

Eclipse Folding View

 Eclipse Folding editor can "Expand all" or "Collapse all" of the elements, facilitating a precise focus on the elements under consideration.



Stylesheet

<link type="text/css" rel="stylesheet" href="home.css" media="screen" />

 Width of body to be 80% of "containing element" (the browser window)

```
body
{
width: 80%;
margin: 0 auto;
}
```

- No top/bottom margin for the page
- "auto" for left and right
 - i.e. the margins to be proportional to the container width and equal in size.

shortcut for...

```
body
{
    width: 80%;
    margin-top: 0;
    margin-bottom: 0;
    margin-left: auto;
    margin-right: auto;
}
```



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Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae justo quis tortor facilisis ultrices. Integer id erat. Donec at felis ut erat interdum vestibulum. Quisque et eros. Donec fringilla, est in condimentum venenatis, tortor velit vehicula sem, in elementum quam sapien eu lectus. In dolor urna, ullamcorper vel, tempor sit amet, semper ut, felis. Praesent nisi.

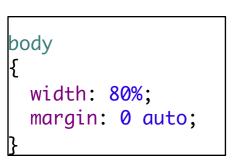
Fusce scelerisque viverra quam. Nam urna. Nullam urna libero, euismod at, euismod sit amet, porttitor ac, mauris.

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Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae libero.

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- Quisque

Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac habitasse platea dictumst.

