CSS

LBSC 690: Jordan Boyd-Graber

October 8, 2012

Adapted from Dwight VanTuyl’s slides
Goals

- What browsers are out there (so you know what to test on)
- Main point: CSS gives you tools to change what your pages look like
- Phishing: using these powers for evil
- Hands on experimentation
1 Assignment 1

2 Ecosystem of Browsers

3 Phishing

4 CSS
What’s she doing?

Each square corresponds to a power of two - they add up to the decimal number of the board.
What’s she doing?

Each square corresponds to a power of two - they add up to the decimal number of the board.
What's she doing?

Each square corresponds to a power of two - they add up to the decimal number of the board.

\[2^{14} + 2^4 + 2^0 = 16384 + 16 + 1 = 16401\]
The difference of 3077 and 2053 is 1024, which is $2^{10}$. This corresponds to the second row, second column.
Question 2a

\[
\frac{1\text{TB}}{1} = 1
\]
Question 2a

\[
\frac{1\text{ TB}}{1} \cdot \frac{2^{10}\text{ MB}}{1\text{ GB}}
\]
Question 2a

\[
\frac{1 \text{TB}}{1} \cdot \frac{2^{10} \text{MB}}{1 \text{GB}} \cdot \frac{2^{10} \text{GB}}{1 \text{TB}}
\]
Question 2a

\[
\frac{1\text{TB}}{1} \cdot \frac{2^{10}\text{MB}}{1\text{GB}} \cdot \frac{2^{10}\text{GB}}{1\text{TB}} = 2^{20}\text{MB}
\]
$\frac{1 \text{TB}}{1} \cdot \frac{2^{10} \text{MB}}{1 \text{GB}} \cdot \frac{2^{10} \text{GB}}{1 \text{TB}} = 2^{20} \text{MB} = 1,048,576 \text{MB}$ (1)
Question 2a

\[
\frac{1\text{TB}}{1} \cdot \frac{2^{10}\text{MB}}{1\text{GB}} \cdot \frac{2^{10}\text{GB}}{1\text{TB}} = 2^{20}\text{MB} = 1,048,576\text{MB}
\] (1)

- Hard drive was: 1TB Serial ATA (7200RPM) w/DataBurst Cache, 9ms read time
- Fine to use \(2^{10}\) or \(10^3\) (but make sure you say which you’re using).
- If you use \(10^3\) or make other approximations, don’t keep around too many significant digits
  - \(0.001231129817 \rightarrow 0.0012\)
  - \(123,119,817 \rightarrow 120 \cdot 10^6\)
- Make sure units cancel
Question 2b

\[
\frac{1000 \cdot 10^3 \text{MB}}{1}
\]
Question 2b

\[
\frac{1000 \cdot 10^3 \text{MB}}{1} \cdot \frac{1 \text{min}}{1 \text{MB}}
\]
Question 2b

\[
\frac{1000 \cdot 10^3 \text{ MB}}{1} \cdot \frac{1 \text{ min}}{1 \text{ MB}} \cdot \frac{1 \text{ day}}{60 \cdot 24 \text{ min}} = \frac{1000000}{1440} \text{ day}
\]
Question 2b

\[
\frac{1000 \cdot 10^3 \text{MB}}{1} \cdot \frac{1 \text{min}}{1 \text{MB}} \cdot \frac{1 \text{day}}{60 \cdot 24 \text{min}} = \frac{1000000}{1440} \text{day} = 694 \text{day}
\]  

- Three minutes per song was a red herring
- Don’t forget units
- Conversion factors
Question 2c

\[
\frac{1000 \text{GB}}{1}
\]
There is no such thing as a half of a DVD (well, there is, but it’s useless).
How many bytes per record?

125 bytes

\[
\frac{125B \cdot 3 \cdot 10^8}{1} = 375 \cdot 10^9 \\
= 375 \text{GB}
\]
How many bytes per record?

125 bytes

$$\frac{125B \cdot 3 \cdot 10^8}{1} \cdot \frac{1GB}{10^9B}$$
How many bytes per record?

