SY306
Web & Databases for Cyber Operations

Spring 2015

Assoc. Prof. Adina Crăiniceanu


Outline

• Class Survey / Role Call
• What is:
  - web programming
  - databases
  - this class?
• Course Admin
  – Syllabus
  – Policy
  – Tips
• HTML5
Web vs. Internet

- Internet – collections of computers/devices that can communicate
  - telnet, ftp, SMTP(mail)

- Web – software/protocols that has been installed on (most of) these computers
  - http / https
Client/Server Computing

Computation can occur in ____________ location

Things we’ll learn and do

• HTML5 – basics, tables, forms
• Cascading Style Sheets
• JavaScript, Dynamic HTML
• CGI / Python
• Databases – Relational Model
• SQL
• Web applications with database back-end
• Web based attacks (XSS, SQL injections,...)
Things we won’t have time for

- Not fully supported HTML 5 features
- Not fully supported CSS 3 features
- ASP, .NET
- jQuery
- PHP
- Database design (ER model), normalization, etc

Admin – Assignments

- Assignments will be on the course calendar
- First homework – email due Thursday by 0900
  - Read course policy
  - Read Lab Guidance (on the web) – pick a topic
  - Email topic to instructor (subject: “SY306 Lab topic”)
- First reading – due next Monday (quiz)
  - Skim chapter 1
  - Read chapter 2.1-2.9
- Deadlines
  - Reading (+ quiz) – often Monday, but see calendar
  - Lab – usually due Thursday 2359 (electronically). Hard copy before lab on Friday
- Late assignments – -10%, -25%, not accepted
Admin - Policy

• Workload:
  – Readings
  – Quizzes
  – Labs: start in class, usually finish outside class
  – Projects
  – Exams

• Collaboration

• Honor

• Class/lab behavior

Success in SY306

• Do the reading (don’t forget online quizzes!)
  – Brief lecture to highlight key points

• Lecture – stay engaged
  – Ask & answer questions
  – Take notes – provided slides are not enough!
  – Exams closed-book – but open-note!

• Make the most of in-class lab time
  – Read lab in advance
  – Think before you start typing
  – Don’t stay stuck!

• Don’t fall behind
  – Finish lab early and leave time for reading
  – See me for help and/or talk to friends
  – Course material builds on itself and gets more complex
2.1 Introduction / 2.2 Editing HTML5

- HTML 5 (HyperText Markup Language 5)
  - A markup language that specifies the *structure* and *content* of documents
  - Separates document presentation from information
  - Standard defined by W3C

- HTML documents
  - Source-code form
  - Text editor (e.g. Notepad, Wordpad, emacs, etc.)
  - .html or .htm file-name extension
  - Web server – stores HTML documents
  - Web browser – requests HTML documents

Basic Syntax

```html
<a href="links.html"> Useful links </a>
```

```html
<br /> or <br>
```
2.4 W3C HTML5 Validation Service

- Validation service (validator.w3.org)
  - Checking a document’s syntax
  - Provide URL (not intranet), upload file, or direct input
- Local validation service
Block vs. inline tags in HTML5

• Block tags
  – Start their content on a new line

• Inline tags
  – Their content continues on the same line

• Restrictions
  – Inline tags (and text) must be nested inside block tags, not
directly under <body> or <form>

  – Block tags cannot be nested inside inline tags
    ILLEGAL: <em> <h1> Foo </h1> </em

2.5 Headers – h1 to h6

```html
<!DOCTYPE html>
<!-- Fig. 2.2: heading.html -->
<!-- Heading elements h1 through h6. -->
<html>
<head>
  <meta charset = "utf-8">
  <title>Headings</title>
</head>
<body>
  <h1>Level 1 Heading</h1>
  <h2>Level 2 heading</h2>
  <h3>Level 3 heading</h3>
  <h4>Level 4 heading</h4>
  <h5>Level 5 heading</h5>
  <h6>Level 6 heading</h6>
</body>
</html>
```
2.6 Linking