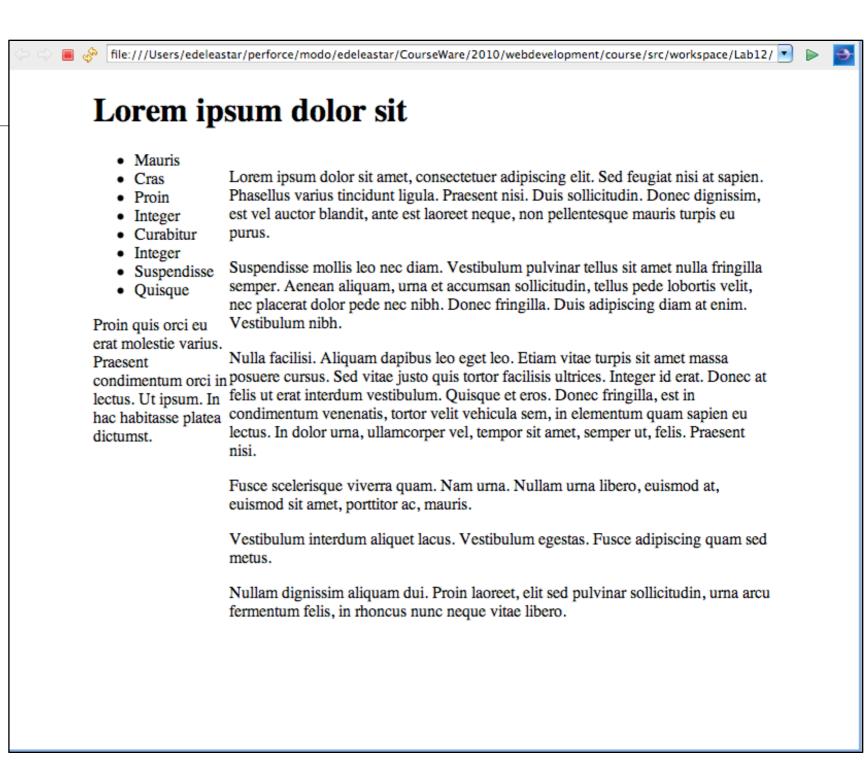


 Entire page İS positioned centered within the browser

Float

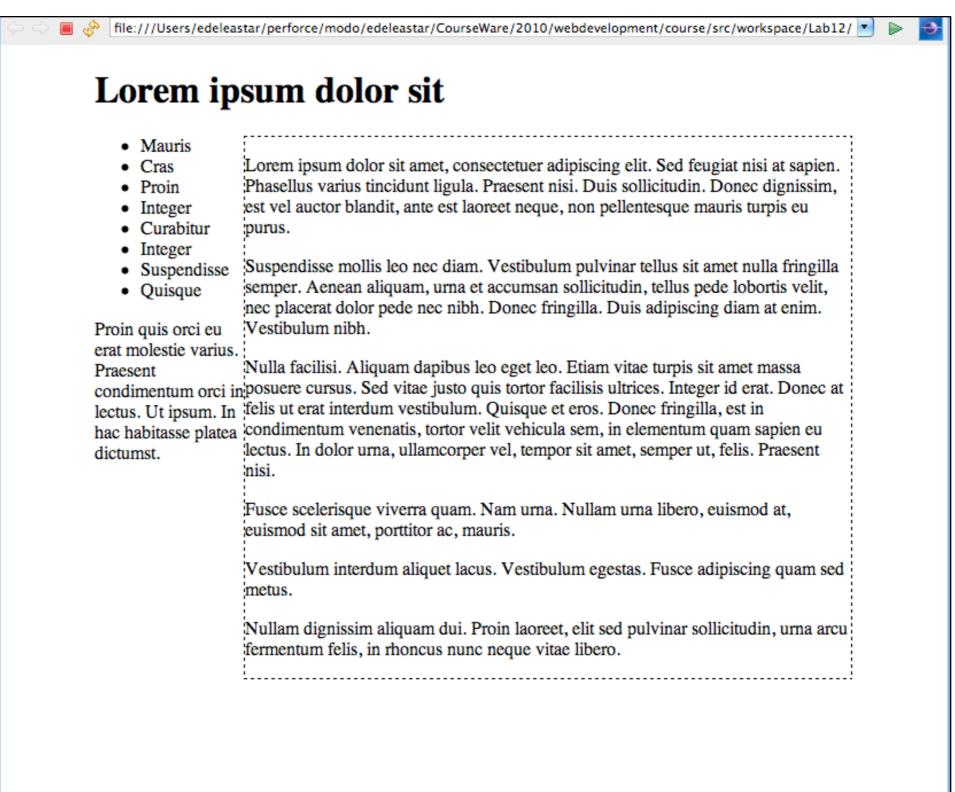
```
#maincontent
{
   width: 80%;
   float: right;
}
```

- Width of maincontent is to be 80% of it's container, which in turn is 80% of its container.
- Maincontent is a "floated" box shifted to the right until its margin edge touches the padding edge of the containing block (or the margin edge of another floated element).



Show Borders (temporarily)

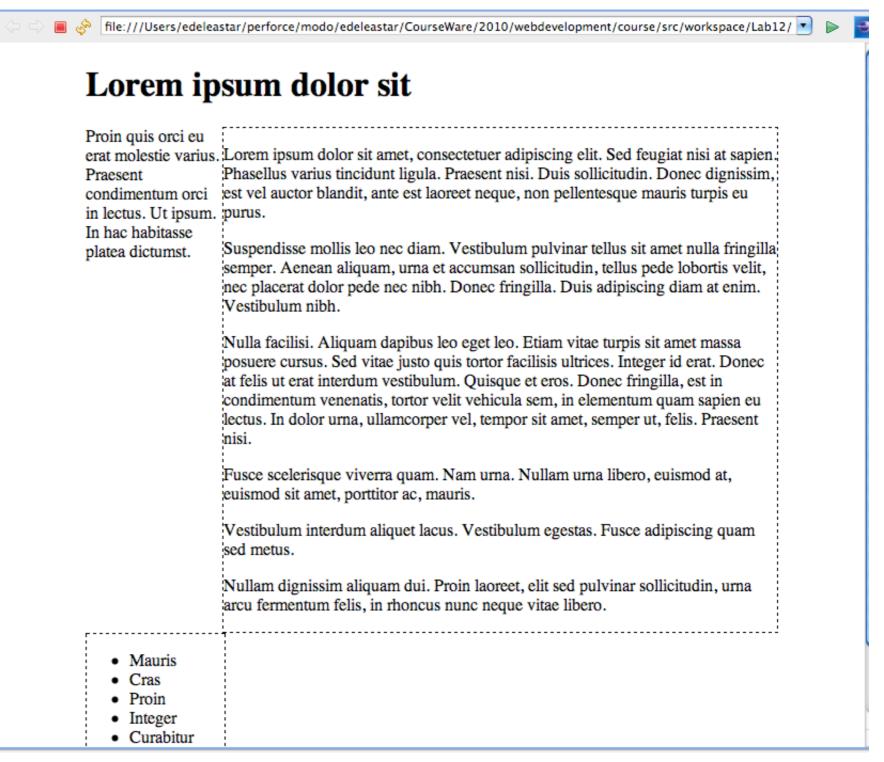
```
#maincontent
{
  width: 80%;
  float: right;
  border: dashed thin;
}
```



 Show a dashed border around the maincontent to better understand the layout behaviour

Navigation - take 1

```
#navigation
{
   width: 20%;
   float: left;
   border: dashed thin;
}
```



- Resize the navigation to be 20% of container
- Float left
- However, as width does not include padding & margins, this is too wide to fit on "row" with maincontent, so "flows" below it

Navigation

- take 2

```
#navigation
  width: 18%;
  float: left;
  border: dashed thin;
```

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Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae libero.

