CET214

Web Programming

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CET214

Web Programming

Lecture 2: HTML

Today's Agenda

Introductions

Course Overview

Webpages and The Internet

How things are going so far

- Engagement
    - Lecture (lots of good questions and participation)
    - Section (practical, people working together in breakouts)

Github

- Github Repository access
- https://github.com/dr-ahmed-said/web-programming
- Fork the course repository and submit your course work in your fork/branch
- Your work will be **monitored** and **graded**

Review: The Internet

- The internet is a massive global network that connects millions of private, public, academic, business, and government networks worldwide.

- It allows computers and other devices to communicate with each other.

- A connection of computer networks using the Internet Protocol (IP)

- Layers of communication protocols:
   - IP → TCP/UDP → HTTP/FTP/POP/SMTP/SSH...

Review: The Internet

- There are layers
- IP (Internet Protocol) addresses: like 192.168.0.1
- No centralized control but...
    - DNS maps the numbers to names like Google.com
    - Webserver serve the webpages
    - Web browsers display the webpages
- Websites use a client-server model over the Internet
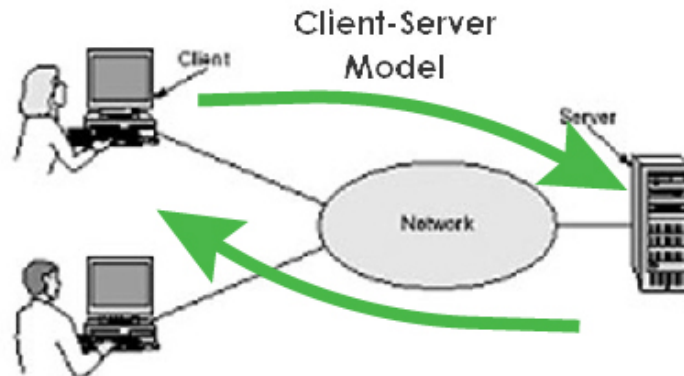
Layers of Protocol

- IP (Internet Protocol) - the network layer

- TCP (Transmission Control Protocol) - the transport layer

- HTTP (HyperText Transfer Protocol) - the application layer
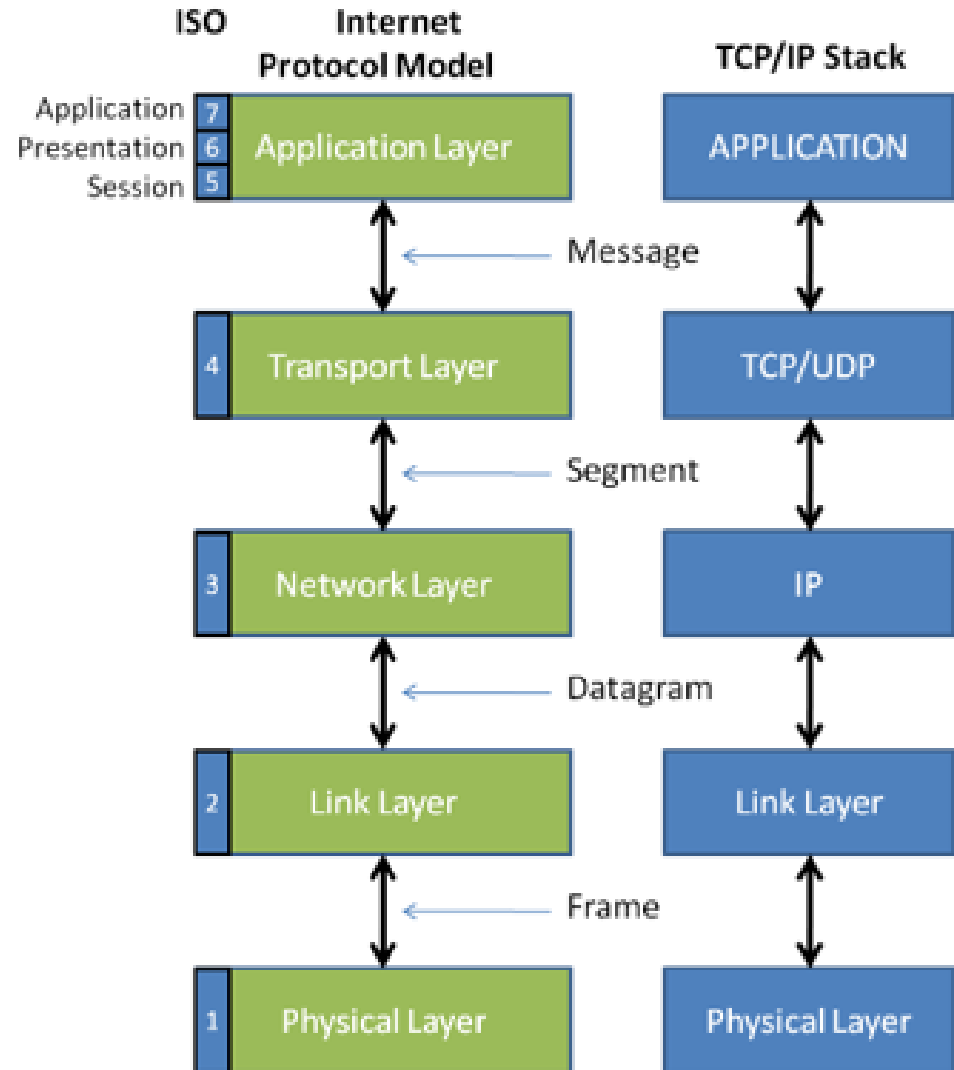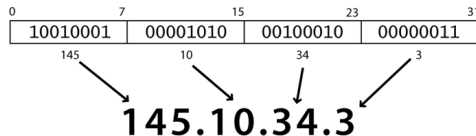
Who "runs" the internet?