125 bytes

\[
\frac{125 \text{B} \cdot 3 \cdot 10^8}{1} \cdot \frac{1 \text{GB}}{10^9 \text{B}} = 37.5 \frac{10^9}{10^9} \text{GB}
\]
Question 3b

How many bytes per record?

125 bytes

\[
\frac{125B \cdot 3 \cdot 10^8}{1} \cdot \frac{1GB}{10^9B} = 37.5 \frac{10^9}{10^9} GB = 37.5 GB
\]  

- Write big numbers in scientific notation (million = 10^6)
- Careful with math
Question 3c-d

\[
\frac{37.5\text{GB}}{1000\text{GB}} \approx 3.8\% \quad (5)
\]
Question 3c-d

\[ \frac{37.5\text{GB}}{1000\text{GB}} \approx 3.8\% \]  

(5)

\[ \frac{37.5\text{GB}}{16\text{GB}} \approx 230\% \]  

(6)
Question 3c-d

\[ \frac{37.5\text{GB}}{1000\text{GB}} \approx 3.8\% \]  \hspace{1cm} (5)

\[ \frac{37.5\text{GB}}{16\text{GB}} \approx 230\% \]  \hspace{1cm} (6)

- 4GB DDR3 SDRAM - 3 DIMMs, 50ns read time
Question 3c-d

\[
\frac{37.5\text{GB}}{1000\text{GB}} \approx 3.8\% \quad (5)
\]

\[
\frac{37.5\text{GB}}{16\text{GB}} \approx 230\% \quad (6)
\]

- 4GB DDR3 SDRAM - 3 DIMMs, 50ns read time
- RAM amounts are usually given as cumulative (no penalty if you assume otherwise)
- Make sure answers are reasonable (if it doesn’t fit in RAM, it won’t fit in HD)
Question 3e-f

**Hard drive**

\[
\frac{3 \cdot 10^8 \text{ reads}}{1} \cdot \frac{9 \cdot 10^{-3} \text{s}}{\text{read}} = 27 \cdot 10^5 \text{s} \tag{7}
\]

\[
\frac{2.7 \cdot 10^6 \text{s}}{1} \cdot \frac{1 \text{ day}}{60 \cdot 60 \cdot 24 \text{s}} = 31.25 \text{ day} \tag{8}
\]

**RAM**

\[
\frac{3 \cdot 10^8 \text{ reads}}{1} \cdot \frac{50 \cdot 10^{-9} \text{s}}{\text{read}} = 150 \cdot 10^{-1} \text{s} = 15 \text{s} \tag{9}
\]

- Bonus points for looking up access time for 7200 RPM HD
- SI prefixes
Question 3e-f

Hard drive

\[
\frac{3 \cdot 10^8 \text{reads}}{1} \cdot \frac{9 \cdot 10^{-3} \text{s}}{\text{read}} = 27 \cdot 10^5 \text{s}
\]  \hspace{1cm} (7)

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\frac{2.7 \cdot 10^6 \text{s}}{1} \cdot \frac{1 \text{day}}{60 \cdot 60 \cdot 24 \text{s}} = 31.25 \text{day}
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RAM

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\]  \hspace{1cm} (9)

- Bonus points for looking up access time for 7200 RPM HD
- SI prefixes
Question 4

\[
\frac{200\text{GB}}{10\text{min}}
\]
Question 4

\[
\frac{200 \text{GB}}{10 \text{min}} \cdot \frac{10^3 \text{MB}}{\text{GB}}
\]
Question 4

\[
\frac{200\text{GB}}{10\text{min}} \cdot \frac{10^3\text{MB}}{\text{GB}} \cdot \frac{8\text{bit}}{\text{B}}
\]
This was to stress concept that moving data *anywhere* gives you a transfer rate

What about latency?

Mail and bike are often faster than the Internet

Home network speeds (100s of Mbs) are much faster than Internet (10s of Mbs if you’re lucky)

- Sneakernet
- Never underestimate the bandwidth of a station wagon full of tapes hurtling down the highway. — Tanenbaum, Andrew S.

