CIS 4004: Web Based Information Technology
Fall 2012

Advanced Page Layouts – Part 1

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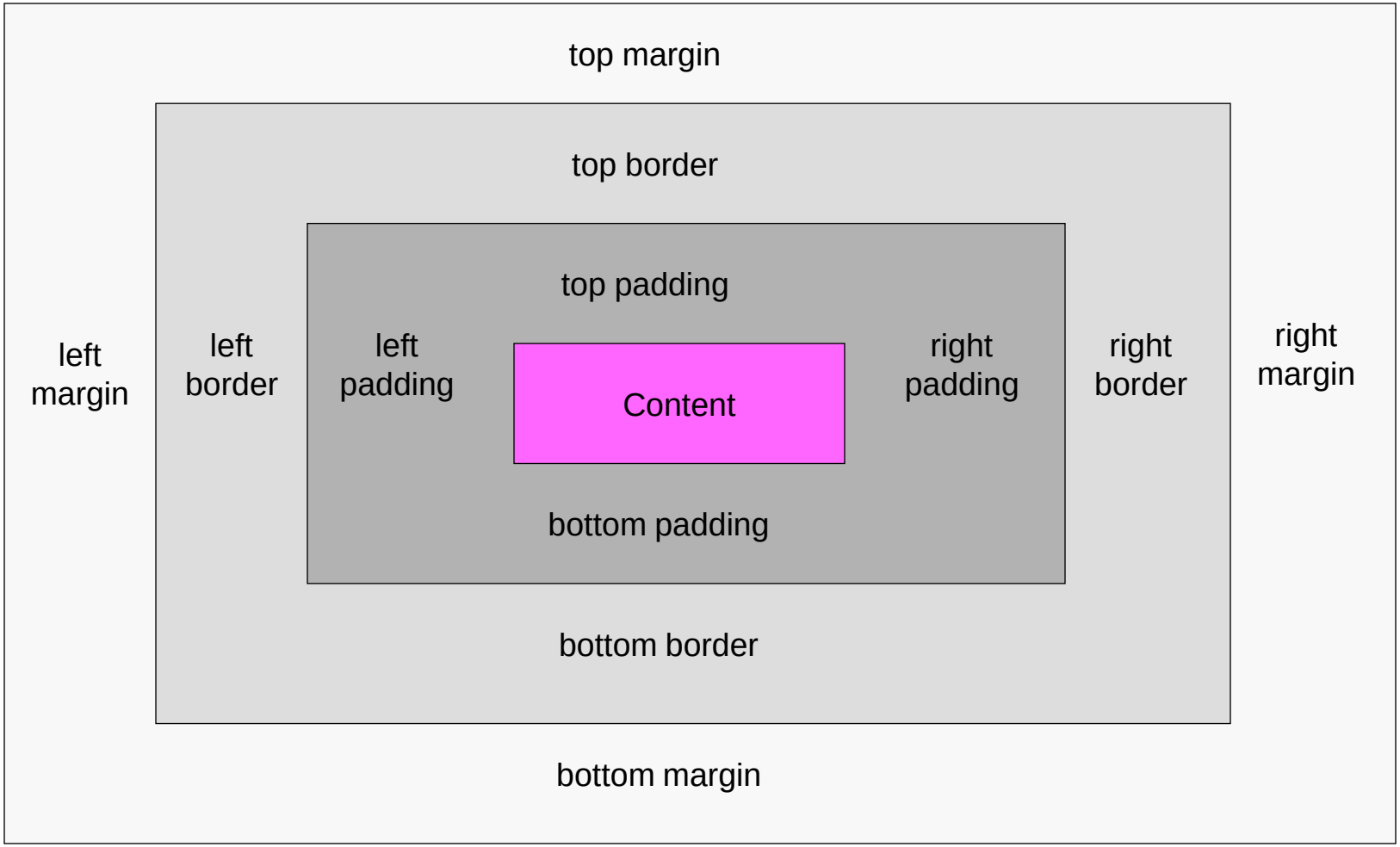
University of Central Florida

The CSS Box Model



Page Layouts

- We've previously (CSS – Page Layouts Parts 1-3) examined the CSS Box Model and the various properties that apply to and affect the elements on a page. Recall that every element is in a box whether you see the box or not.
- Now we want to use the box model to create multi-column page layouts.
- Most Web sites use columns to maximize the amount of information that is "above the fold", an old newspaper term that on the Web means "without scrolling the page."
- Typical layouts use two or three columns but four columns is not unusual.

Page Layouts

- The traditional way of creating such multi-column layouts in XHTML and CSS has been to "float the columns with inner `divs`."

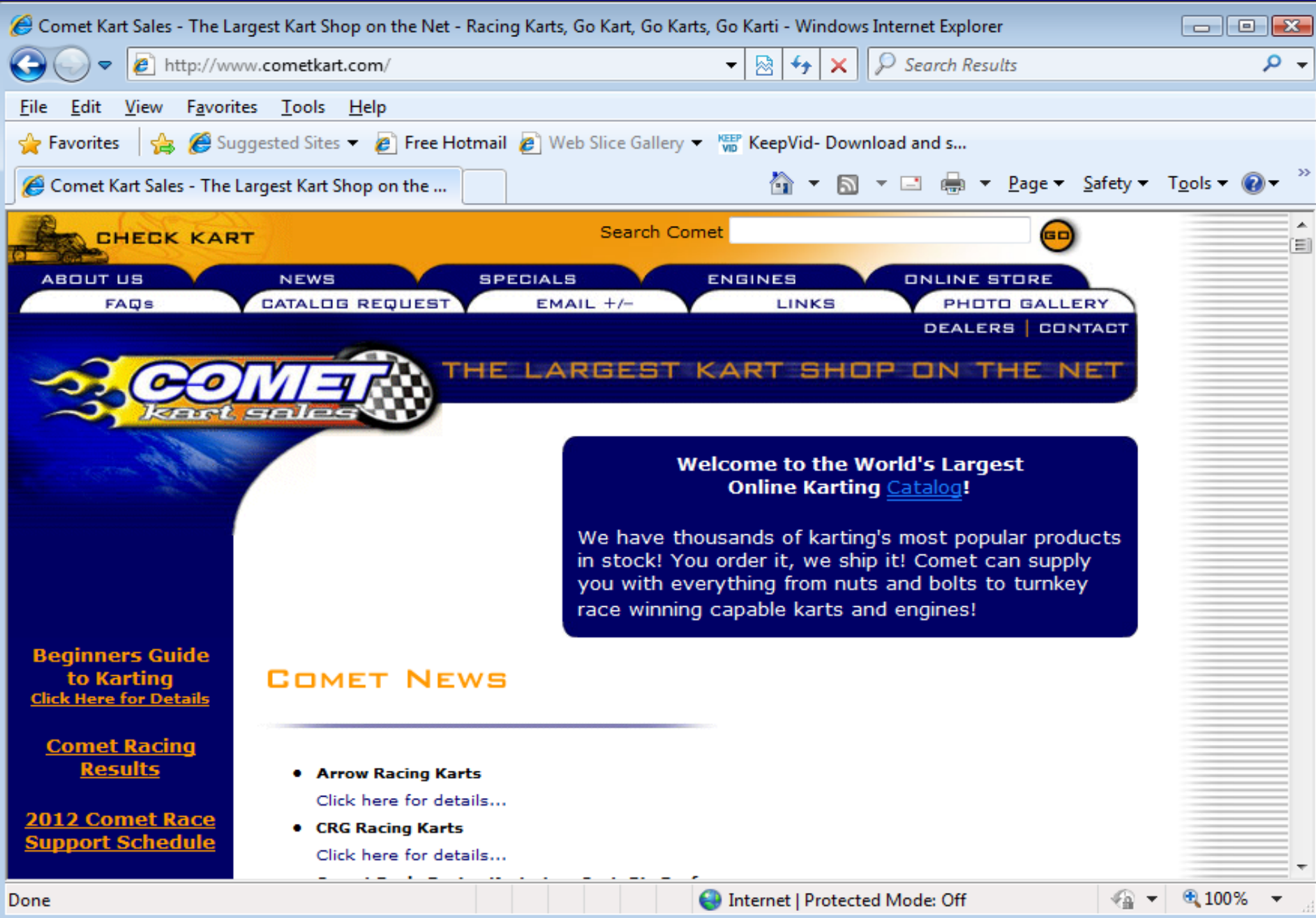
- With CSS3 however, you have some additional options to this more traditional approach. As non-CSS3-capable browsers fade away, you'll be able to use the `box-sizing` property instead of inner `divs`, and you can use the CSS3 `display` property to make elements behave like tables without having to actually add tables into your HTML. These techniques will enable you to create fluid layouts with full-length columns.

Basic Page Layout Concepts

- There are three commonly used options for the basic behavior of a multi-column layout: fixed-width, fluid, and elastic.

Fixed-width layouts do not change in size as the user changes the width of the browser window, and are typically around 900-1100 pixels wide. The 960 figure is a very popular width for fixed-width layouts as it fits on all modern monitors and is readily divisible by 16, 12, 10, 8, 6, 5, 4, and 3, which makes calculations of equal-width columns and other math come out to nice round numbers of pixels.