- There is no single entity that runs the internet
- There are organizations that help maintain the internet's infrastructure
- ICANN is responsible for managing the Domain Name System (DNS)
- Internet Engineering Task Force (IETF) develops and promotes Internet standards
- World Wide Web Consortium (W3C) develops web standards

Brief History

- 1969: ARPANET, the first network to use the Internet Protocol Suite
- 1989: Tim Berners-Lee invents the World Wide Web
- 1991: The first website goes live
- 1993: The first graphical web browser, Mosaic, is released
- 1994: The World Wide Web Consortium (W3C) is founded
- 1994: **Netscape** web browser is released
- 1995: The Internet Explorer web browser is released
- 2004: Facebook is founded
- 2005: YouTube is founded
- 2008: Google Chrome web browser is released
- 2010: Instagram is founded
- 2011: Snapchat is founded
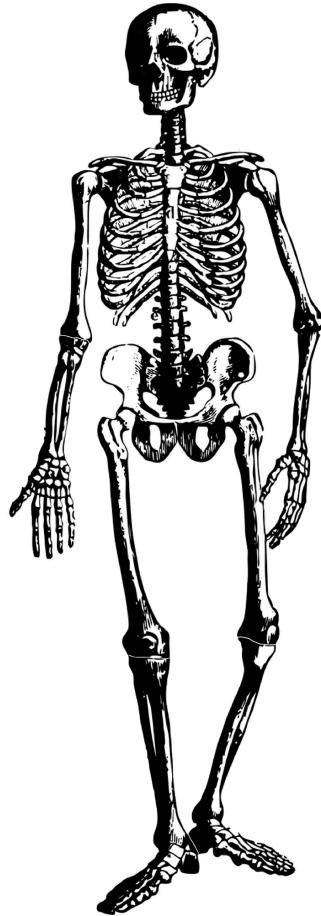- 2019: TikTok is founded
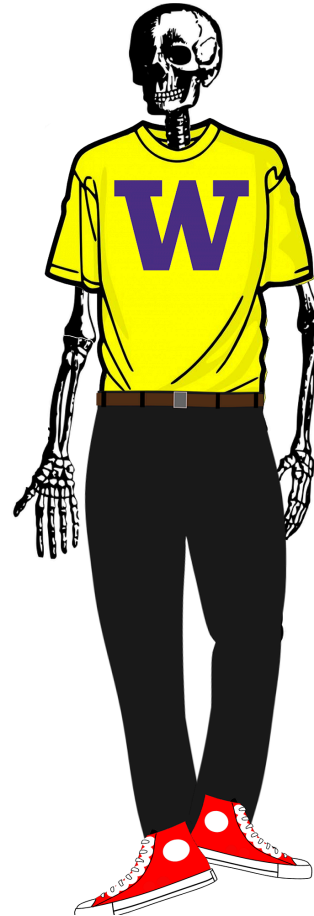
Review: Websites
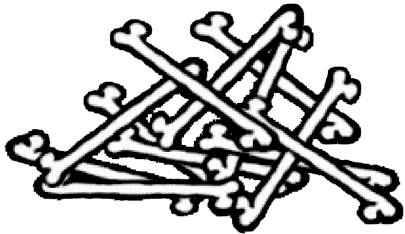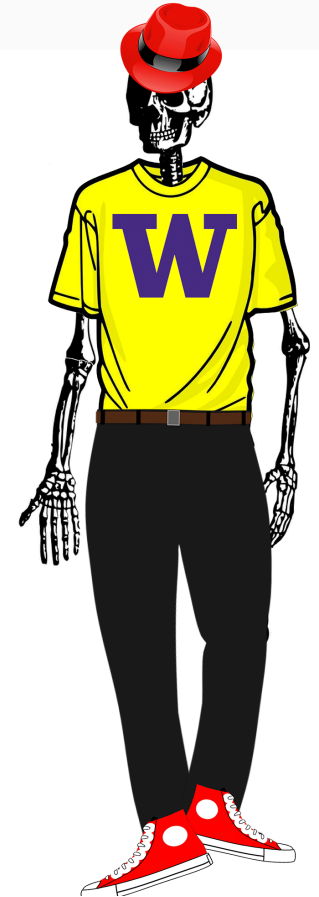