Reset width to 18% - now enough room for navigation & maincontent

Header & Footer

```
#header
{
    width: 100%;
    border: dashed thin;
}

#footer
{
    width: 100%;
    border: dashed thin;
}
```

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- Curabitur
- Integer
- Suspendisse
- Quisque

Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac habitasse platea dictumst.

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file:///Users/edeleastar/perforce/modo/edeleastar/CourseWare/2010/webdevelopment/course/src/workspace/Lab12/

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Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae justo quis tortor facilisis ultrices. Integer id erat. Donec at felis ut erat interdum vestibulum. Quisque et eros. Donec fringilla, est in condimentum venenatis, tortor velit vehicula sem, in elementum quam sapien eu lectus. In dolor urna, ullamcorper vel, tempor sit amet, semper ut, felis. Praesent nisi.

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Vestibulum interdum aliquet lacus. Vestibulum egestas. Fusce adipiscing quam sed metus.

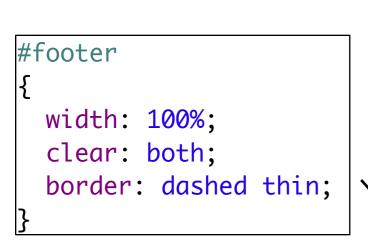
Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae libero.

- Header & Footer to be 100% of the container
- Anomalies arise footer (the text on the left) seem misplaced.
- These borders seem confused

Clear

- "clear" forces an element to start below any floated elements
- An element whose clear property is set to "left" will start below all left-floated boxes in the same block formatting context
- A clear value of "right" will clear all right-floated boxes.
- If clear is set to "both", the element will start below any floated box in that context

Footer:clear



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Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae libero.

Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac habitasse platea dictumst.

body width: 80%; margin: 0 auto; #maincontent width: 80%; float: right; border: dashed thin: #navigation width: 18%; float: left; border: dashed thin; #header width: 100%; border: dashed thin: #footer width: 100%; clear: both; border: dashed thin;

Pattern Matching Selectors

"*" matches all elements.

 Simplifies CSS, and can be removed when layout under control

```
🔳 🤡 file:///Users/edeleastar/perforce/modo/edeleastar/CourseWare/2010/webdevelopment/course/src/workspace/Lab12/WebContent/h 🔻 🕨
       Lorem ipsum dolor sit
                            Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Sed feugiat nisi at sapien.
                            Phasellus varius tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec dignissim, est vel
                            auctor blandit, ante est laoreet neque, non pellentesque mauris turpis eu purus.
            Proin
            Integer
                            Suspendisse mollis leo nec diam. Vestibulum pulvinar tellus sit amet nulla fringilla semper.
            Curabitur
                            Aenean aliquam, urna et accumsan sollicitudin, tellus pede lobortis velit, nec placerat dolor

    Integer

                            pede nec nibh. Donec fringilla. Duis adipiscing diam at enim. Vestibulum nibh.
            Suspendisse

    Quisque

                            Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere
                            cursus. Sed vitae justo quis tortor facilisis ultrices. Integer id erat. Donec at felis ut erat
                            interdum vestibulum. Quisque et eros. Donec fringilla, est in condimentum venenatis,
                            tortor velit vehicula sem, in elementum quam sapien eu lectus. In dolor urna, ullamcorper
                            vel, tempor sit amet, semper ut, felis. Praesent nisi.
                            amet, porttitor ac, mauris.
                            Vestibulum interdum aliquet lacus. Vestibulum egestas. Fusce adipiscing quam sed metus.
                            Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu
                            fermentum felis, in rhoncus nunc neque vitae libero.
```

```
border: dashed thin;
bodv
  width: 80%;
  margin: 0 auto;
#maincontent
  width: 80%;
  float: right;
#navigation
 width: 18%;
  float: left:
#header
  width: 100%;
#footer
  width: 100%;
  clear: both;
```

Primary & Secondary

```
#primary
{
    width: 68%;
    float: left;
}

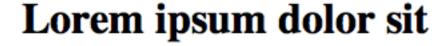
#secondary
{
    width: 30%;
    float: right;
}
```