The next couple of pages illustrates the behavior of a fixed-width layout as the user changes the size of the browser window.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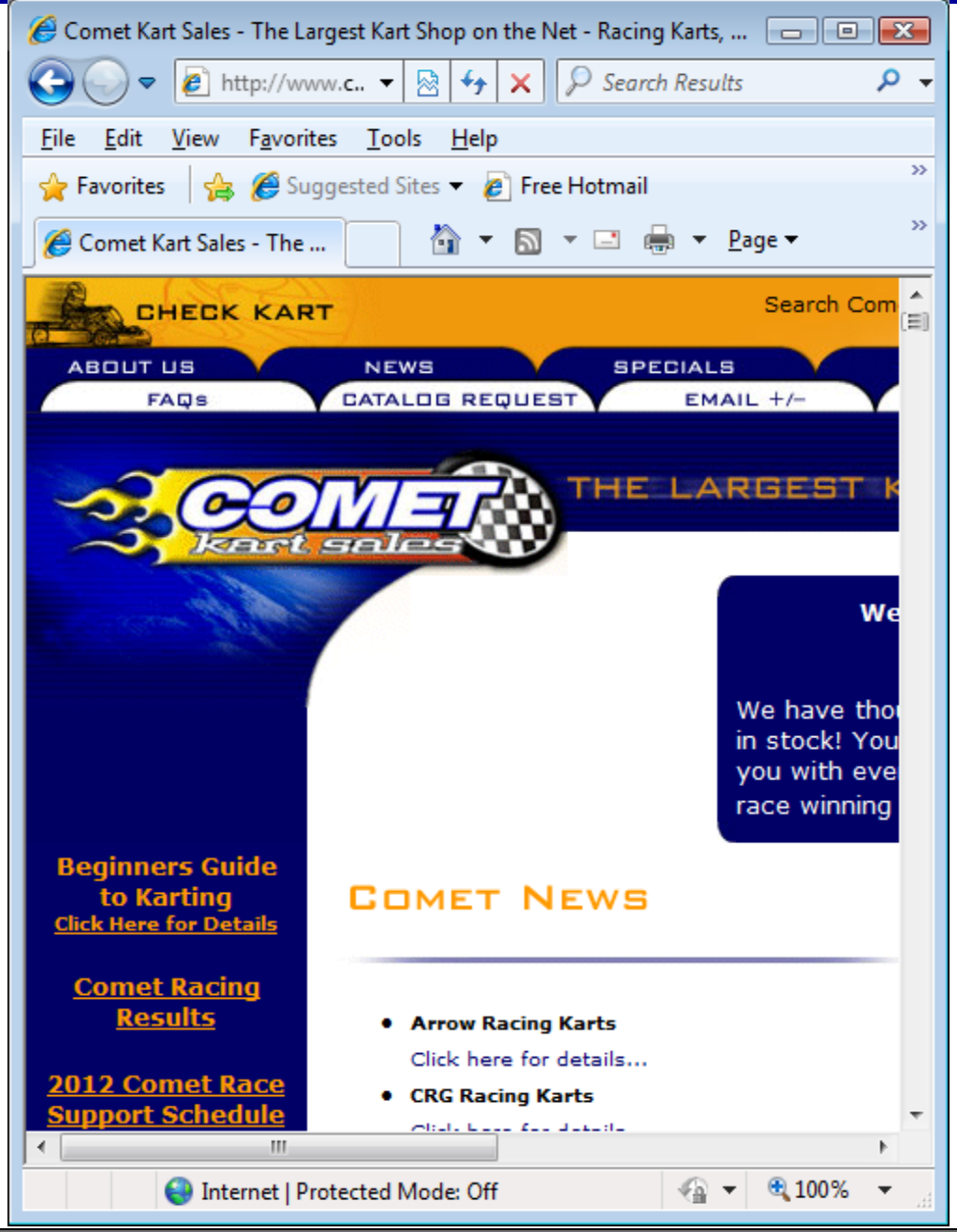
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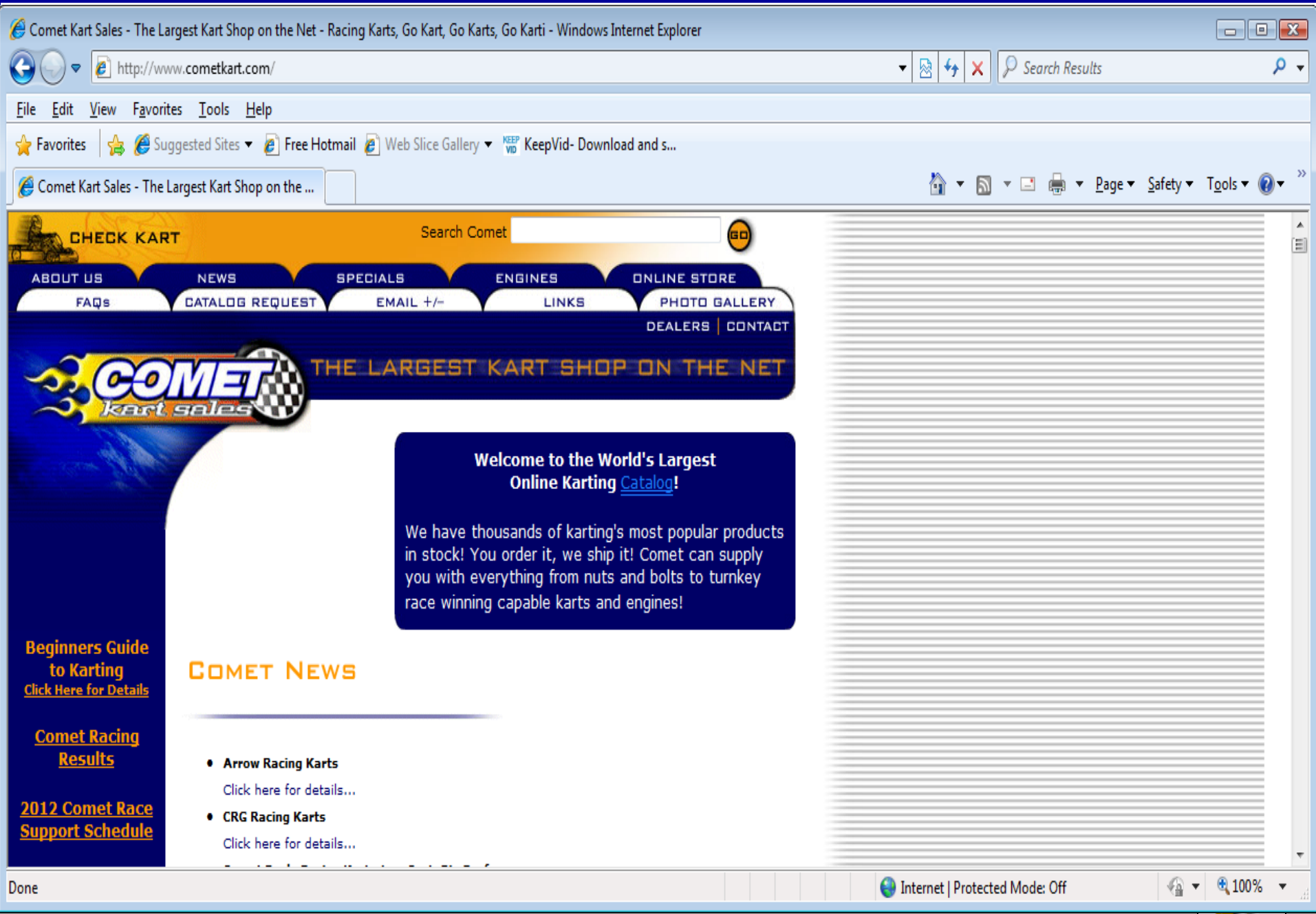
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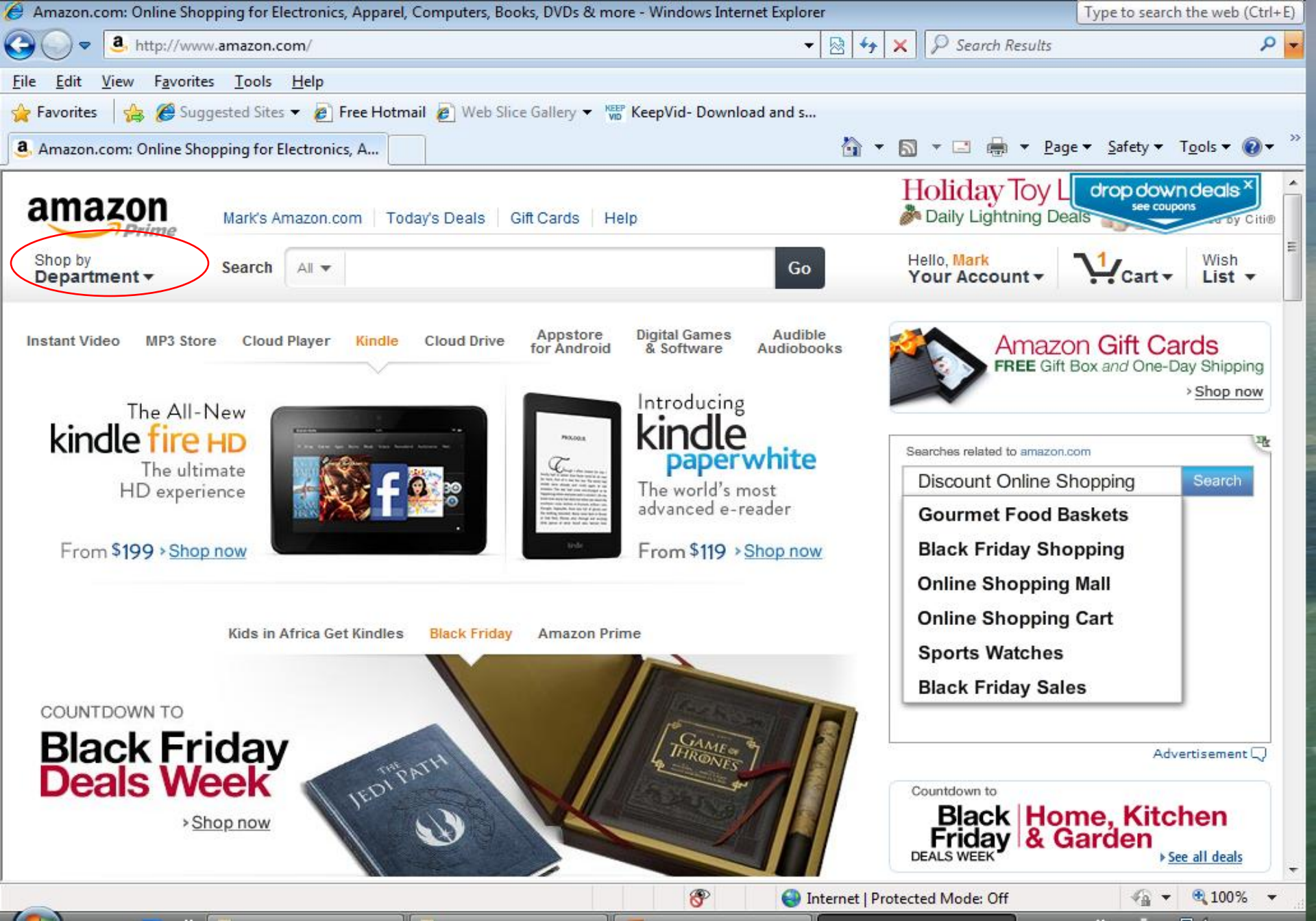
Basic Page Layout Concepts

Fluid layouts change their width as the user adjusts the width of the browser window. While this allows the layout to better scale on large monitors, you give up exact control of the layout when you use a fluid layout, as line lengths change and the relationship of page elements can change as the layout width is adjusted.

Amazon.com has a fluid center on their pages currently, adding white space around content elements to center them when tye columns are widened, and currently the navigation sidebar snaps shut into a drop-down menu to create space for the content if the layout is sized below a certain specific width.