Content	Structure	Style	Behavior
Words and images	HTML	CSS	JavaScript & Server programs
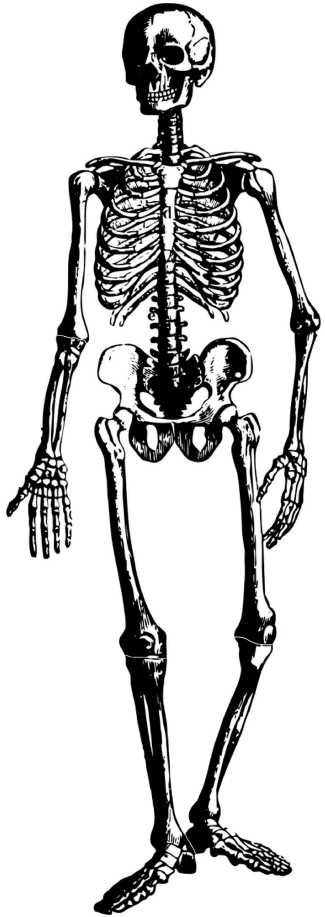
HTML

Hypertext Markup Language (HTML)

Describes the *content* and *structure* of information on a web page

- Not the same as the *presentation* (appearance on screen) - that's where CSS will come in!

There are a *ton* of HTML tags, but the most important thing is to use ones that are semantically appropriate, and meet current web standards.

MDN is really the only resource you should use outside of this class for looking up specific tags.

Basic Structure of an HTML Page

```html
<!DOCTYPE html>
<html>
  <head>
    information about the page
  </head>
  <body>
    page contents
  </body>
</html>
```
HTML

The `<head>` tag describes the page and the `<body>` tag contains the page's content

An HTML page is saved into a file ending with extension `.html`

The `DOCTYPE` tag tells the browser to interpret our page's code as HTML5, the lastest/greatest version of the language

