

Client-Side Web Programming: CSS

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Robert M. Dondero, Ph.D.
Princeton University

Objectives

- We will cover:
 - How to make good looking **responsive** web apps

Objectives

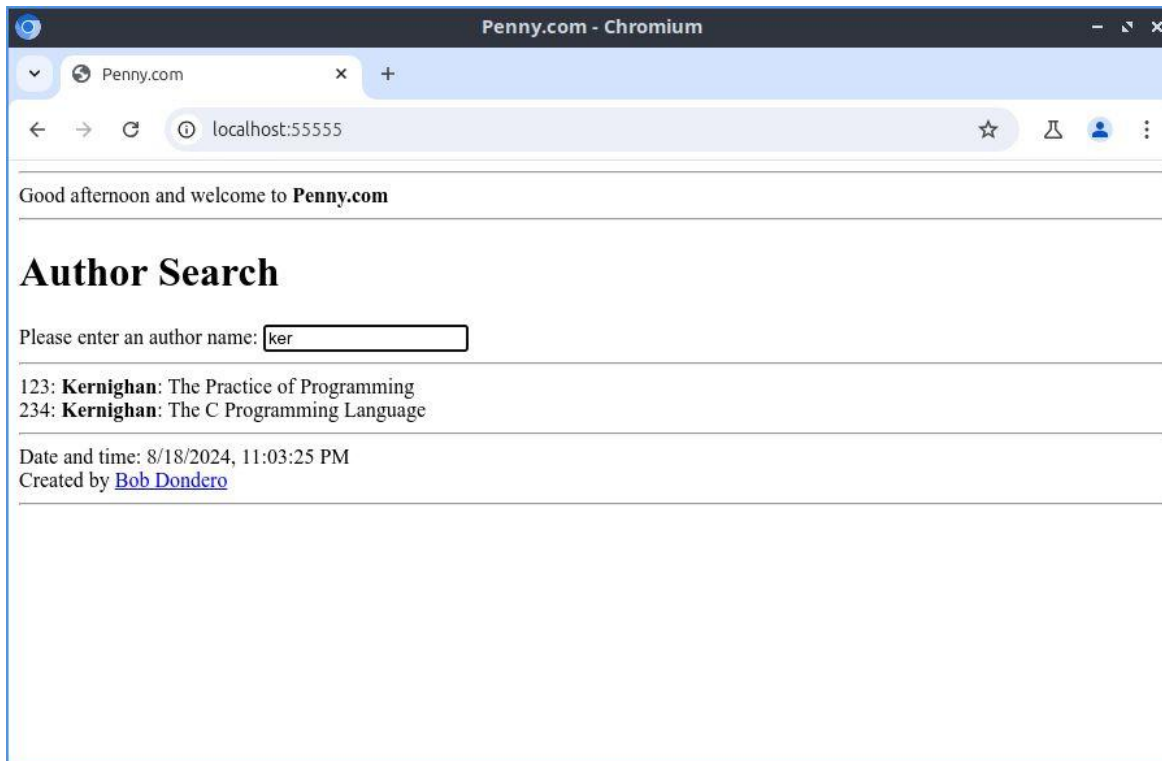
- We will cover:
 - The smartphone viewport
 - Cascading style sheets (CSS)
 - Responsive web apps
 - CSS libraries

Agenda

- **The smartphone viewport**
- CSS
- Responsive web apps
- CSS libraries

Smartphone Viewport

- Recall PennyAjax4 app
 - Laptop computer (large browser window)



OK

Smartphone Viewport

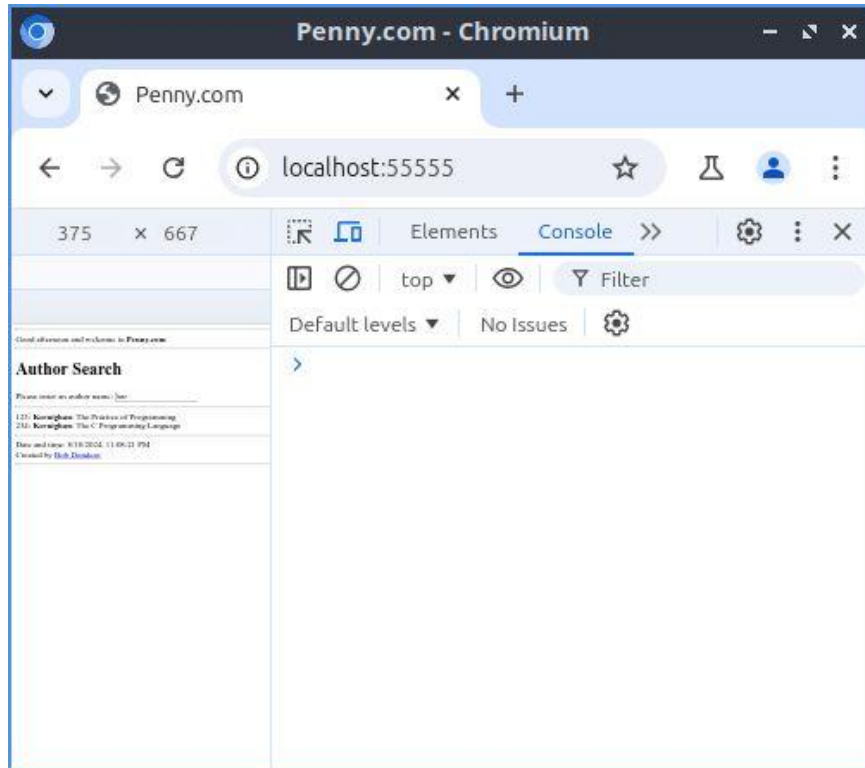
- Recall PennyAjax4 app (cont.)
 - Laptop computer (small browser window)