file:///Users/edeleastar/perforce/modo/edeleastar/CourseWare/2010/webdevelopment/course/src/workspace/Lal Lorem ipsum dolor sit Mauris Lorem ipsum dolor sit amet, consectetuer adipiscing Fusce scelerisque elit. Sed feugiat nisi at sapien. Phasellus varius viverra quam. Nam Cras urna. Nullam urna tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec: Proin dignissim, est vel auctor blandit, ante est laoreet libero, euismod at, Integer neque, non pellentesque mauris turpis eu purus. euismod sit amet, Curabitur porttitor ac, mauris. Integer Suspendisse mollis leo nec diam. Vestibulum pulvinar Suspendisse tellus sit amet nulla fringilla semper. Aenean aliquam, :Vestibulum interdum Quisque urna et accumsan sollicitudin, tellus pede lobortis velit, aliquet lacus. nec placerat dolor pede nec nibh. Donec fringilla. Vestibulum egestas. Duis adipiscing diam at enim. Vestibulum nibh. Fusce adipiscing quam sed metus. Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae Nullam dignissim justo quis tortor facilisis ultrices. Integer id erat. Donec aliquam dui. Proin laoreet, elit sed pulvinar at felis ut erat interdum vestibulum. Quisque et eros. Donec fringilla, est in condimentum venenatis, tortor sollicitudin, urna arcu velit vehicula sem, in elementum quam sapien eu fermentum felis, in lectus. In dolor urna, ullamcorper vel, tempor sit amet, rhoncus nunc neque semper ut, felis. Praesent nisi. vitae libero. Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac habitasse platea dictumst.

"CSS Craftsman" #header width: 100%; file:///Users/edeleastar/perforce/modo/edeleastar/CourseWare/2010/webdevelopment/course/src/workspace/Lal #navigation Lorem ipsum dolor sit width: 18%; float: left; Mauris Lorem ipsum dolor sit amet, consectetuer adipiscing Fusce scelerisque Cras elit. Sed feugiat nisi at sapien. Phasellus varius viverra quam. Nam tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec: urna. Nullam urna Proin #maincontent dignissim, est vel auctor blandit, ante est laoreet libero, euismod at, Integer Curabitur neque, non pellentesque mauris turpis eu purus. euismod sit amet, porttitor ac, mauris. width: 80%; Suspendisse mollis leo nec diam. Vestibulum pulvinar Suspendisse tellus sit amet nulla fringilla semper. Aenean aliquam, float: right; Vestibulum interdum Quisque urna et accumsan sollicitudin, tellus pede lobortis velit, aliquet lacus. nec placerat dolor pede nec nibh. Donec fringilla. Vestibulum egestas. Duis adipiscing diam at enim, Vestibulum nibb Fusce adipiscing quam sed metus. #primary Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae Nullam dignissim width: 68%; sto quis tortor facilisis ultrices. Integer id erat. Donec: aliquam dui. Proin at felis ut erat interdum vestibulum. Quisque et eros. laoreet, elit sed pulvinar float: left; Donec fringilla, est in condimentum venenatis, tortor sollicitudin, urna arcu velit vehicula sem, in elementum quam sapien eu fermentum felis, in rhoncus nunc neque lectus. In dolor urna, ullamcorper vel, tempor sit amet, semper ut, felis. Praesent nisi. vitae libero. #secondary Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac width: 30%; habitasse platea dictumst. float: right; #footer width: 100%; clear: both;







- Mauris
- Cras
- Proin
- Integer
- Curabitur
- Integer
- Suspendisse
- Quisque

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Sed feugiat nisi at sapien. Phasellus varius tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec dignissim, est vel auctor blandit, ante est laoreet neque, non pellentesque mauris turpis eu purus.

Suspendisse mollis leo nec diam. Vestibulum pulvinar tellus sit amet nulla fringilla semper. Aenean aliquam, urna et accumsan sollicitudin, tellus pede lobortis velit, nec placerat dolor pede nec nibh. Donec fringilla. Duis adipiscing diam at enim. Vestibulum nibh.

Nulla facilisi. Aliquam dapibus leo eget leo. Etiam vitae turpis sit amet massa posuere cursus. Sed vitae justo quis tortor facilisis ultrices. Integer id erat. Donec at felis ut erat interdum vestibulum. Quisque et eros. Donec fringilla, est in condimentum venenatis, tortor velit vehicula sem, in elementum quam sapien eu lectus. In dolor urna, ullamcorper vel, tempor sit amet, semper ut, felis. Praesent nisi.

Fusce scelerisque viverra quam. Nam urna. Nullam urna libero, euismod at, euismod sit amet, porttitor ac, mauris.

Vestibulum interdum aliquet lacus. Vestibulum egestas. Fusce adipiscing quam sed metus.

Nullam dignissim aliquam dui. Proin laoreet, elit sed pulvinar sollicitudin, urna arcu fermentum felis, in rhoncus nunc neque vitae libero.

Proin quis orci eu erat molestie varius. Praesent condimentum orci in lectus. Ut ipsum. In hac habitasse platea dictumst.