You don't need to be an artist.
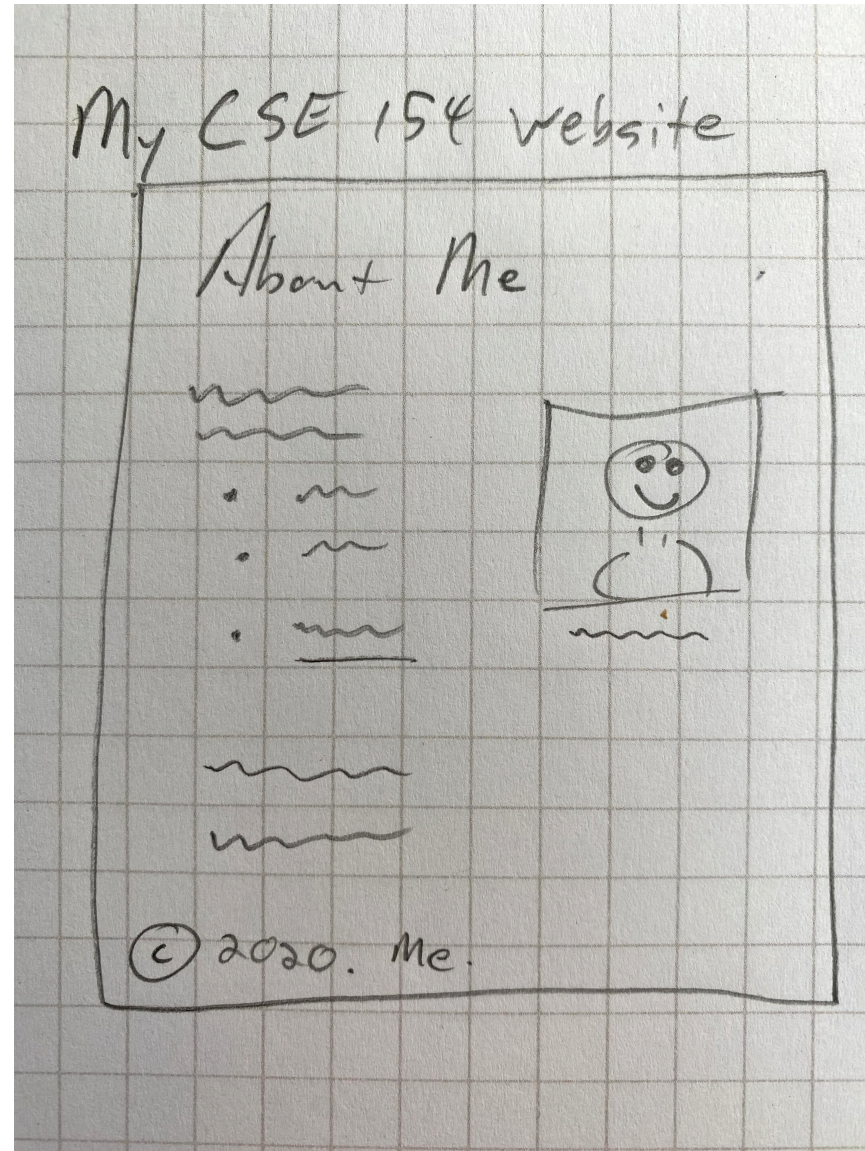
Web Development Tools

We will be using the following web development tools:

- A browser to view and debug webpages
  - Chrome,
  - Edge,
  - Firefox,
  - ...

- IDE: a text editor to write HTML/CSS/JS/...
  - "VSCode (with various helpful packages available),
  - WebStorm,
  - Text Editors: Notepad, Notepad++, ...
  - ...

Some Important HTML Details

HTML Tag Attributes

Some tags can contain additional information called **attributes**

- Syntax:
  `<element attribute="value" attribute="value"> content </element>`
- Example:
  `<a href="my-other-page.html">Next page</a>`

Some tags don't contain content and can be opened and closed in one tag (self-closing or "void")

- Syntax:
  `<element attribute="value" attribute="value">`
- Example:
  `<br>, <hr>`
  - You may see things like <br />, <hr /> around. These are from different (usually older) types of HTML. In HTML5, the `/` is optional and ignored.

- Example:
  `<img src="bunny.jpg" alt="pic from Easter">`

Page Title

Describes the title of the webpage

```
<title>Chapter 2: HTML Basics</title>
```