OK

Smartphone Viewport

- Recall PennyAjax4 app (cont.)
 - Smartphone (very small browser window)



Chrome: More tools -> Developer Tools

Unacceptable

Smartphone Viewport

Original problem: Truncation

Laptop Window

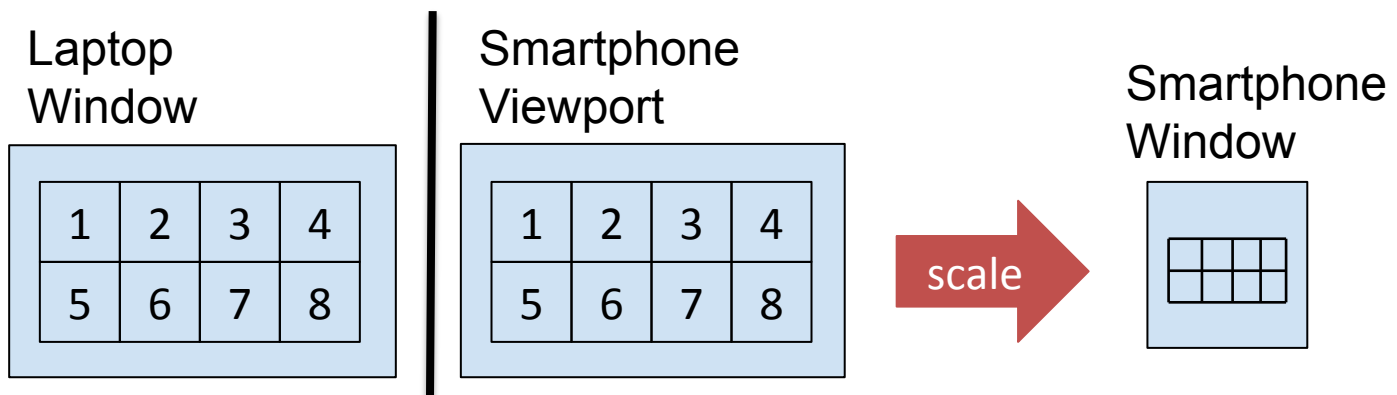
1	2	3	4
5	6	7	8

Smartphone Window

1	2	3	4
5	6	7	8