Remember, bits $\neq$ byte
Metadiscussion

- Reasonableness
- Units
- When converting, only multiply by things that are equal to 1
- Scientific notation
Outline

1. Assignment 1
2. Ecosystem of Browsers
3. Phishing
4. CSS
Browser Engines

- Controls how you get from HTML file to what’s displayed on screen
- Hardest part to get right
- The interface (buttons, bookmarks, etc.) is more flexible (parallel with HTML / CSS)
- Because the underlying engine is the same, you don’t need to test every browser
- Images from webdesignerdepot
Engines

Desktop

Trident
Gecko
Webkit
Presto
KHTML
Prince
Cobra
Tasman
Mozilla
Lynx

Mobile

Trident
Gecko
Webkit
Presto
Lumi
Mango
Fugu
NetFront
OpenWave
jBS
WAP-WML
Engines

- Gecko - Apple
- Trident - Microsoft
- Webkit - Mozilla (formerly Netscape)
- Presto - Opera
- Lynx - GNU (text based)
Browser market share Apr. 2011

- Others: 48.9%
- Safari: 10.0%
- Firefox: 9.6%
- Other Browsers: 9.8%
- Chrome: 29.0%
Trident

- Windows
  - AOL Explorer
  - Avant Browser
  - Green Browser
  - Internet Explorer
  - iRider
  - Lunascape Genesis
  - Maxthon
  - Microsoft Outlook
  - MSN Explorer
  - RealPlayer
  - Sleipnir
  - Slim Browser
  - WebbIE
  - Winamp

- Mac
  - Microsoft Entourage
  - Internet Explorer
  - Discontinued

- Linux
  - MSN Explorer
  - Discontinued
  - IE Mobile

- Mobile
  - Tomb Raider
Gecko

- Windows
  - Flock
  - K-Meleon
  - Lunascape Genesis
  - Marthon
  - Miro
  - Mozilla Firefox
  - Mozilla Suite
  - Mozilla Thunderbird
  - Netscape 6+
  - SeaMonkey
  - Sleipnir
  - Yahoo! Browser

- Mac
  - Camino
  - Clamile
  - Flock
  - GNU IceCat
  - Miro
  - Mozilla Firefox
  - Mozilla Suite
  - Mozilla Thunderbird
  - SeaMonkey

- Linux
  - Flock
  - Galeon
  - GNU IceCat
  - IceWeasel
  - Miro
  - Mozilla Firefox
  - Mozilla Suite
  - Mozilla Thunderbird
  - SeaMonkey

- Mobile
  - Fennec
  - MicroB
  - Minimo
  - Mozilla Firefox
  - SkyFire
Webkit
Getting it right

- Develop in one browser
- When you have a draft, try it in other browsers
- Also try in different versions (particularly for IE)
- Test for compliance with CSS / XHTML
Outline

1 Assignment 1
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3 Phishing
4 CSS
What is phishing

1. Definition: “fishing” for personal information using a phony website
2. Multiple vectors of attack
3. Multiple endgames
Confirm your Bank of America credit/debit card details

This page is the beginning of the procedure for confirming your bank customer details. Please complete all the fields in the form below. All fields must be filled in. When you have finished entering the details, click on the "Confirm" button below the form to finish the confirmation procedure.

An asterisk (*) indicates a required field.

* Type of banking:
  - [ ] personal
  - [ ] small business
  - [ ] corporate & institutional

* Select your state: [Select your State]

* Your ATM or Credit Card Number: [Input field]

* Expiration date MM/YYYY: [Input field]

* Your ATM or Credit Card PIN: [Input field]

Secure Area

Bank of America, N.A. Member FDIC Equal Housing Lender © 2007 Bank of America Corporation. All rights reserved.
Phishing Vectors

1. Send you an e-mail claiming to be from a site, give you a link
2. Asks you explicitly for information claiming to be from a site
3. Impersonate a site on the internet
   - Poisoned DNS (e.g. at an internet cafe) - man in the middle
   - Have a confederate site (e.g. web commerce site)
Phishing Endgames

1. Install software
2. Watch your interactions with a trusted site (man in the middle)
3. Get your login
   1. Throw up phony page
   2. When you get it wrong, redirect to legit site
   3. Assuming you sometimes make mistakes, you might never notice
Outline

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4. CSS
What is CSS?