The next couple of pages illustrates the behavior of a fluid layout as the user changes the size of the browser window.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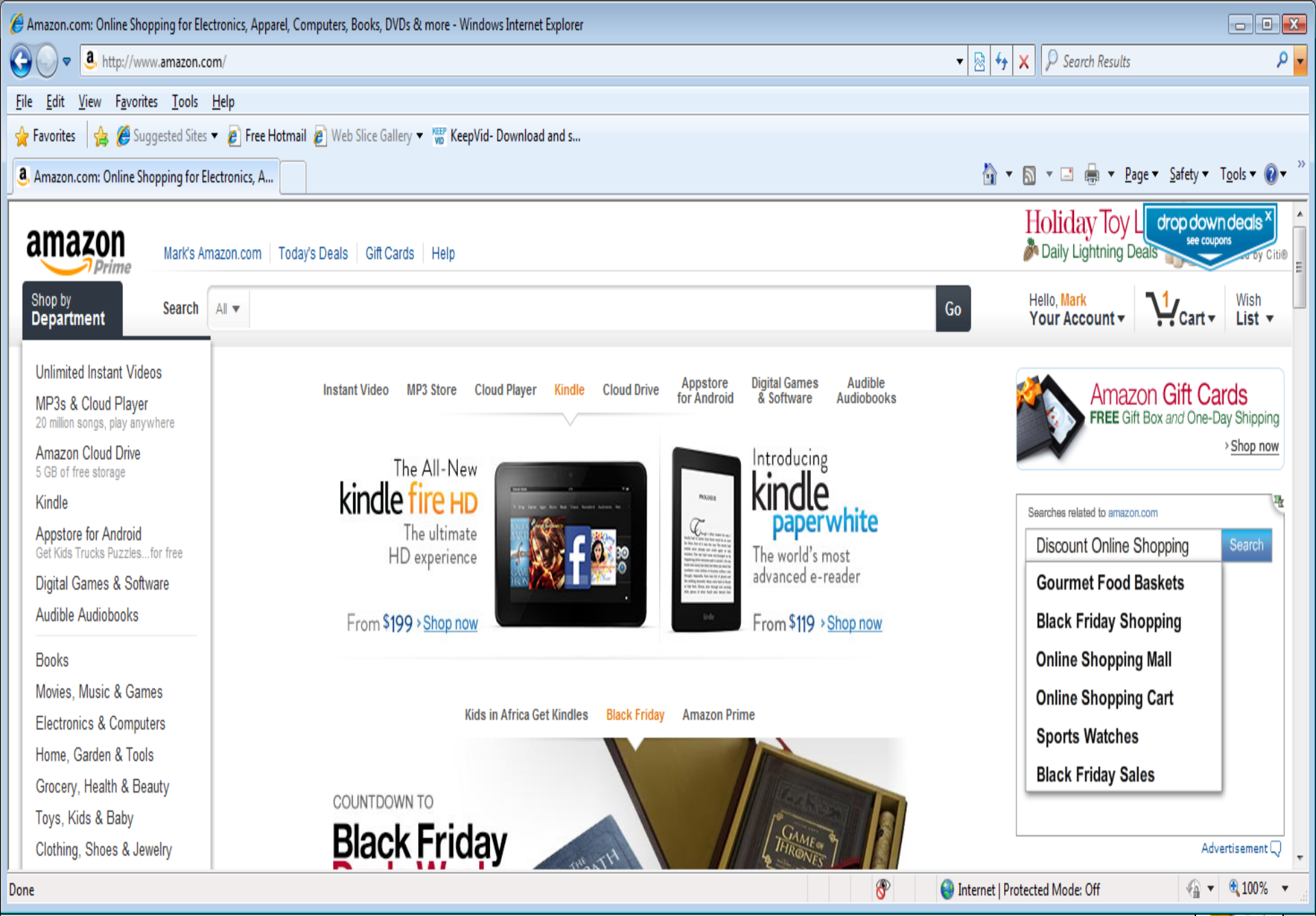
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Get Kids Trucks Puzzles...for free
Digital Games & Software
Audible Audiobooks
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Basic Page Layout Concepts

- With today's browser support of CSS media queries, chich allow you to select CSS based on the user's browser with, fluid layouts are being superceded by layouts that can fix their width at various defined sizes based on the width of the user's display.

- This, of course, is targeting mobile devices. Creating sites that can adapt to the largest and smallest of screens in this fashion is known as responsive design. We'll look at this a bit later.

Elastic layouts are similar to fluid layouts, and not only change the width of the layout when the browser window is resized, but also change the size of all the content elements, producing a zooming effect where everything gets bigger. We won't look at these. They're not too popular and hard to deal with.

Layout Height And Layout Width

- In most cases, you don't need to set the height of the structural elements of the layout, or of any elements, for that matter.
- In general, you should avoid setting the height of elements. If you do set an element's height, be sure you have a good reason for doing so, such as creating an absolutely positioned element on the page.
- The reason that you typically want to leave an element in its default `auto` height state is that it can then expand vertically to accommodate whatever amount of content is placed in it.
- An element that expands in this way can then push down the elements that sit below it and your layout can "breathe" vertically as the quantity of content changes over time.

Layout Height And Layout Width

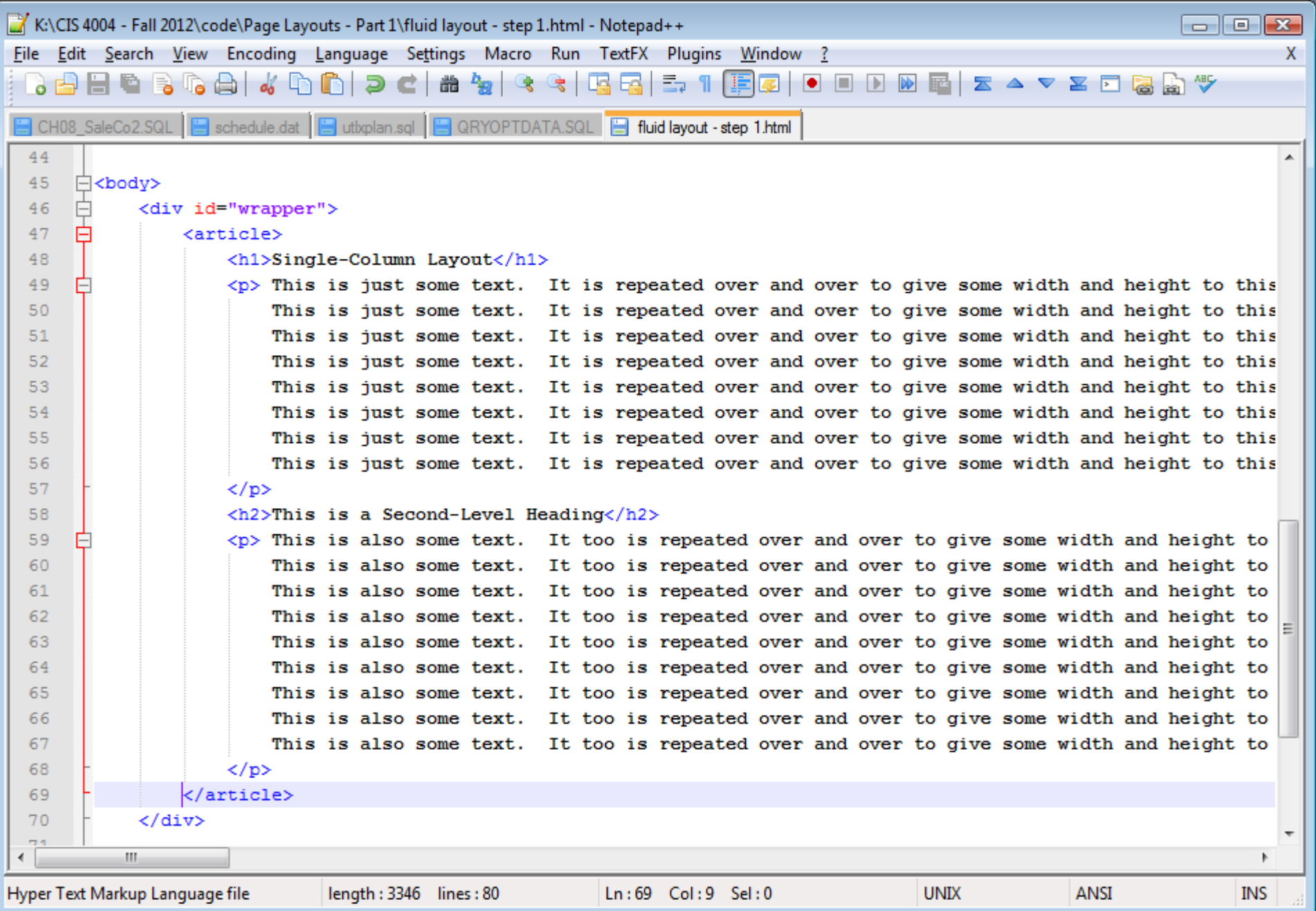
- If you explicitly set an element's height, excessive content will either be clipped or flow out of the container, dependent on the setting of the element's `overflow` property.
- In contrast to height, the width of your layout needs to be carefully controlled, so that the layout fits within the width of a reasonably-size browser window, and the text lines don't get too long or short.
- The indiscriminate adding of padding, borders, and large elements can cause floated elements to "slip under" one another if their width is forced wider than the wrapper element that sets the layouts size.

Layout Height And Layout Width

- However, while you want to set the width of the columns, you don't want to set the width of the content element within them, but simply let the content elements expand to fill the width of the column – as we've seen before, block-level elements do this by default.
- This effect is created with a nested `div` approach where the inner `div` is used to allow the content to expand to the full width of the outer `div` element.
- So the basic strategy is to control the layout's width but let the content set the layout's height.

Creating Columns

- We'll focus on the CSS needed to create a fluid three-column layout. Once you understand the concepts of how its done, you can create layouts with as many columns as you'd like.
- I'm going to use colored backgrounds for each of the columns in the layouts we'll step through so that you can see exactly what's going on with the structure of the page.
- We'll start with a single fixed-width column centered in the page. The markup is a `wrapper` to set the width of the layout, with a container for the column (content) inside it.
- The markup is shown on the next page with the pertinent CSS on the following page and the rendering on the page after the CSS.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<article>
<h1>Single-Column Layout</h1>
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</article>