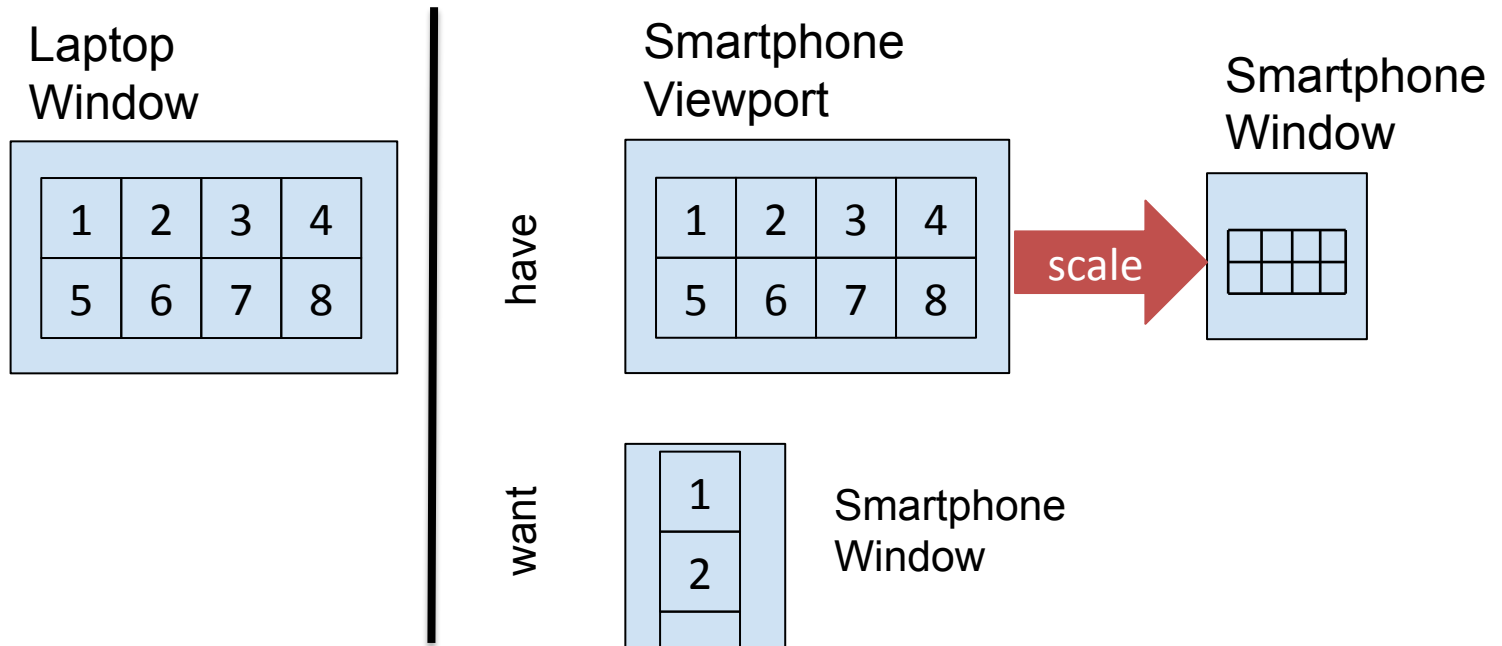
Smartphone Viewport

Original solution: Smartphone *viewport*



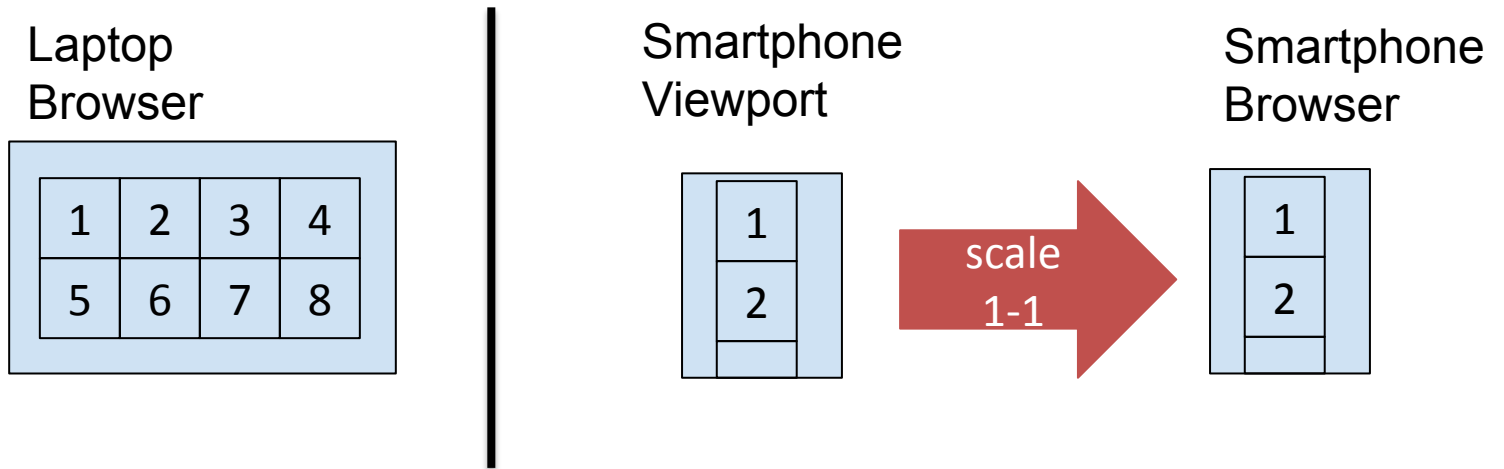
Smartphone Viewport

Current problem: Viewport inappropriate for responsive apps



Smartphone Viewport

Current solution: Bypass viewport concept

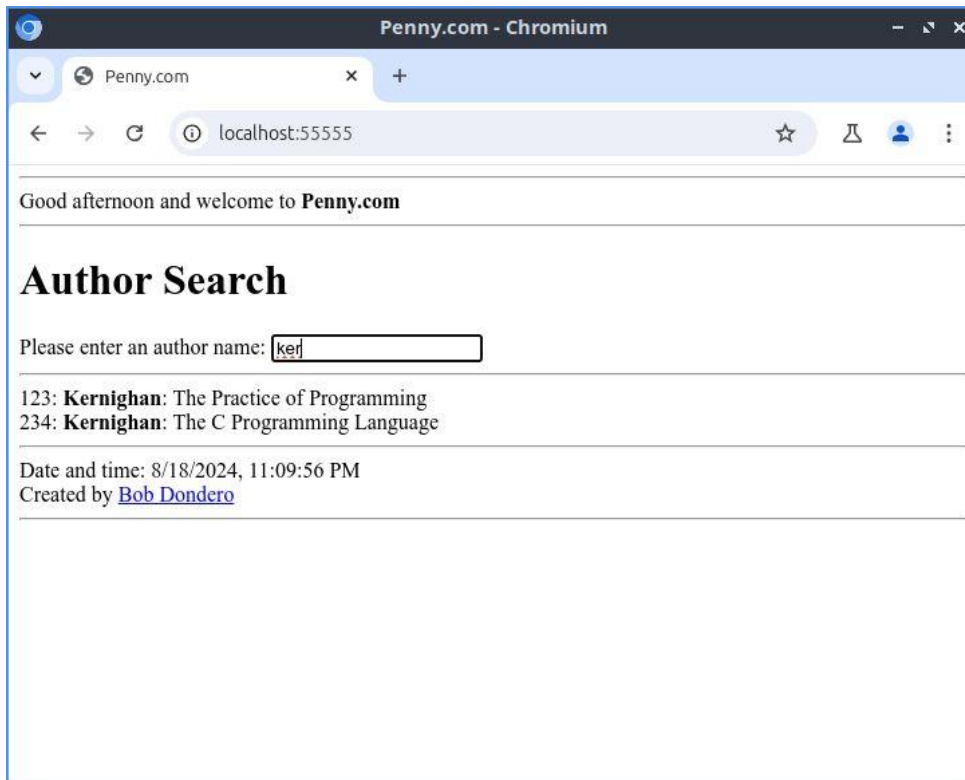