- **Cascading:** Multiple styles can overlap
- **Style:** CSS controls the presentation
- **Sheet:** CSS files are typically separate from the HTML file
Why CSS?

- Richer appearance
- Reduce workload
- Consistent style across pages
- Reduce download size
Why not use CSS?

- Very old browsers don’t support it (rare, and there are many other, bigger problems with older browsers)
- Makes it harder to create offline versions of pages (but most browsers offer to save all associated files)
- For layout, tables are arguably better
- Makes phishing easier
Download from bit.ly/pkNRkO
We’ll make this pretty through this class
If you look at the code, it’s very simple
Making HTML play nice with CSS

- Link from each page to (one or more) stylesheet(s)
- Order only matters if there are conflicts
- Should be in the "head"

```html
<link href="style1.css" rel="stylesheet" type="text/css" media="screen" />
```
“div” tag creates a box around content
You can give names to elements
We’ll see what this can do in a second
Creates logical division of page

```
<div id="footer">
Page by <a href="mailto:jbgr@umiacs.umd.edu">Jordan Boyd-Graber</a>
</div>
```
“span” itself does nothing
It allows a group of HTML to be modified by CSS
However, it’s meaningless semantically, so use it sparingly

```html
<span id="button">
  <ul>
    <li><a href="a.html">Alpacas</a></li>
    <li><a href="b.html">Bears</a></li>
    <li><a href="c.html">Cats</a></li>
    <li><a href="d.html">Dogs</a></li>
    <li><a href="e.html">Elephants</a></li>
    <li><a href="f.html">Ferrets</a></li>
  </ul>
</span>
```
“class” identifies what kind of an element it is
- It allows a **single tag** to be modified by CSS
- Unlike “id” it can (and should) be used more than once

```html
<p class="question">Why did the chicken cross the road?</p>
<p class="answer">To get to the other side.</p>
<p class="question">What kind of key opens a banana?</p>
<p class="answer">A monkey</p>
```
• **div** blocks of many HTML tags
• **id** for unique, single HTML tags
• **class** for repeated, single HTML tags
What does CSS look like?

- The **Selector** selects elements on the HTML page.
- The associated **Style Block** applies its **Style Values** to the selected Elements Properties.
Selector

- Select elements to apply a declared style.
- Selector types:
  - Element Selectors: selects all elements of a specific HTML type (body, h1, p, etc.)
  - Class Selectors: selects all elements that belong to a given class.
    - **CSS**: selectors that start with a period
    - **HTML**: set the *class* attribute to the selector
  - ID Selectors: selects a single element that has been given a unique id.
    - **CSS**: selectors that begin with 
    - **HTML**: set the *id* attribute to the selector
  - Pseudo Selectors: combines a selector with a user activated state :hover, :link, :visited
Color and decoration

/*
 * Links should normally not be underlined unless
 * hovered over
 */

a {
  color: #ff6666;
  text-decoration: none;
}

a:hover {
  text-decoration: underline;
}
Background and paragraphs

/*
 * By default, have black sans serif text on a gray background.
 */

body {
    background-color: #e1ddd9;
    font-size: 12px;
    font-family: Verdana, Arial, Sans-Serif;
    color: #000000;
    margin: 0;
}

/*
 * Paragraphs should have a little more spacing and indentation
 */
p {
    margin: 0px;
    padding: 5px 20px 5px 20px;
    text-indent: 10px;
    text-align: justify;
}
Fonts

- Changing font face
  - Generic family: Serif, Sans-Serif, Monospace
  - Font family: “Times New Roman,” “Arial,” or “Courier”
  - Can specify multiple - it will keep trying until it finds one

- Changing font size
  - 1em is equal to “m” in current font size (default is 16 pixels)
  - Can also use “pt”, but discouraged
  - Can also use percent
- text-indent: indents first line of a paragraph according to size
- text-align: right; or left; or center; or justify;
- text-decoration: none; or underline;
- text-transform: Capitalize;
- Line-height: added vertical space to each line of text according to size
Background