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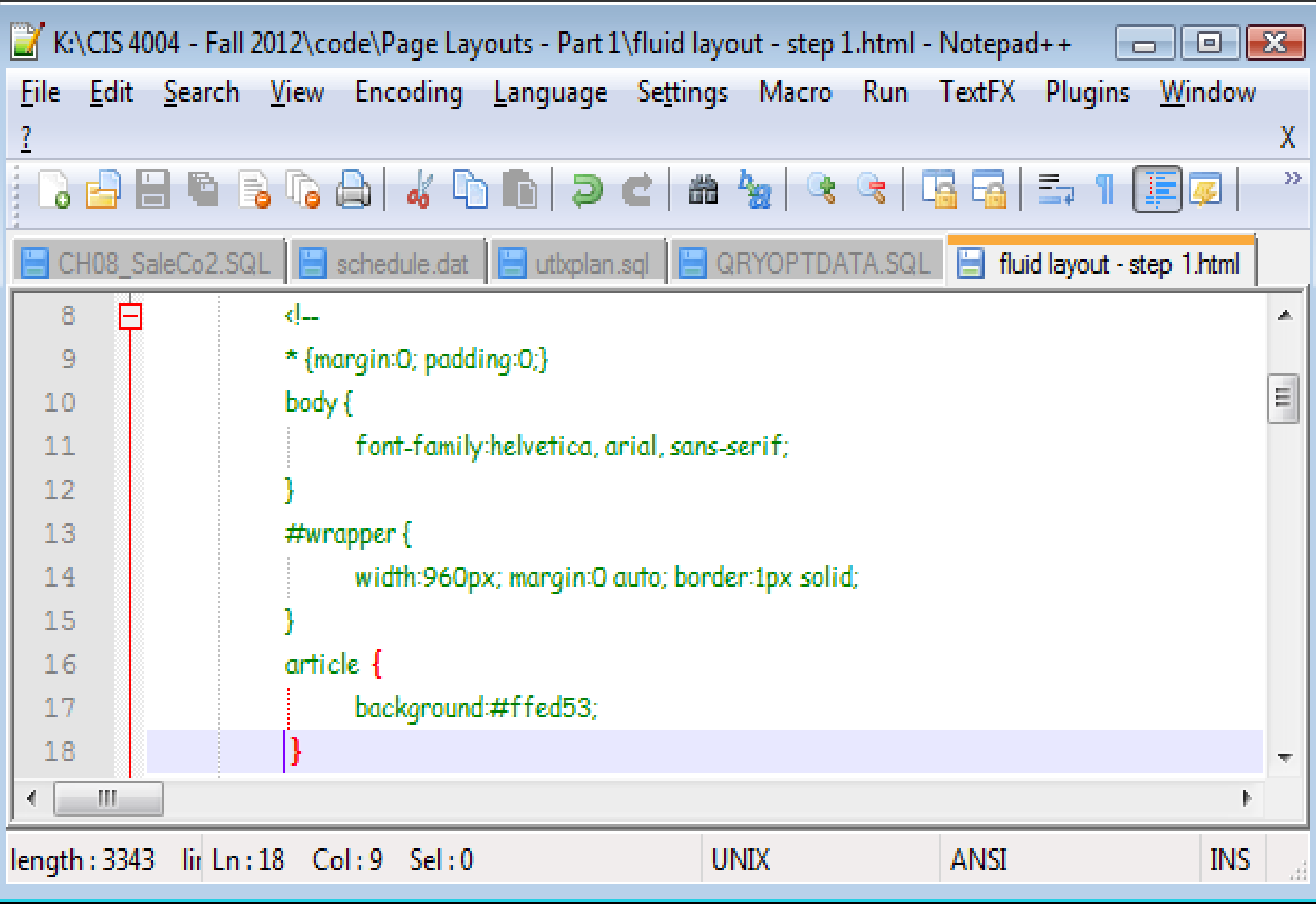
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fluid layout - step 1.html
8 <!--
9 * {margin:0; padding:0;}
10 body {
11 font-family:helvetica, arial, sans-serif;
12 }
13 #wrapper {
14 width:960px; margin:0 auto; border:1px solid;
15 }
16 article {
17 background:#ffed53;
18 }
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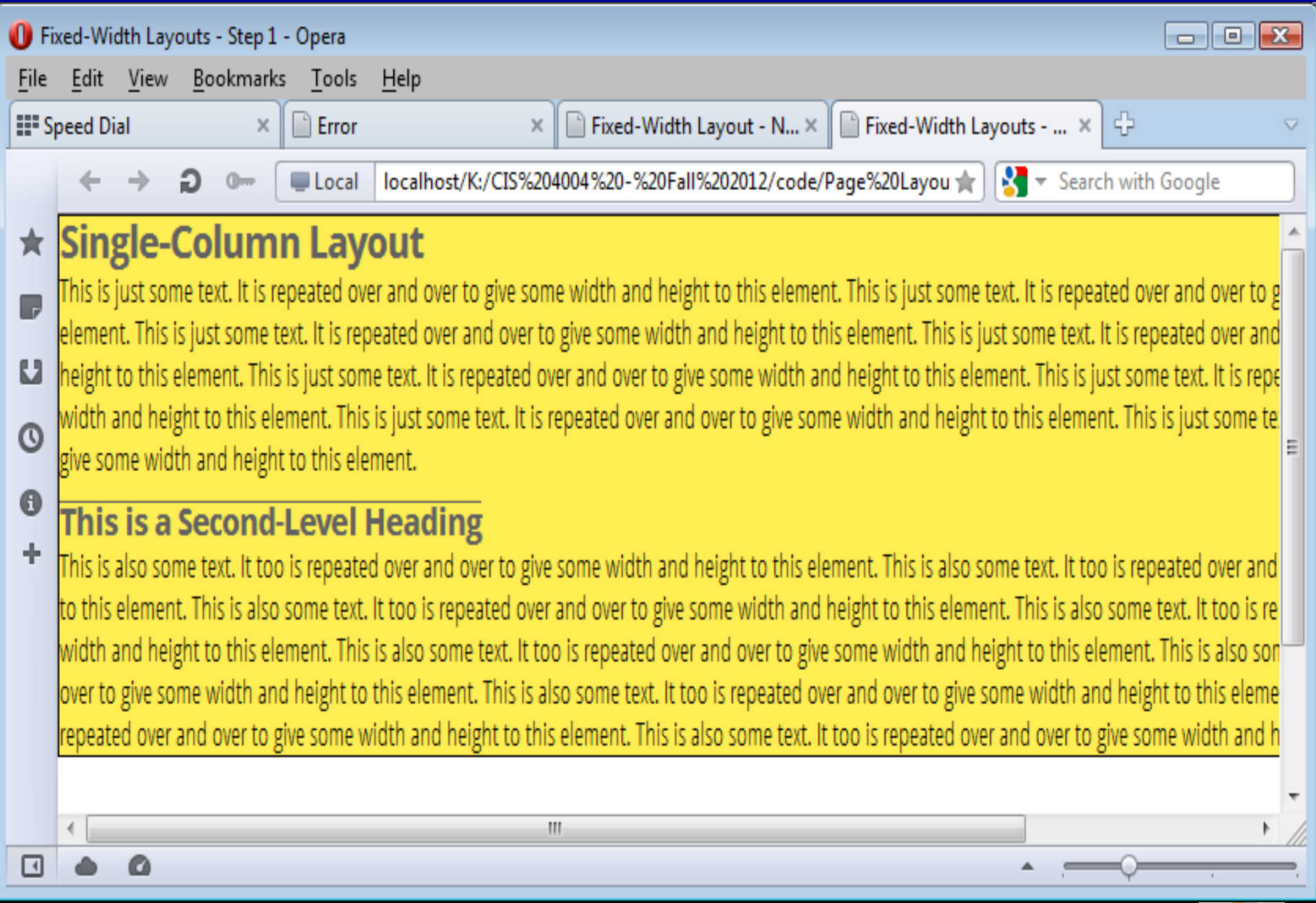
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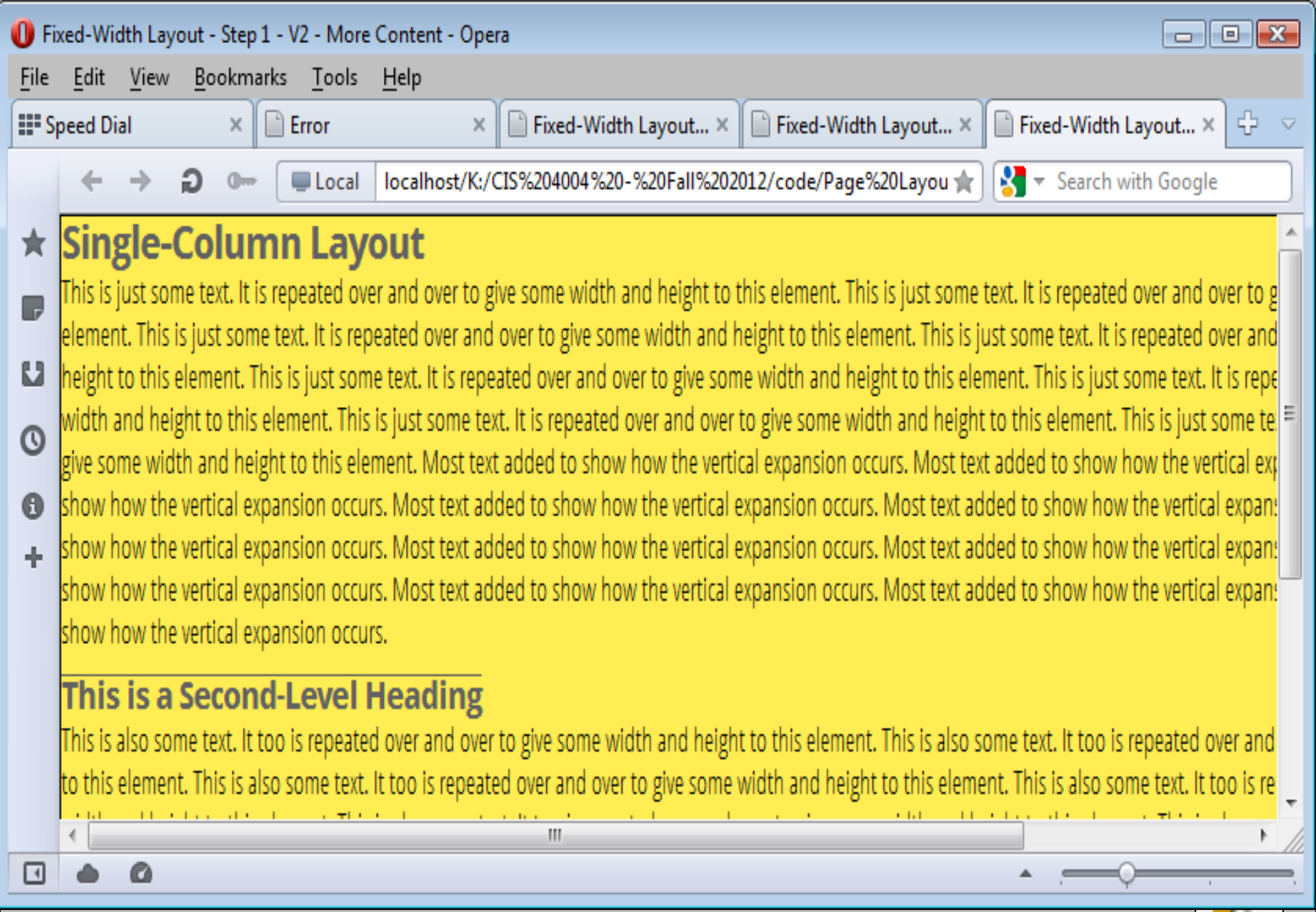
Creating Columns

- By fixing the width of the `wrapper` and applying `auto` horizontal margins to it, as shown in the CSS, the layout will be centered in the window.
- Its height can increase freely as more content is added to it (see next page rendering with more content added to the first paragraph - browser window not resized from previous version).
- The `article` element inside the `wrapper div` simply behaves like any unwidthed block-level element and expands horizontally to fill the wrapper.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Creating Columns

- Now, let's add a second column of navigational elements to the left side of the page.
- As we discussed in the earlier notes on CSS Page Layouts, we need to float the wrapper containers for the two columns in order to get them to sit side by side.
- As you can see in the markup on the next page and the CSS on the following page, the width of the two containers equals the width of the wrapper (150+810=960), and floating them causes them to sit side by side to form two columns. Each column is as long as its content.
- It's now quite easy to add a third column (or as many as you'd like) in this manner.