Smartphone Viewport

- See **PennyViewport** app
 - runserver.py
 - penny.sql, penny.sqlite
 - database.py
 - **penny.py** (same as previous)
 - **index.html**

Smartphone Viewport

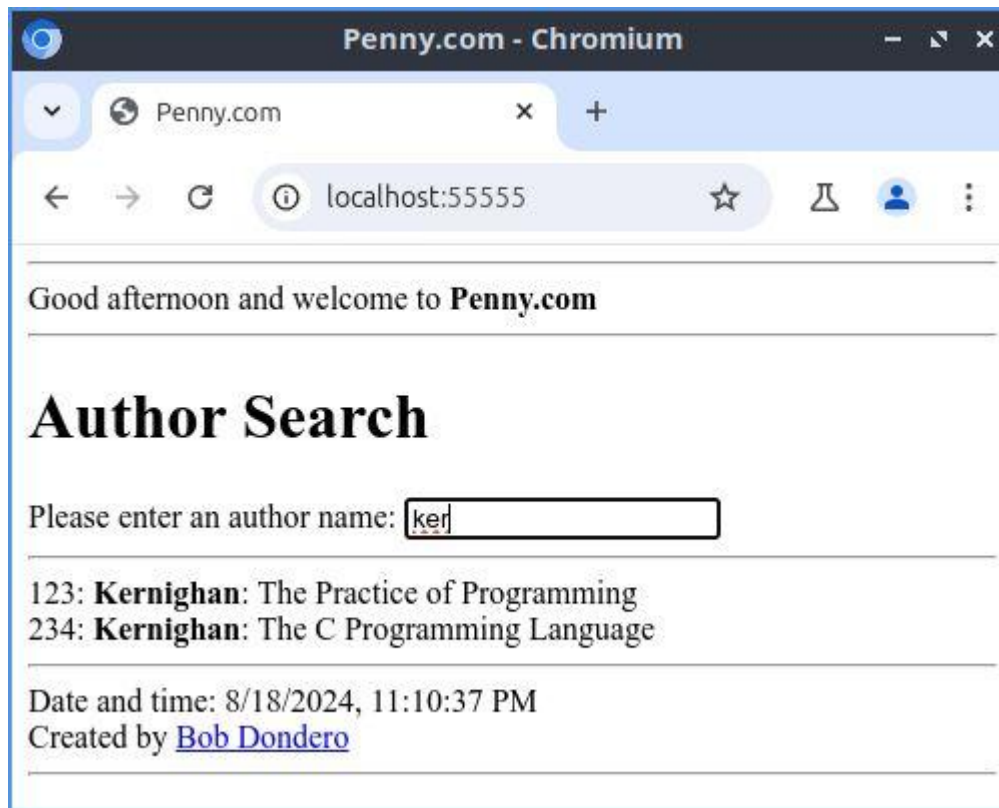
- See **PennyViewport** app (cont.)
 - Laptop computer (large browser window)