Placed within the head of the page

Displayed in the web browser's title bar and when bookmarking the page
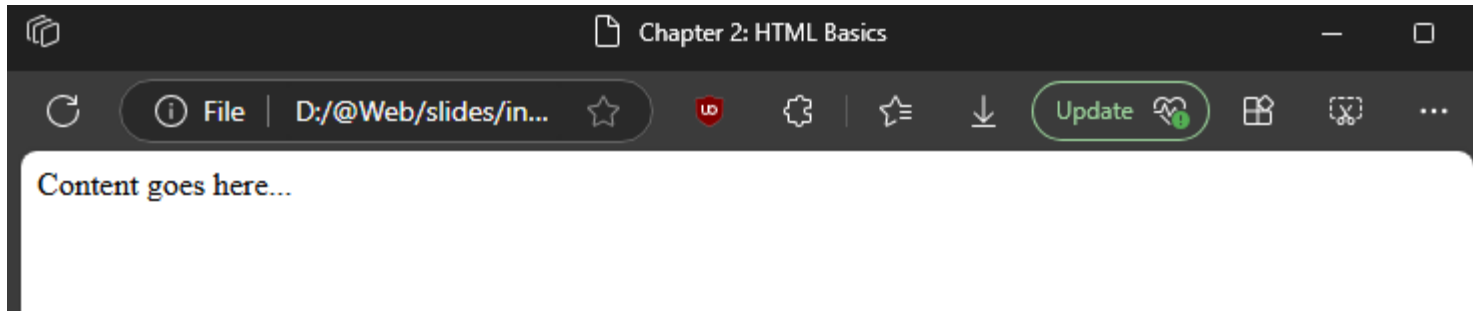
Paragraph

Defines a paragraph of text

```
<p>
        This is a paragraph of text.
</p>
```

This is a paragraph of text.

- Block-level element
- Automatically adds space above and below the paragraph
- Placed within the body of the page

Headings

Defines headings of different sizes

```
<h1>University</h1>
<h2>Department of Computer Science</h2>
<h3>Web Programming Courses</h3>
<h4>Cairo</h4>
<h5>Tuesday</h5>
<h6>12:00 PM</h6>
```

Headings

Defines headings of different sizes

University

Department of Computer Science

Web Programming Courses

Cairo

Tuesday

12:00 PM

Links (Anchors): `<a>`

links, or "anchors", to other pages (inline)

```html
<p>
  Search for it on <a href="http://www.google.com/">Google</a>!
</p>
```
HTML

Search for it on Google!

output

Uses the `href` (Hypertext REFerence) attribute to specify the destination URL

- Can be absolute (to another web site) or relative (to another page on this site)

Anchors are inline elements; must be placed in a block element such as `<p>` or `<h1>`

Images: `<img>`

Inserts a graphical image into the page (inline)

```html
<img src="img/html5.jpg" alt="HTML5 Logo" title="Logo">
```
HTML

output

The `src` attribute specifies the image URL

Motivating alt text

HTML5 also requires an `alt` attribute describing the image, which improves accessibility for users who can't otherwise see it.

The value of the `alt` attribute is also what you see if the image is not successfully loaded.

```html
<img src="img/html.png" alt="HTML5 Logo" title="Logo">
```

More About Images

```html
<a href="https://github.com/dr-ahmed-said/web-programming">
  <img src="img/course-logo.png" alt="Course Logo" title="Logo">
</a>
```

Course Logo

If placed in an `<a>` anchor tag, the image becomes a link.

Relative vs. Absolute Paths for Links and Images

Relative: paths are relative to the document linking to the path.

- Linked files **within the same directory**: `"filename.jpg"`

```
<a href="my-other-page.html">Check out my other page!</a>
```

- Linked files within a subdirectory (e.g. "img") `"img/filename.jpg"`

```
<img src="img/koala-with-leaf.png" alt="A Koala with a leaf" title="Logo">
```

Absolute: paths refer to a specific location of a file, *including the domain and protocol*.

- Typically used when pointing to a link that is published online (not within your own website).

- Example: `"https://validator.w3.org/"`

Citing External Material

How to cite images that aren't yours?

```html
<figure>
  <!--
    Image source: Wikipedia, Made by User:Golbez
    [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0/)]
  -->
  <img src="https://upload.wikimedia.org/wikipedia/commons/thumb/3/3b/Australia_states_blank.png/257px-Austra
       alt="Koala-land map">
  <figcaption>Koalas live in Australia</figcaption>
</figure>
```
HTML

See slides **below** for how to get the citation image for this Wikimedia image.

In your CP's, you must cite all resources that were not original (and you should give your own images credits) either on the page (as in about.html or in a footer) and/or in the page source code.

Getting the CC citation info from a public Wikimedia source

 Getting citation information from Wikimedia page

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