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62      <div id="wrapper">
63          <nav>
64              <ul>
65                  <li><a href="#">Link 1</a></li>
66                  <li><a href="#">Link 2</a></li>
67                  <li><a href="#">Link 3</a></li>
68              </ul>
69          </nav>
70          <article>
71              <h1>Two-Column Layout</h1>
72              <p> This is just some text.  It is repeated over and over to give some width anc
73                  This is just some text.  It is repeated over and over to give some width anc
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80              </p>
81              <h2>This is a Second-Level Heading</h2>
82              <p> This is also some text.  It too is repeated over and over to give some widtl
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8   <!--
9       * {margin:0; padding:0;}
10      body {
11          font-family:helvetica, arial, sans-serif;
12          }
13      #wrapper {
14          width:960px; margin:0 auto; border:1px solid; overflow:hidden;
15          }
16      nav {
17          width:150px;
18          float:left;
19          background:#dcd9c0;
20          }
21      nav li {
22          list-style-type:none;
23          }
24      nav a {
25          font-family:'Open Sans Condensed';
26          font-weight:700;
27          font-size:1.2em;
28          color:#616161;
29          }
30      article {
31          width:810px;
32          float:left;
33          background:#ffed53;
34          }
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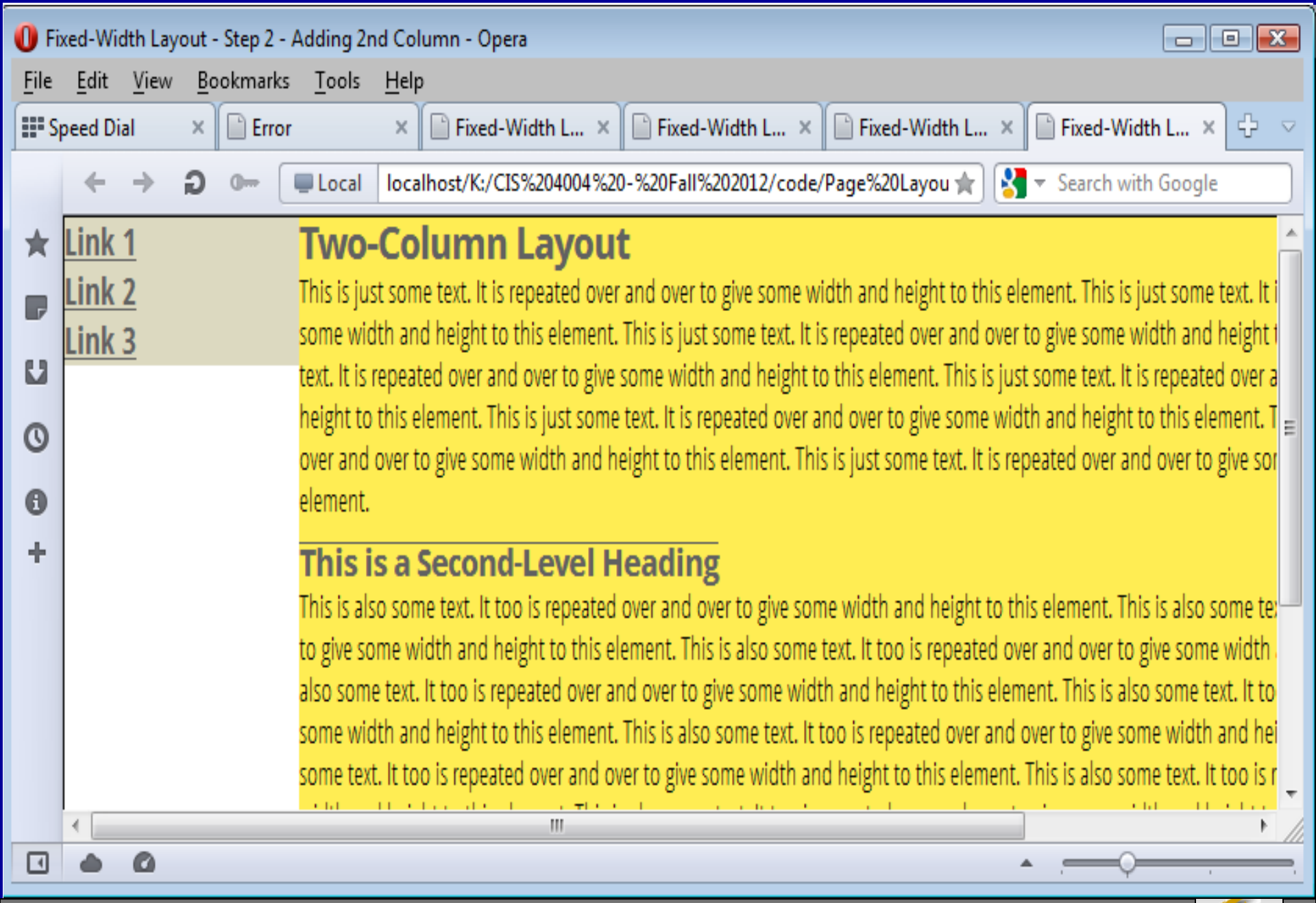
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Creating Columns

- Now, let's add the third column, which will play the role of an `aside` in our three-column layout.
- Once again, we'll need to adjust the width of the `article` column to make room for the new `aside` content column. Once again, the total horizontal width must equal 960 pixels, so we'll leave the navagational content at 150 pixels, and make the aside content 210 pixels wide. 960 – 150 – 210 = 600 pixels for the new width of the `article` (main) column.
- We now have the framework in place for a three-column layout.
- The next page illustrates the CSS for the new layout and the following page shows the rendering.

K:\CIS 4004 - Fall 2012\code\Page Layouts - Part 1\fluid layout - step 3 - three columns.html - Notepad++

File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window ? X

fluid layout - step 1.html | fluid layout - step 1 - V2.html | fluid layout - step 2.html | fluid layout - step 3 - three columns.html

```
33              background:#ffed53;
34              }
35          article h1 {
36              font-family:'Droid Sans';
37              font-weight:700;
38              font-size:1.5em;
39              letter-spacing:-.05em;
40              color:#616161;
41              }
42          article h2 {
43              font-family:'Droid Sans';
44              font-weight:700;
45              font-size:1.25em;
46              letter-spacing:-.05em;
47              color:#616161;
48              text-decoration:overline;
49              margin:10px 0 0 0;
50              }
51          article p {
52              font-family:'Open Sans Condensed';
53              font-weight:300;
54              font-size:1em;
55              color:#000;
56              }
57          aside {
58              width:210px;
59              float:left;
```

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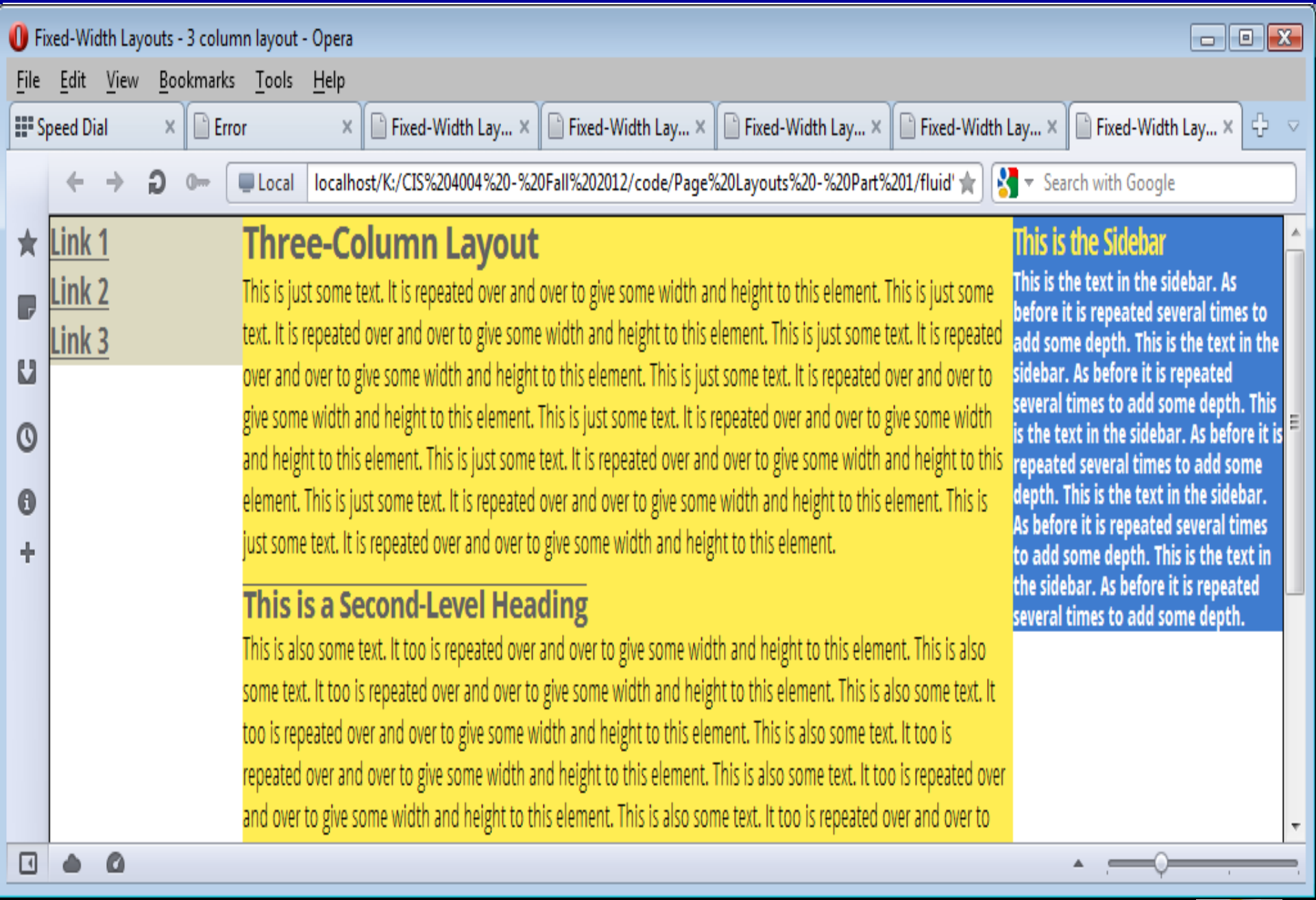
Fixed-Width Layouts - 3 column layout - Opera
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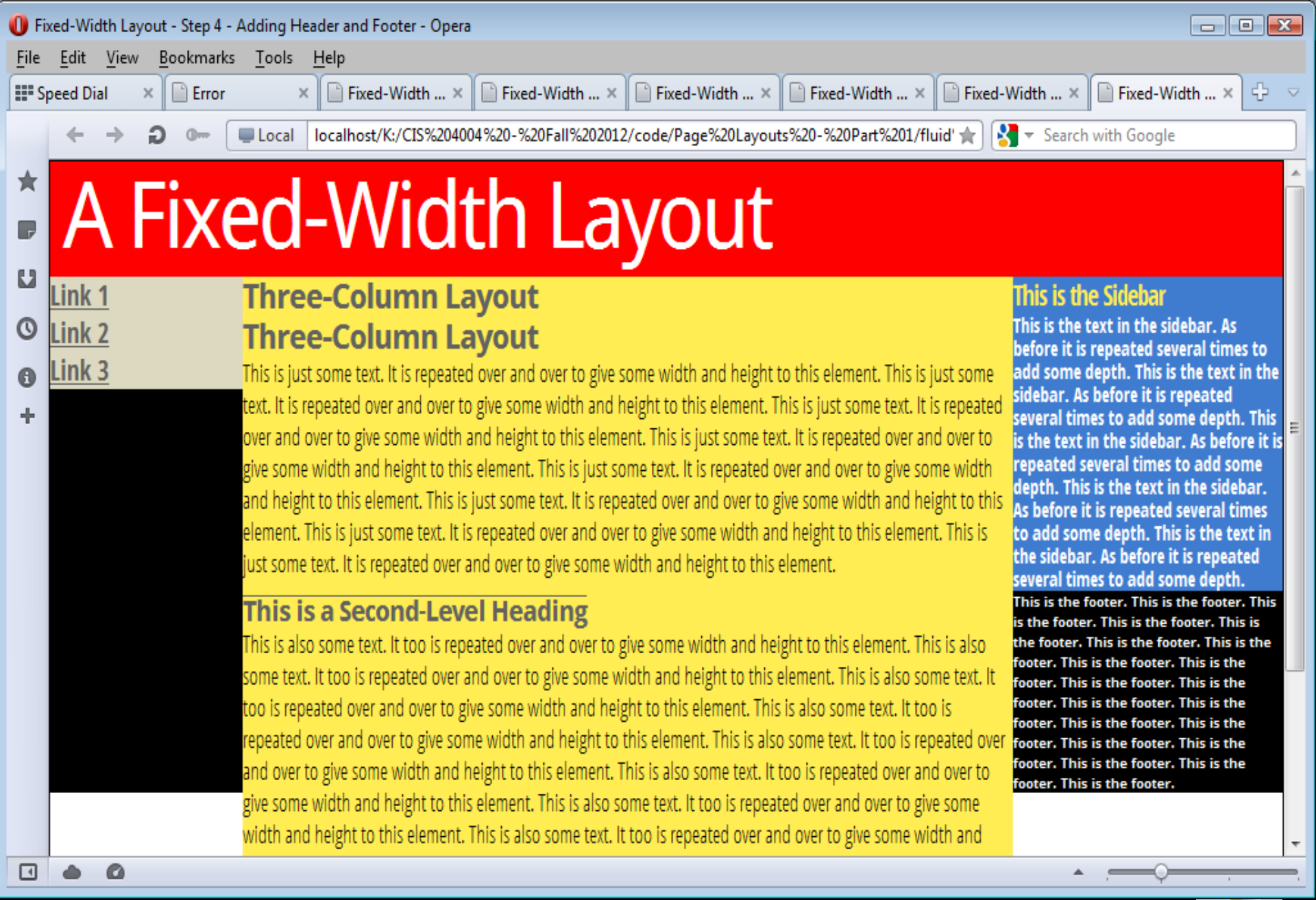
Creating Columns