OK

Smartphone Viewport

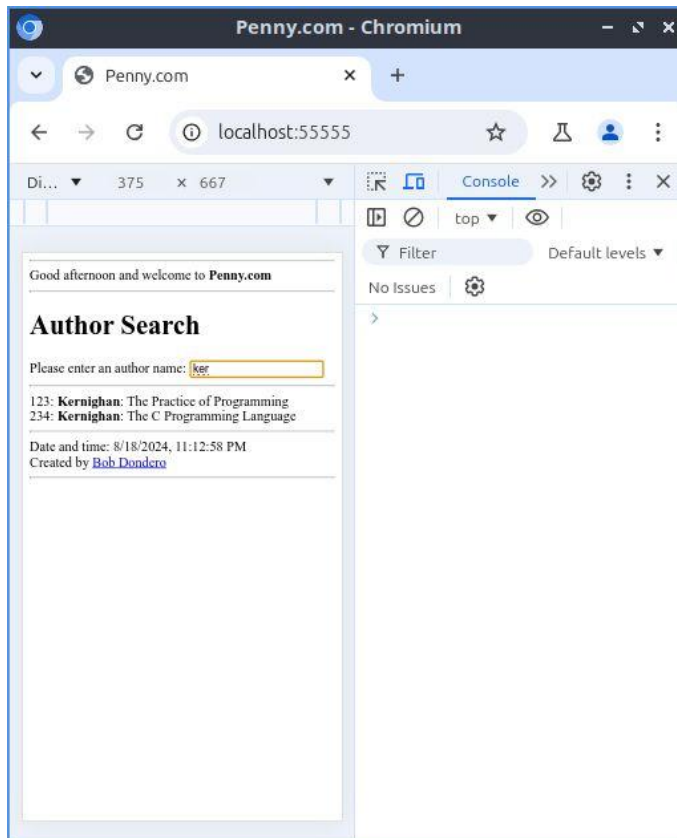
- See **PennyViewport** app (cont.)
 - Laptop computer (small browser window)



OK

Smartphone Viewport

- See **PennyViewport** app (cont.)
 - Smartphone (very small browser window)



Maybe OK?

Agenda

- The smartphone viewport
- **CSS**
- Responsive web apps
- CSS libraries

CSS

- **Problem:** (Prior to CSS)
 - Specification of style info was repetitive & difficult to maintain

somefile.html

```
<html>
  ...
  <body>
    <font color="red"><h1>First Heading</h1></font>
    ...
    <font color="red"><h1>Second Heading</h1></font>
    ...
  </body>
</html>
```

CSS

- **Solution:** Cascading Style Sheets (CSS)
 - W3C standard
 - Defines rules that browser uses to render HTML elements

CSS

- ***External rules***: rules in an external style sheet

mystyle.css

```
h1 {color:red;}
```

somefile.html

```
<html>
  <head>
    <link rel="stylesheet"
          href="mystyle.css">
    ...
  </head>
  <body>
    <h1>First Heading</h1>
    ...
    <h1>Second Heading</h1>
    ...
  </body>
</html>
```

CSS

- ***Embedded rules***: rules in an embedded style sheet

somefile.html

```
<html>
  <head>
    <style>
      h1 {color:red;}
    </style>
    ...
  </head>
  <body>
    <h1>First Heading</h1>
    ...
    <h1>Second Heading</h1>
    ...
  </body>
</html>
```

CSS

- *Inline rules*

somefile.html

```
<html>
  <body>
    <h1 style="color:red;">
      First Heading
    </h1>
    ...
    <h1 style="color:red;">
      Second Heading
    </h1>
    ...
  </body>
</html>
```

CSS

- The browser “cascade”
 - To style a HTML document, browser applies rules in this order...

CSS

Rules created by the browser authors
Rules created by the browser user
Rules created by the document authors
 External rules
 Embedded rules
 Inline rules

Rules created by the document author
 Rules with element selectors
 Rules with class selectors
 Rules with ID or attribute selectors

CSS

- CSS rule syntax:

```
selector  
{  
    property: value;  
    property: value;  
    ...  
}
```


CSS

selector

{

property: value;

property: value;

...

}

CSS

From https://www.w3schools.com/cssref/css_selectors.asp

Selector	Example	Example Description
<code>.class</code>	<code>.xxx</code>	Select all elements with a <code>class</code> attribute whose value is <code>xxx</code>
<code>#id</code>	<code>#xxx</code>	Select the element with an <code>id</code> attribute whose value is <code>xxx</code>
<code>*</code>	<code>*</code>	Select all elements
<code>element</code>	<code>p</code>	Select all <code><p></code> elements
<code>element, element</code>	<code>div, p</code>	Select all <code><div></code> elements and all <code><p></code> elements
<code>element element</code>	<code>div p</code>	Select all <code><p></code> elements inside <code><div></code> elements
<code>element>element</code>	<code>div > p</code>	Select all <code><p></code> elements where the parent is a <code><div></code> element

CSS

From https://www.w3schools.com/cssref/css_selectors.asp

Selector	Example	Example Description
<code>[attribute]</code>	<code>[type]</code>	Select all elements with a <code>type</code> attribute
<code>[attribute=value]</code>	<code>[type=text]</code>	Select all elements with a <code>type</code> attribute whose value is <code>text</code>