• Hyperlink
  – References other sources such as HTML documents and images
  – Both text and images can act as hyperlinks
  – Created using the a (anchor) element
    • Attribute href
      – Specifies the location of a linked resource
    • Link to e-mail addresses using mailto: URL

```html
<!DOCTYPE html>

<!-- Fig. 2.3: links.html -->
<!-- Linking to other web pages. -->
<html>
  <head>
    <meta charset = "utf-8">
    <title>Links</title>
  </head>
  <body>
    <h1>Here are my favorite sites:</h1>
    <p><strong>Click a name to visit that site.</strong></p>
    <!-- create four text hyperlinks -->
    <p><a href = "http://www.facebook.com">Facebook</a></p>
    <p><a href = "http://www.twitter.com">Twitter</a></p>
    <p><a href = "http://www.foursquare.com">Foursquare</a></p>
    <p><a href = "http://www.google.com">Google</a></p>
  </body>
</html>
```
Relative vs. Absolute Links

- Absolute links
  <a href="http://www.usna.edu/CS/">Computer Science Dept</a>
  <a href="http://www.nytimes.com">NYT</a>

- Relative links
  <a href="textbooks.htm">Textbooks</a>
  <a href="../textbooks.htm">Textbooks</a>
  <a href="../common/dogs.html">More on dogs</a>

2.7 Images

```html
<!DOCTYPE html>

<head>
  <meta charset = "utf-8">
  <title>Images</title>
</head>

<body>
  <p>
    <img src = "cpphtp.png" width = "92" height = "120"
         alt = "C++ How to Program book cover">
    <img src = "jhtp.png" width = "92" height = "120"
         alt = "Java How to Program book cover">
  </p>
</body>
</html>
```
2.9 Lists

- **Unordered list element `ul`**
  - Creates a list in which each item begins with a bullet symbol (called a disc)
  - `li` (list item)
    - Entry in an unordered list

- **Ordered list element `ol`**
  - Creates a list in which each item begins with a number

- Lists may be nested to represent hierarchical data relationships

```html
<!DOCTYPE html>
<html>
<head>
    <meta charset = "utf-8">
    <title>Links</title>
</head>
<body>
    <h1>Here are my favorite sites</h1>
    <p><strong>Click on a name to go to that page</strong></p>
    <!-- create an unordered list -->
    <ul>
        <!-- the list contains four list items -->
        <li><a href = "http://www.youtube.com">YouTube</a></li>
        <li><a href = "http://www.amazon.com">Amazon</a></li>
        <li><a href = "http://www.linkedin.com">LinkedIn</a></li>
    </ul>
</body>
</html>
```

Here are my favorite sites
Click on a name to go to that page
- YouTube
- Wikipedia
- Amazon
- LinkedIn
Exercise #1 – Correct any invalid HTML 5 syntax

```html
<!DOCTYPE html>
<!-- An example file
<!-- Our first Web page -->
<html>

<body>
  <h1> Welcome to <b> SY306! </b> </h1>
  <h2> Today’s Agenda </h2>
  <li> HTML5 </li>
  <li> JavaScript </li>
</body>
</html>
```

Exercise #2 – Correct any invalid HTML 5 syntax

```html
<!DOCTYPE html>
<html>

<title>Internet and WWW How to Program - Welcome</title>

<body>
  <img src = "xmlhtp.jpg" height = "238" width = "183" >

  <h1 align="center">Under construction</h1>

</body>
</html>
```
Exercise #3 – Correct any invalid HTML 5 syntax

```html
<html>
<head>
  <title>Internet and WWW How to Program - Links</title>
</head>
<body>
  <b>Here are my favorite links</b>
  <p><a href = "http://www.yahoo.com">Yahoo!</a></p>
  <p><a mailto = "webmaster@ussmichigan.org">Webmaster</a></p>
</body>
</html>
```

Exercise #4 – Correct any invalid HTML 5 syntax

```html
<!DOCTYPE html>
<html>
<head>
  <title>Best features of the Internet</title>
</head>
<body>
  <ul>
    <li>Meet new people from around the world.</li>
    <li>Access to new media as it becomes public:</li>
    <ul>
      <li>New games</li>
      <li>New applications & software</li>
    </ul>
    <li>Search engines</li>
  </ul>
</body>
</html>
```
Web Resources

- Google
- www.w3.org/TR/html5
- http://www.w3schools.com/html/default.asp
- validator.w3.org