- Most multi-column layouts have a full-width header and footer, so let's add them to our layout next.
- As before, the block-level elements will default to full-width of their encompassing container, which is of course the effect that we want.
- I'll color their backgrounds differently here so it is obvious where the various elements are being placed on the page.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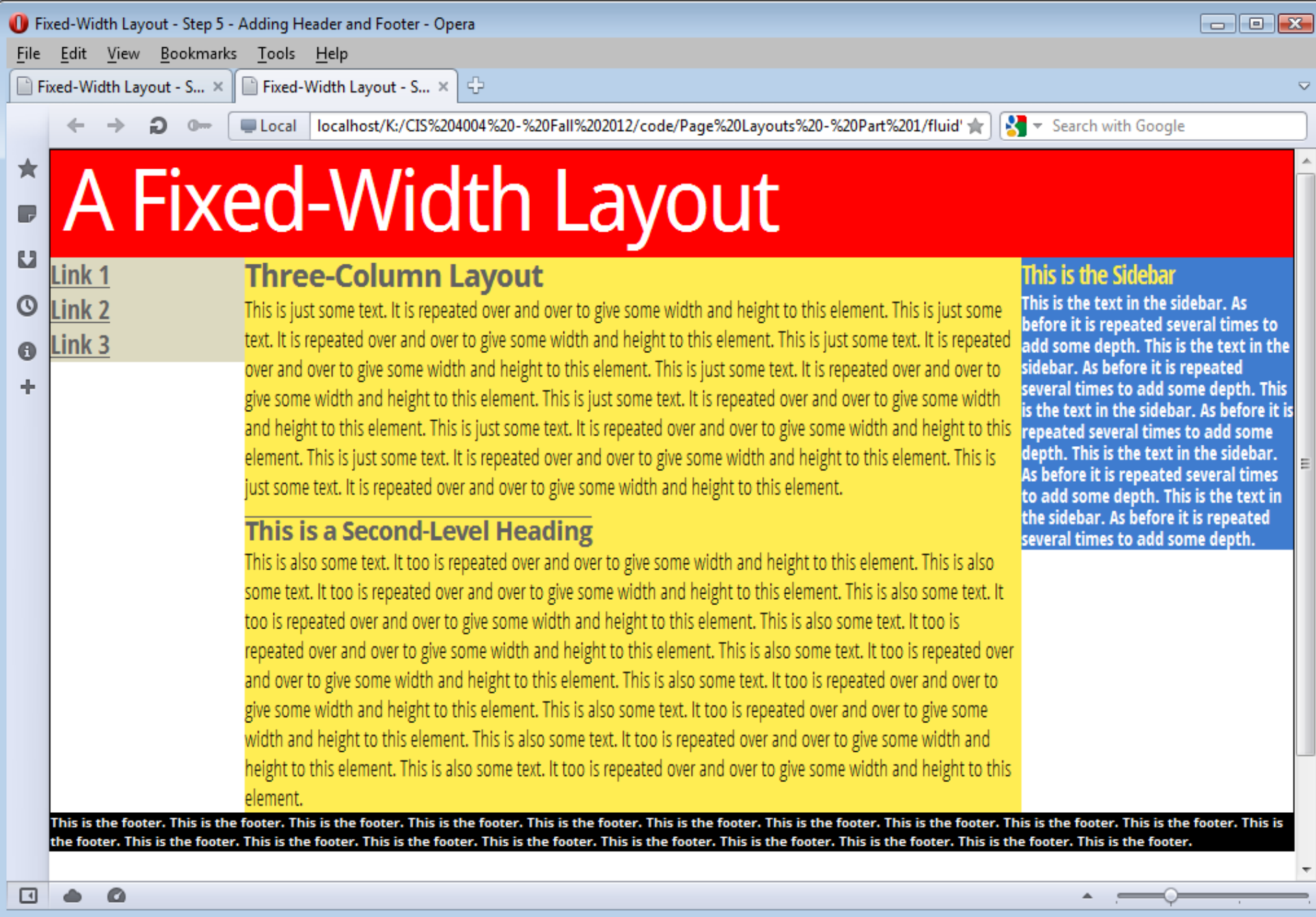
Creating Columns

- What happened? The header looks fine, but the footer moved up behind the floated columns.
- Why did this happen?
- The footer follows floated elements in the markup, so it moves up as high as it can in the layout. To fix this problem we must make the footer clear any elements on both its left and right sides. Note that in this case, clearing on the left only would work equally well, as there are only floated left elements in this case. In any case, the clear prevents the footer from moving up above the bottom of the floated elements. The footer will now set under whichever column is the longest.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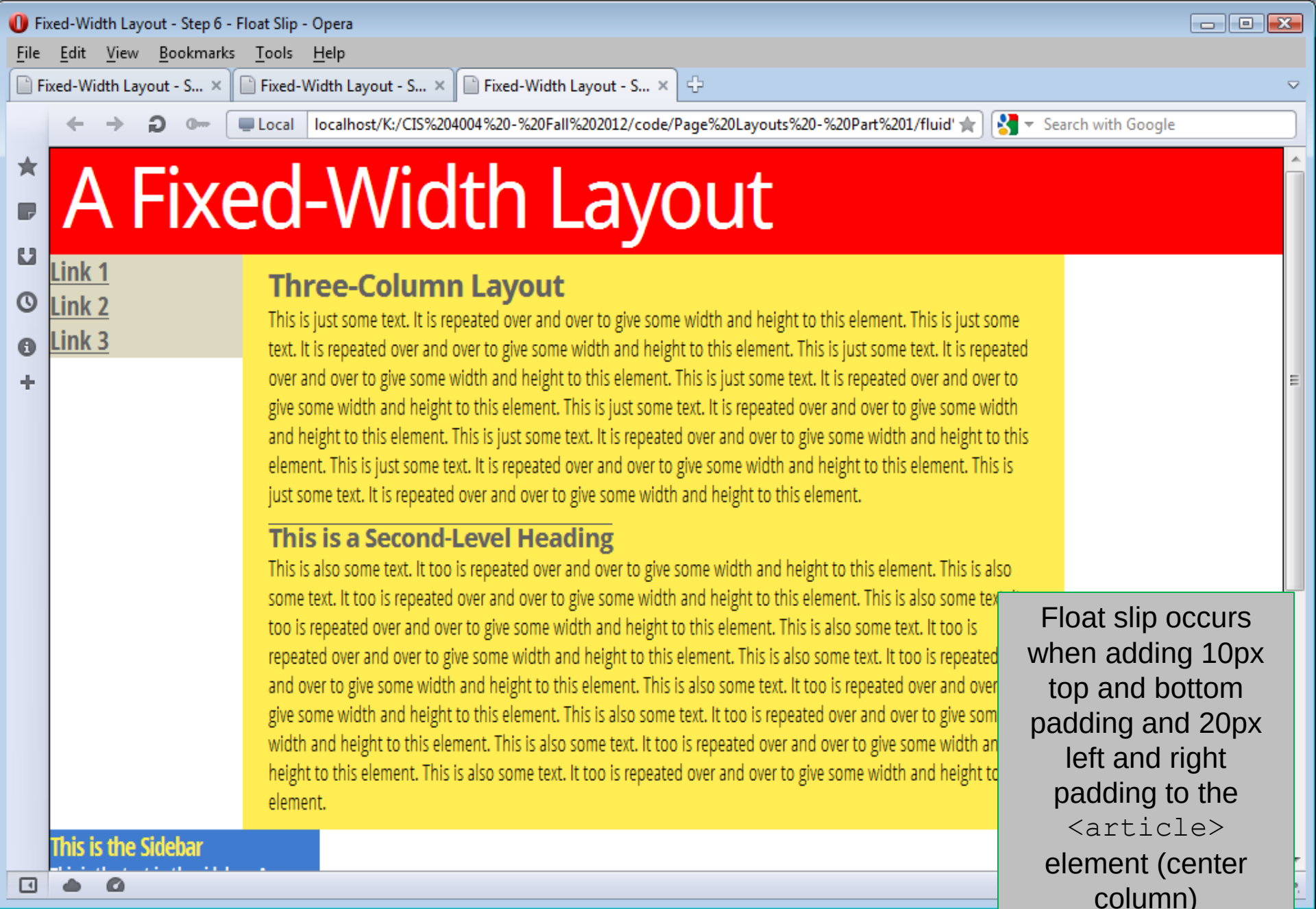
Fixing Some Issues

- While the layout on the previous page looks pretty good, there are two obvious issues with it.
- First the content is jammed against the edges of the columns.
- Second, the columns are only as tall as their content and the layout would look better if they were all full height.
- The first problem is handled with padding and margins and we've seen much of this before, but I want to point out a few things to be careful about when adding them into more complex layouts.

Fixing Some Issues

- When you start to work with the content inside the columns, the layout can become wider than its container, and the right column will slip under the left column. There are two ways this usually happens:
  - Adding horizontal margins and padding to the columns to move their content away from the sides, or adding margins to the columns to create space between them (and you almost always want to do one or both things as you style your layout) increases the width of the layout, and causes "float-slip", where the floated right column no longer has room to sit next to the other, and slips down under the left column.
  - Adding large images, or long sequences of characters with no spaces such as URLs, can force the column width to exceed the layout width. This again causes the right column to slip under the left one.



Float slip occurs when adding 10px top and bottom padding and 20px left and right padding to the `<article>` element (center column)

Fixing Some Issues

- As you may recall from our earlier discussions of the box model, the addition of any horizontal margins, borders, or padding to a fixed-width element makes the element wider.
- Adding width to floated columns in this way almost always causes the "float-slip" that was just illustrated.
- There are three ways to prevent the "float-slip":
  - Reduce the stated width of the element by the total of the horizontal margins, borders, and padding that are added to it.
  - Apply the padding or margins to elements inside the container instead of to the container itself (the nested `div` approach).
  - Switch the way box sizing works by using the CSS3 box-sizing property, like this: `section { box-sizing: border-box; }`

Fixing Some Issues – Solution 1

- Let's examine each of the three ways to fix the "float-slip" problem:

Reset the width to offset the padding and borders

- Suppose that we add 20 pixels of padding to each side of a 600-pixel-wide column. To compensate for the added padding, you would need to narrow the width of the column by 40 pixels to 560 pixels, and then the right column would move back into position.
- The problem with this approach is that resetting the width of the layout every time you adjust the margins or padding would get very tedious, and is thus not an ideal situation. It is too easy to break the layout, even accidently, when adjusting the padding and borders.

Fixing Some Issues – Solution 2

Apply padding and borders to elements inside the container

•This approach does work, as long as the elements don't have an explicit width, their content will simply get narrower as margins or padding are added to them.