And **many** more (58 of them)

CSS

```
selector  
{  
    property: value;  
    property: value;  
    ...  
}
```

CSS

From <https://www.w3schools.com/cssref/default.asp>

Property	Example	Example Description
<code>font-family</code>	<code>font-family:Arial</code>	Set the font family of text within the selected element(s) to Arial
<code>font-size</code>	<code>font-size:20px</code>	Set the font size of text within the selected element(s) to 20 pixels
<code>color</code>	<code>color:white</code>	Set the color of text within the selected element(s) to white
<code>background-color</code>	<code>background-color:#295078</code>	Set the background color of the selected element(s) to r:29, g:50, b:78
<code>text-align</code>	<code>text-align:center</code>	Set the horizontal alignment of text within the selected element(s) to center
<code>border-style</code>	<code>border-style:solid</code>	Set the style of the four borders of the selected element(s) to solid
<code>border-color</code>	<code>border-color:gray</code>	Set the color of the four borders of the selected element(s) to gray
<code>border-width</code>	<code>border-width:1px</code>	Set the width of the four borders of the selected element(s) to 1 pixel

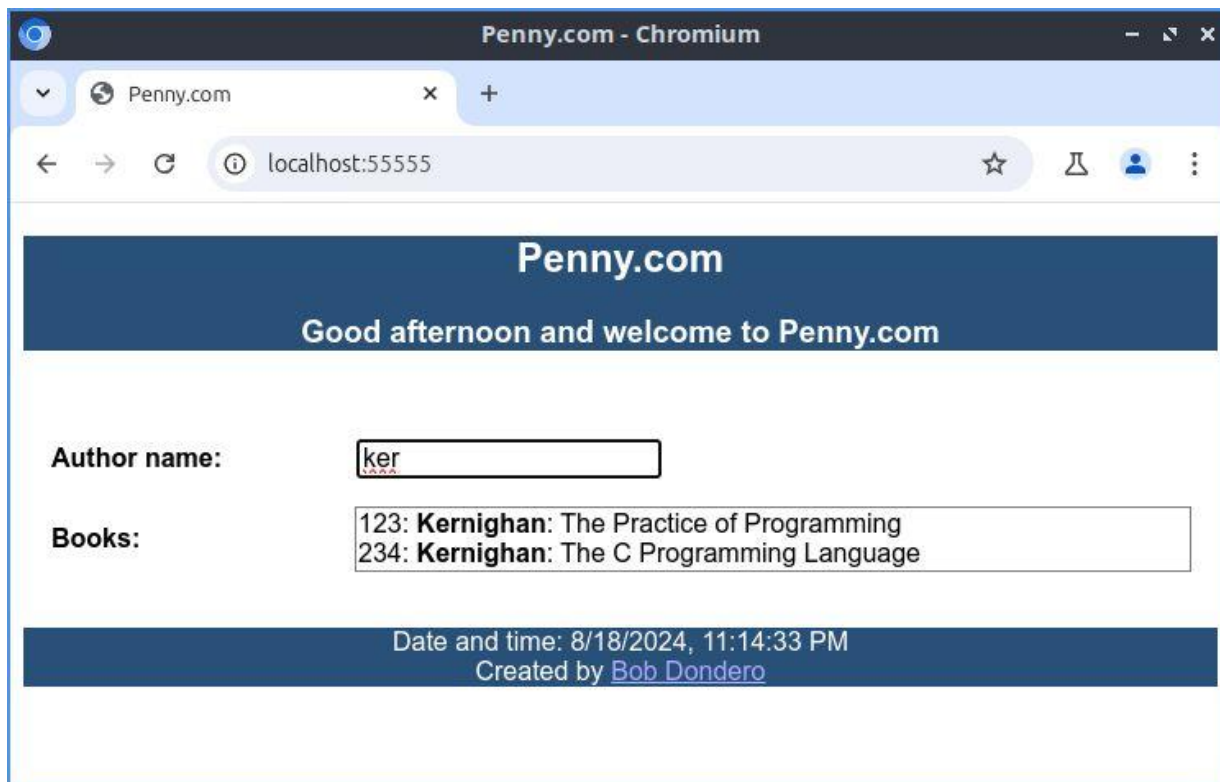
And **many** more (over 200 of them)

CSS

- See **PennyCss** app
 - runserver.py
 - penny.sql, penny.sqlite
 - database.py
 - penny.py
 - **static/penny.css**
 - **index.html**