- `background-image: url(../location/of/image.jpg)`
- `background-repeat: tile` image in background
- `background-position: vertical (top, center, bottom, or size) horizontal (left, center, right, or size)`
- `background-attachment: (scroll or fixed)`
Boxing, margins, and transformation

/*
 * Create a footer that gives contrast
 */

#footer {
    font-size: 13px;
    font-weight: bold;
    text-transform: uppercase;
    text-align: right;
    background-color: #90897a;
    padding: 5px 15px;
    margin: 0px;
}

Jokes

Why did the chicken cross the road?
To get to the other side.
What kind of key opens a banana?
A monkey
Margin vs. padding
Arranging content on the page

/*
 * Create two columns on either side of
 * the main body of the page. They will
 * not occupy the full height (unless the
 * content is very skimpy). Thus if they
 * have background, they should be the
 * same as body.
 */

#left, #right {
    /*
     * background-color: red;
     */
    position: absolute;
    margin: 0px;
    padding-top: 40px;
    color: #564b47;
    width: 100px;
}

#left {
    left: 0px;
}

#right {
    right: 0px;
}
Arranging content on the page

/*
 * Set the content to have decent
 * padding and margins and a white
 * background. The bottom padding
 * is important for the footer not
 * encroaching on the left navigation.
 */

#content, #picture {
    margin: 0px 115px 0px 110px;
    border-left: 2px solid #564b47;
    border-right: 2px solid #564b47;
    background-color: #ffffff;
}

#content {
    padding-bottom: 35px;
}

#picture {
    padding-bottom: 0px;
}
Aligning text

h1, h2, h3, h4, h5 {
  padding-top: 5px;
  padding-left: 15px;
  padding-right: 5px;
  padding-bottom: 1px;
  text-transform: uppercase;
  color: #564b47;
  background-color: transparent;
}

h3, h4, h5 {
  text-align: center;
}

#header {
  text-transform: uppercase;
  text-align: right;
  color: #564b47;
  background-color: #90897a;
}

nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur?

JOKES

Why did the chicken cross the road?
JOKES

Why did the chicken cross the road?
To get to the other side.
What kind of key opens a banana?
A monkey
Fancy display

/*
 * Changes the font and sets the width
 */

#button {
    width: 190px;
    padding: 0;
    font-family: 'Trebuchet MS', 'Lucida Grande',
                Verdana, Lucida, Geneva, Helvetica, Arial,
                sans-serif;
}

/*
 * Makes the links appear as a block and gives
 * them a border, removes underlining of links.
 */

#button li a {
    display: block;
    padding: 5px 5px 5px 0.5em;
    border-left: 10px solid #ff0000;
    border-right: 10px solid #ff4444;
    background-color: #cc9999;
    color: #ffffff;
    text-decoration: none;
}
Changing lists

/*
 * Changes the color of the link on a hover
 */
#button li a:hover {
    border-left: 10px solid #ff1111;
    border-right: 10px solid #ff5555;
    background-color: #ccaaaa;
    color: #ffffff;
}

/*
 * Removes padding from left hand side and hides bullets
 */
#button ul {
    list-style: none;
    padding: 0em;
}

/*
 * Adds a border to the bottom of the buttons
 */
#button li {
    border-bottom: 1px solid #90bade;
}
Display controls what the element looks like

- “block” has line break before and after
- “table” can make it appear like a table
- “none” can make it disappear
Recap

- The Browser ecosystem
- Style for evil
- Style for good
This Week’s Discussion

Readable CSS

Take a look at this snippet of HTML from the NY Times (below). What’s going on? Why? Take a look at the style sheet:
http://graphics8.nytimes.com/css/0.1/screen/common/global.css
Do you have any questions? What do you think of it?

```html
<link rel="stylesheet" type="text/css" href="styles.css">
<!--[if IE]>
  <style type="text/css">
    @import url(ie.css);
  </style>
<![endif]-->
<!--[if IE 6]>
  <style type="text/css">
    @import url(ie6.css);
  </style>
<![endif]-->
```
This Week’s Discussion

Remember when we prosecuted Microsoft for bundling a browser with an OS?

Imagine the future we’d live in if we’d been willing to let one tech company amass that much power.

Thank God we nipped that in the bud.