•As the box model states: an unwidthed element fills its parent element horizontally, and its content is reduced in width as margins, borders, and padding are added.

•The main problem with this approach is that a very large number of different content elements can appear within a column. If you later decide to change the distance of the content from the edge of the container, you have to adjust that distance on every content element, which is again tedious and invites errors.

Fixing Some Issues – Solution 2

- Also, if you do want to style the column border, which would also add to its width, you can't do that by styling the individual content elements within it.
- This is where the nested `<div>` approach comes to the rescue. By adding an unwidthed `<div>` inside the column that encloses all the content elements, and applying the borders and padding to that element instead, you in effect contain the expansion of the margins, borders and padding to within the enclosing `<div>` element.
- The advantage is that now you can move all the content elements the same distance away from the edge of the column with a single setting on the inner `<div>` that is easily adjusted later if necessary.

Fixing Some Issues – Solution 2

- To see how the nested `<div>` approach solves the problem, we'll modify our running example, yet again.
- I've applied the technique only to the center column (the <article> element) in order to illustrate the technique better and styled the border of the inner `<div>`. The relevant CSS is shown below:

```
article .inner {
    margin:10px;
    border:2px solid red;
    padding:20px;
    }
```

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```
<article>
    <div class="inner">
        <p> This is just some text.  It is repeate
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        some text.  It too is repeated over and ov
        This is also some text.  It too is repeate
    </p>
    </div> <!-- end inner div -->
</article>
```

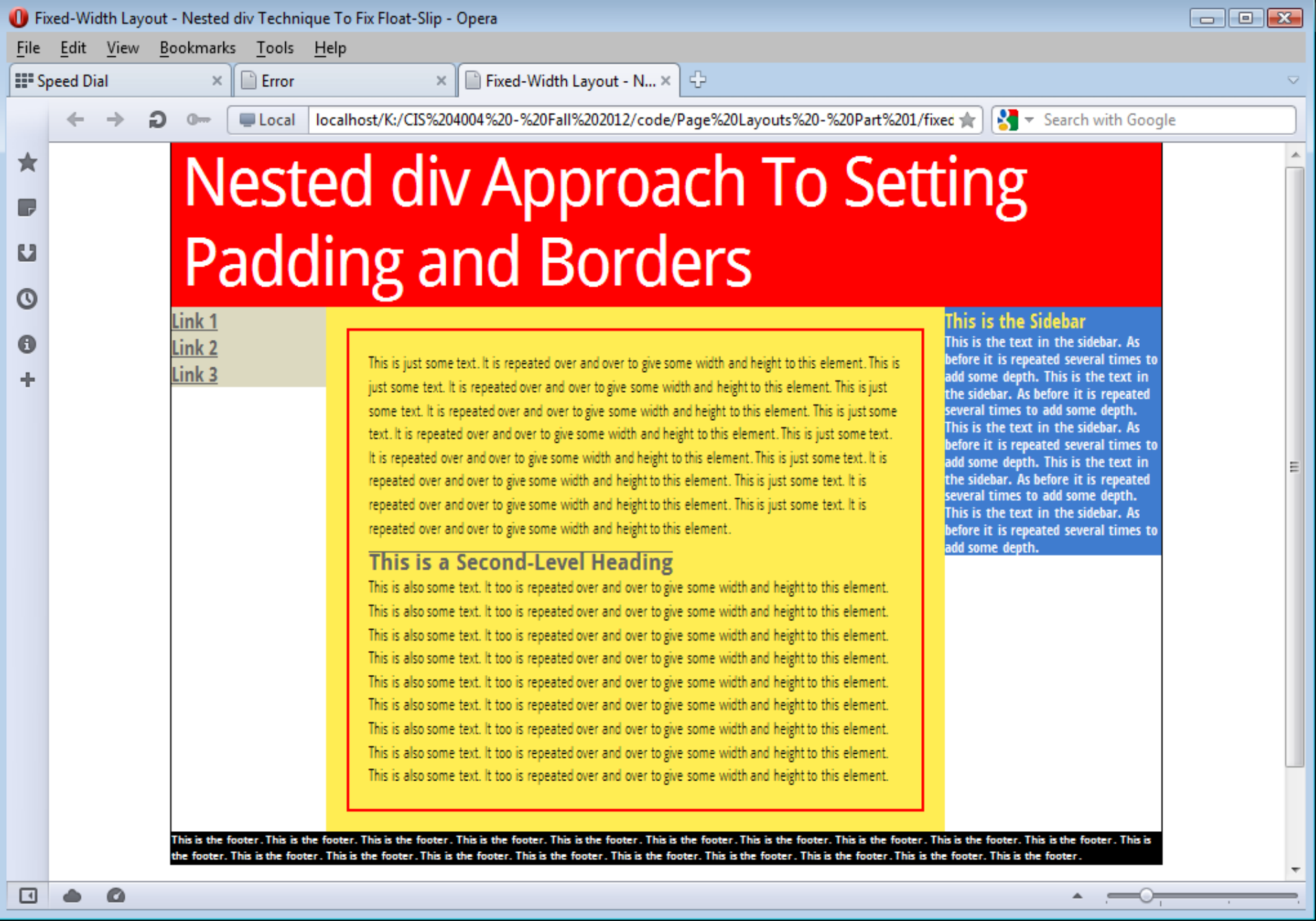
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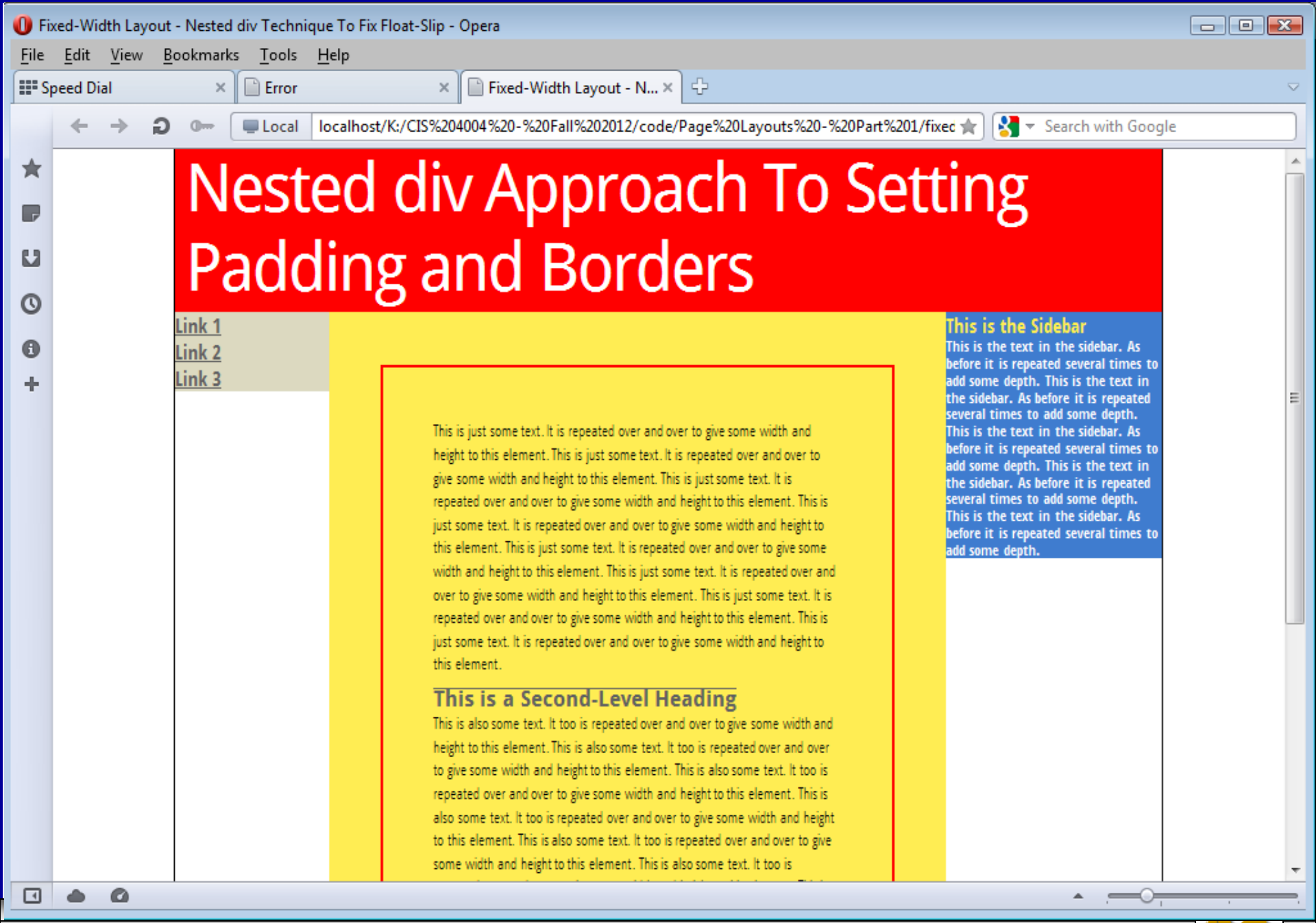
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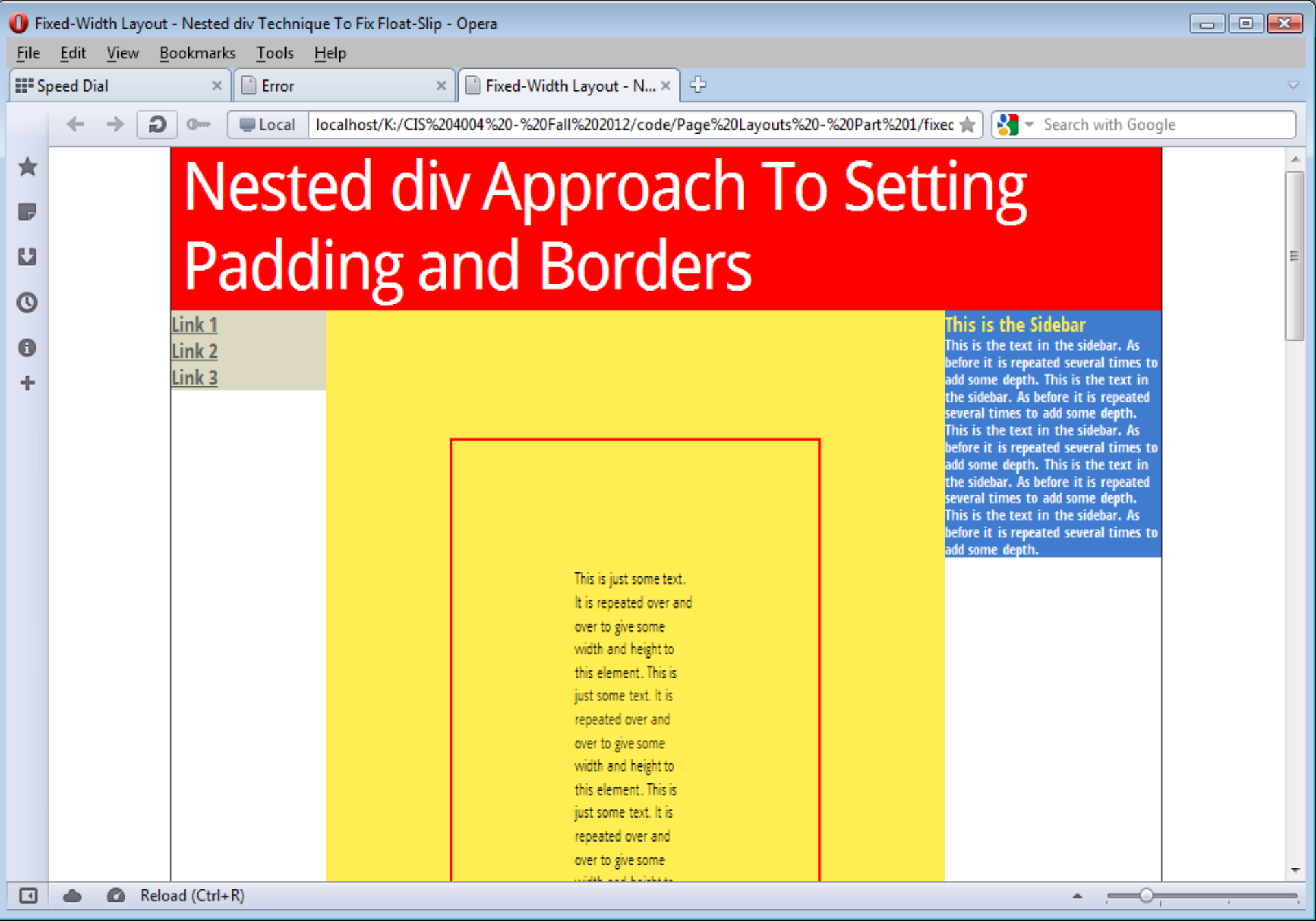
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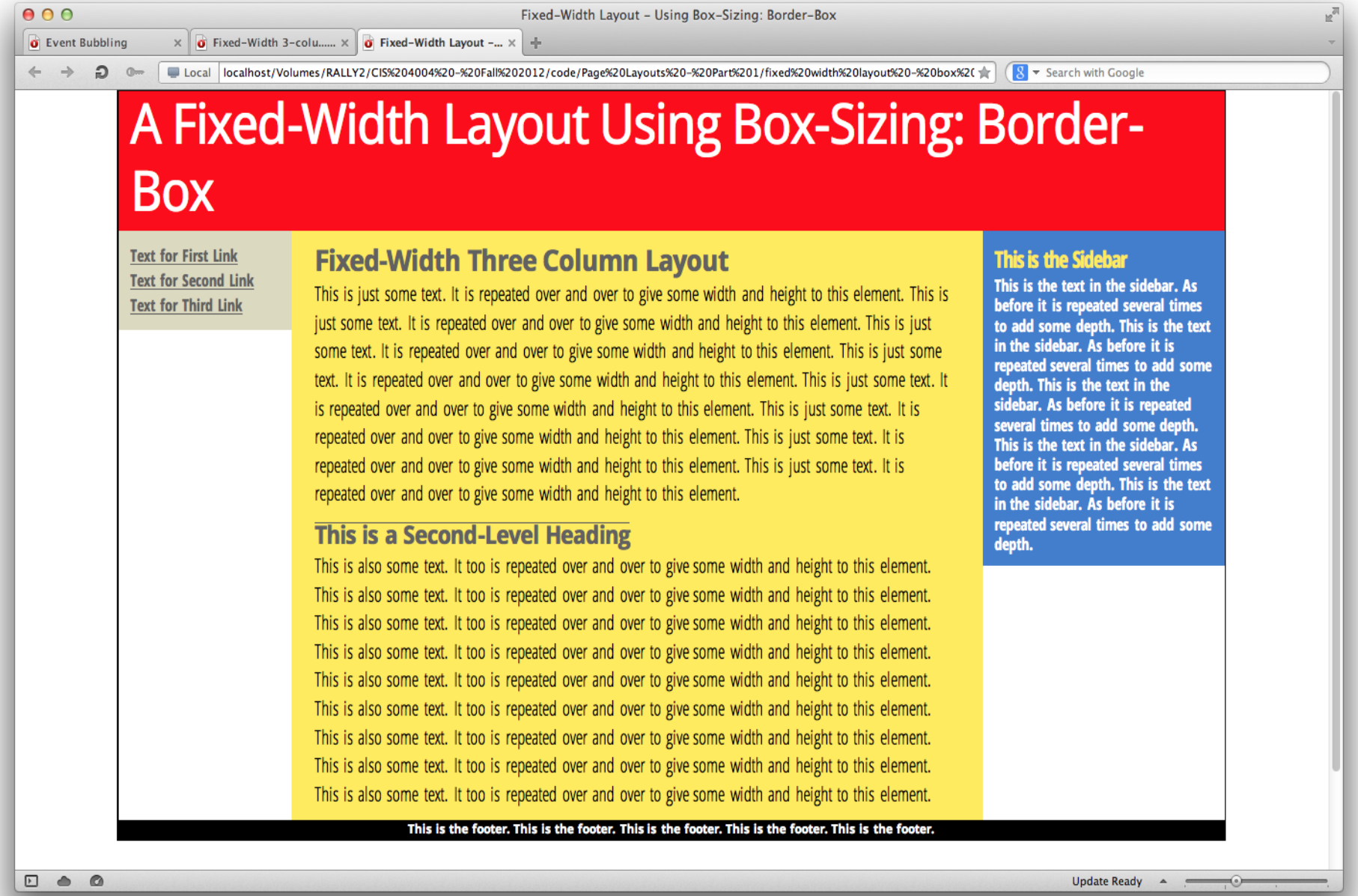
Reload (Ctrl+R)

Fixing Some Issues – Solution 2

- Now that you see how the nested `<div>` approach works, we'll complete this step by adding nested `<div>`s to the other two columns and remove the borders, padding, and margins on the center column, to produce a final fixed-width layout using the nested `<div>` approach.
- Notice the improvements with the added space around the text in each of the columns.