CSS

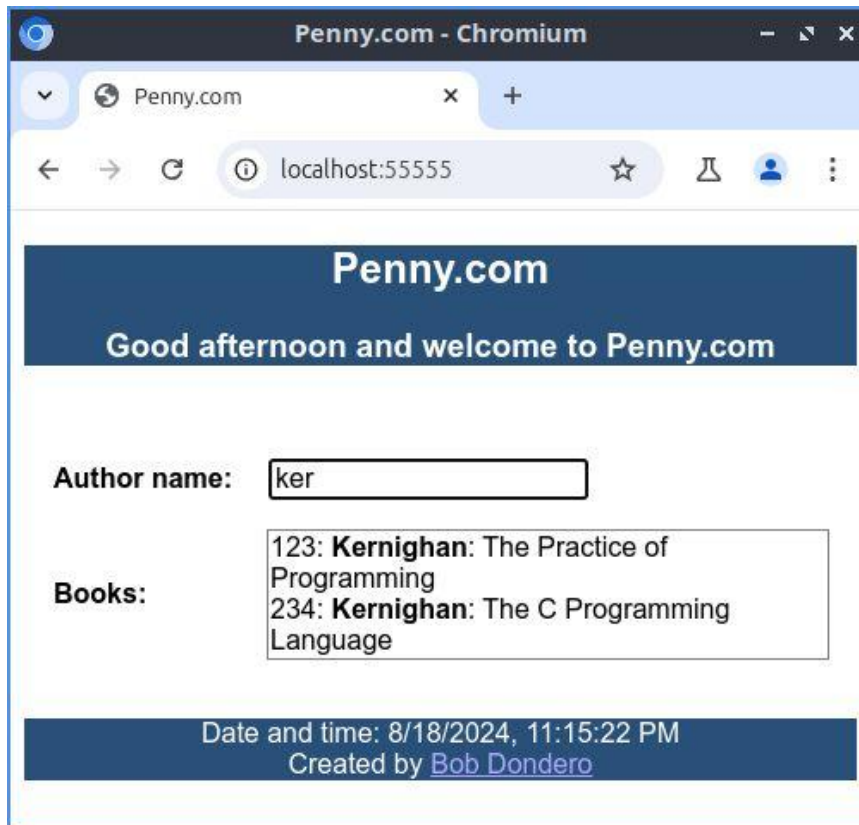
- See **PennyCss** app (cont.)
 - Laptop computer (large browser window)



Good

CSS

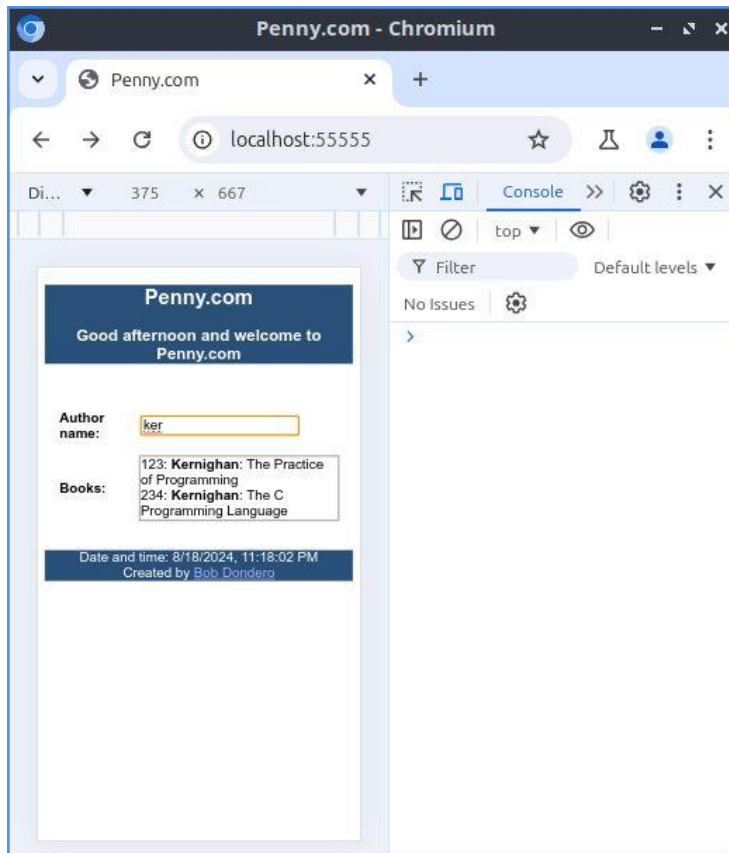
- See **PennyCss** app (cont.)
 - Laptop computer (small browser window)



OK

CSS

- See **PennyCss** app (cont.)
 - Smartphone (very small browser window)



Maybe
OK

Agenda

- The smartphone viewport
- CSS
- **Responsive web apps**
- CSS libraries

Responsive Apps

- **Problem:**
 - Web apps should adjust themselves based upon browser characteristics
- **Solution:**
 - Responsive web apps

