LECTURE 34

PLANNING OUR WEB APPS

MCS 275 Spring 2021
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LECTURE 34: PLANNING OUR WEB APPS

Course bulletins:

- Please install **Flask**, e.g. with

  ```
  python3 -m pip install Flask
  ```

  in preparation for using it in upcoming assignments.

- Worksheet 12 covers databases. Do you want to install the sqlite command line shell? It's optional.

- More about Project 4 soon (description release planned for April 12).

TODAY

Create the rough design for two web applications we'll write in Python in the next few lectures.

Continue study of HTML and CSS by making some mockups of the user interfaces.

WHY HTML, CSS, WEB APPS?

There are whole courses about these topics[*], and in MCS 275 we're only covering them in a superficial, crash-course manner.

Why are they here at all?

- Everyone should know a little HTML+CSS
- "Webdev" is a major software engineering domain
- Good way to demonstrate use of databases
- Can code examples with useful final product

[*] e.g. IT 202

TOY MODELS

I will prioritize getting a working product that uses things we've discussed in the course.

That will mean skipping some natural features (e.g. authentication) and avoiding some technologies because they'd take too long to introduce (e.g. JS), or because they'd hide the way of course concepts are being used (e.g. SQLAlchemy).

APP 1: CHAT ROOM

Users open a URL in their browser and are connected to a page where they can read and post text messages.

The recent messages are displayed to everyone, in chronological order.

Toy model of IRC, AIM, GroupMe, Discord, Slack, …

APP 2: POST AND VOTE

Users submit items (text that fits an app-specific theme), view items, and vote (+/-) on items.

Items can be viewed in order of vote score (best first) or in chronological order.

Toy model of Slashdot, Reddit, Stack Exchange, Hacker News, Lobsters ...

Chat app name?

Let's try something like businessnamegenerator.com

Post and Vote app theme/name?

MY PROPOSAL

Whinge: Post your pet peeves, vote for those that you find particularly relatable. Amusement ensues.

Sample whinge: When someone in front of you on the stairs stops to check their phone.

(Seriously, why do people do this?)

UI MOCKUPS

Let's make some HTML+CSS documents that look like the applications we're planning to build.

Later, we'll use these as the starting point for the HTML the apps will generate.

CSS

A language that styles HTML. Basic syntax is

```
SELECTOR {
    PROPERTY1: VALUE1;
    PROPERTY2: VALUE2;
}
```

Elements that match the SELECTOR will have their styling changed by adjusting values of the given properties (things like color, font size, border).

CSS has a complex system of units for values like distances and sizes.

```css
body {
    font-family: "Verdana", sans-serif;
    background: #C0C0C0;
}
p {

    border: 1px solid #000000;

}
```

The body element of the document (hence everything) will use the font called "Verdana", or if that isn't available, some sans serif font.

The body will be displayed with a light gray background.

Each paragraph will be surrounded by a 1-pixel black border.

CSS PROPERTIES

There are lots, e.g. `color`, `background`, `font-family`, `font-size`, `width`, `height`, `border`, `margin`, `margin-top`, `margin-left`, `padding`, `padding-left`, `...`

CSS properties reference at w3schools

APPLYING A STYLESHEET

You can embed a stylesheet (block of CSS) directly in HTML by placing it inside `<style>` within `<head>`.

Or you can use the HTML `<link>` tag to specify the CSS can be found at another URL (e.g. is in another file).

```
<link rel="stylesheet" href="mysite.css">
```

Like `<style>`, `<link>` should go in the header.

The latter approach makes stylesheets reusable.

ID

An HTML element in a document can be given a unique identifier with the `id` attribute.

```html
<p id="selector-intro">Let's talk about CSS selectors...</p>
```

If two elements have same `id`, your HTML is invalid.

You can link to an element within a document by id e.g.

```html
We discuss <a href="#selector-intro">selectors</a> below.
```

CLASS

You can create **classes** (categories) for elements in a HTML document. Mainly used so items in a category (e.g. important, outdated, footnote) can be styled differently (e.g. red, faded, small text).

Specify the category of an element using the `class` attribute.

```html
<p class="urgent-warning">Space wasps approaching.</p>
```

No need to declare classes in advance, nor to refer to every class in your CSS.

CLASS AND ID SELECTORS

Apply class- or id-specific styles in CSS:

```css
/* Text in paragraphs is orange */
p { color: #FFA500; }

/* Paragraphs of class "urgent-warning" have big, red
   text. This overrides the previous line, as the more
   specific selector gets precedence.   */
p.urgent-warning { color: #FF0000; font-size: 120%; }

/* The paragraph with id "selector-intro" is bold */
p#selector-intro { font-weight: bold; }
```

CHILD AND DESCENDANT SELECTORS

```css
div ul {
    /* style for any ul that has
       a div ancestor */
}
div > ul {
    /* style for any ul that has
       a div as its parent */
}
ul ul {
    /* style for ul inside another ul */
}
```

MANY OTHER SELECTORS

`first-child, only-child,` selection by adjacency, values of attributes, ...

w3schools CSS selectors reference

PYTHON'S BUILT-IN HTTP SERVER

```
python3 -m http.server
```

Opens a web server that serves files in the current directory and its subdirectories.

Visit `http://localhost:8000/` in a browser (or substitute other port number shown in startup message) to see `index.html`.

Firewall rules typically prevent incoming connections from the internet (and maybe the local network too). That's good! Or

```
python3 -m http.server --bind 127.0.0.1
```

will make sure it **only** listens for connections from the same machine.

REFERENCES

- HTML tutorial from w3schools

- CSS tutorial from w3schools

- A Guide to HTML5 and CSS3 - no-cost PDF ebook from 2014 that is good for self-study; must enter an email address to download

- Countless web design books in the O'Reilly technical library (free to anyone with a UIC email address).

REVISION HISTORY

- 2021-04-07 Initial publication