- Also notice that I centered the text in the footer. I removed some of the text from the footer so that this change is apparent.
- The markup for this version is available on the course webpage.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Update Ready

Fixing Some Issues – Solution 3

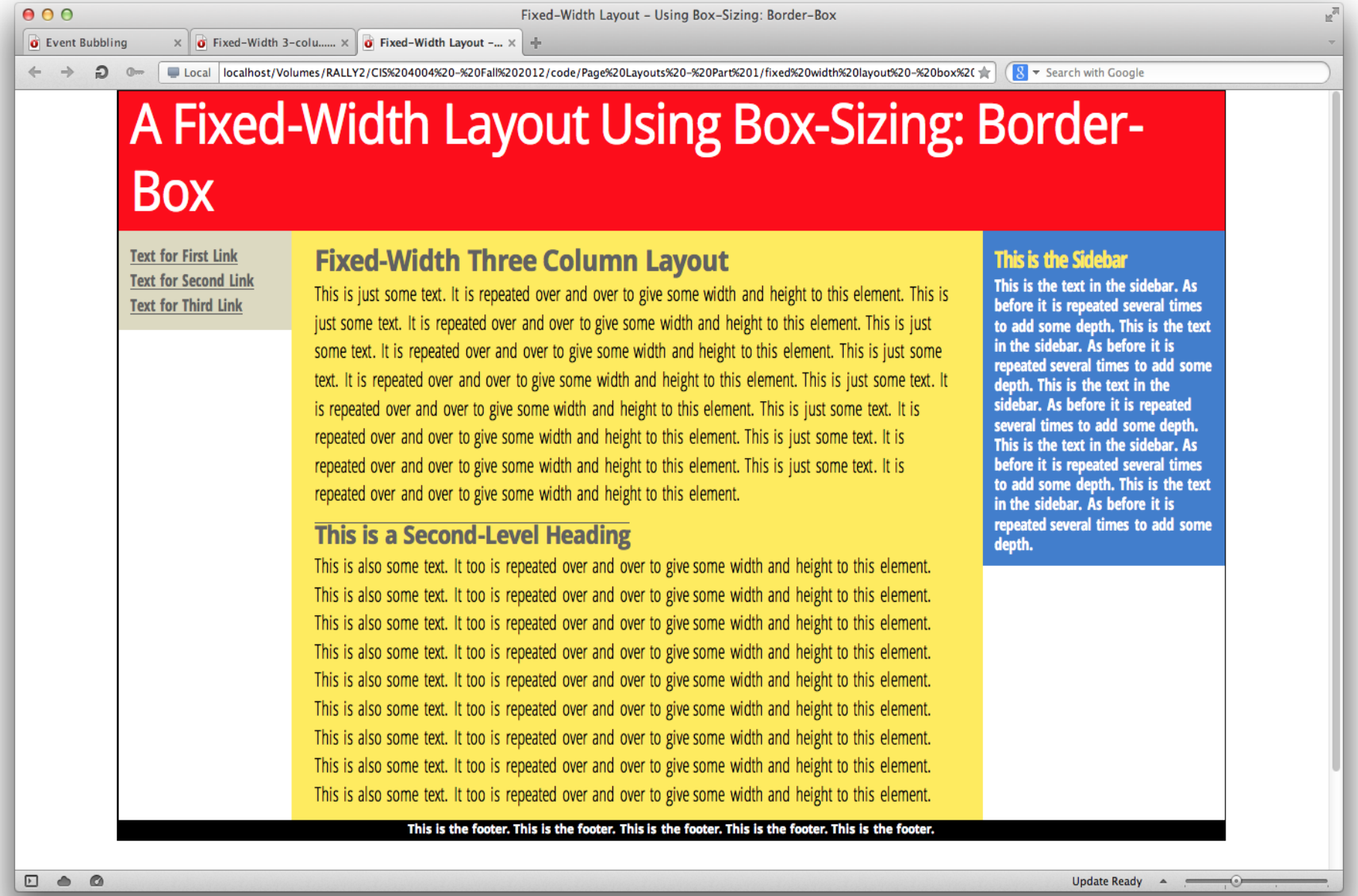
- The final technique for preventing float-slip in columnar layouts is a technique that is new with CSS3. As such, it will not be widely supported amongst older browsers. In particular, IE7 and older will require some JavaScript to be able to handle this technique. For now, let's focus on current browsers who will support this technique.
- CSS3 has a new property that can be applied to any block-level element in the markup. This new attribute is `box-sizing:border-box`.
- We'll simply add this property to each of the three floated columns, and you can then add the padding, and margins to the box without having to adjust the width of the columns to compensate, nor do you have to add inner `<div>` elements.

Fixing Some Issues – Solution 3

- When padding and margins are added to an element using this property, the content is automatically squeezed down instead.
- In effect, this property causes the same behavior of the columns as when we used the nested `<div>` technique, but now the markup is much cleaner and there are no nested `<div>` elements to deal with.
- The rendering of the document will look exactly the same as was the case when the nested approach was used, but the markup will appear much cleaner.
- The markup for this scenario is also available on the course web site, but the next page illustrates a sample of the relevant portions of the CSS for this new technique.

fixed width layout - box sizing with border box.html

```
        }
    article {
        box-sizing:border-box;
        width:600px;
        float:left;
        background:#ffed53;
        padding:10px 20px;
        }
    article h1 {
```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This is the Sidebar
This is the text in the sidebar. As before it is repeated several times to add some depth. This is the text in the sidebar. As before it is repeated several times to add some depth. This is the text in the sidebar. As before it is repeated several times to add some depth. This is the text in the sidebar. As before it is repeated several times to add some depth. This is the text in the sidebar. As before it is repeated several times to add some depth.
This is the footer. This is the footer. This is the footer. This is the footer. This is the footer.
Update Ready

Some additional padding illustrated on the center and right columns.
Notice that no float slip occurs and the content is squeezed into the smaller area.