Responsive Apps

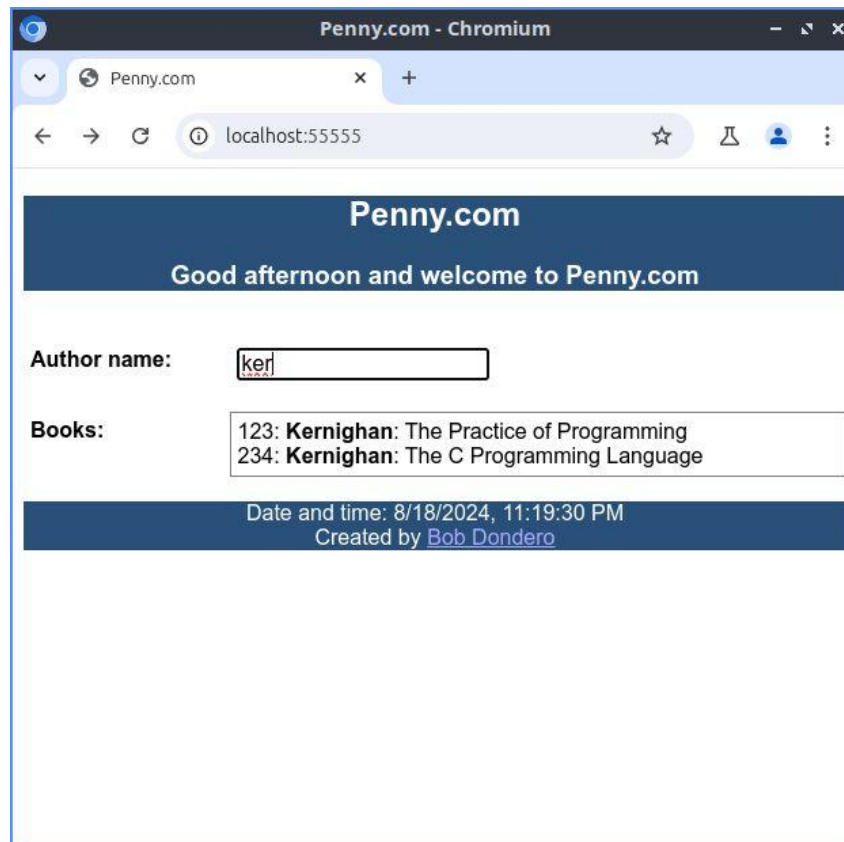
- Responsive web app
 - Rearranges tables
 - Large window => multiple columns
 - Small window => fewer columns
 - Collapses menus
 - Large window => ordinary menu
 - Small window => drop-down menu
 - Hides some content
 - Large window => display all content
 - Small window => hide some content
 - Etc.

Responsive Apps

- See **PennyResponsive** app (cont.)
 - runserver.py
 - penny.sql, penny.sqlite
 - database.py
 - penny.py
 - **static/penny.css**
 - **index.html**

Responsive Apps

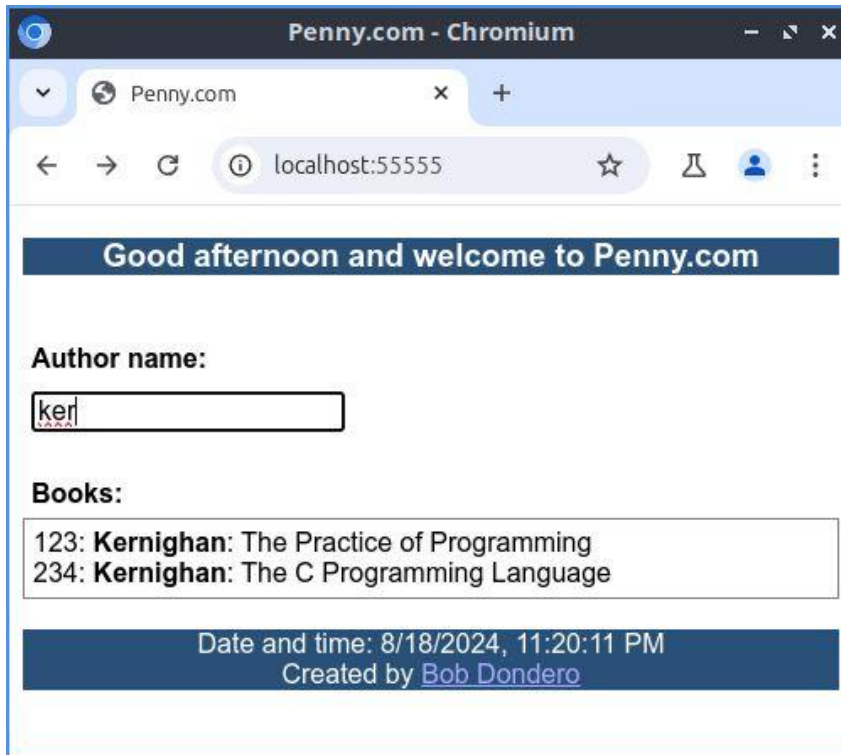
- See **PennyResponsive** app (cont.)
 - Laptop computer (large browser window)



Good

Responsive Apps

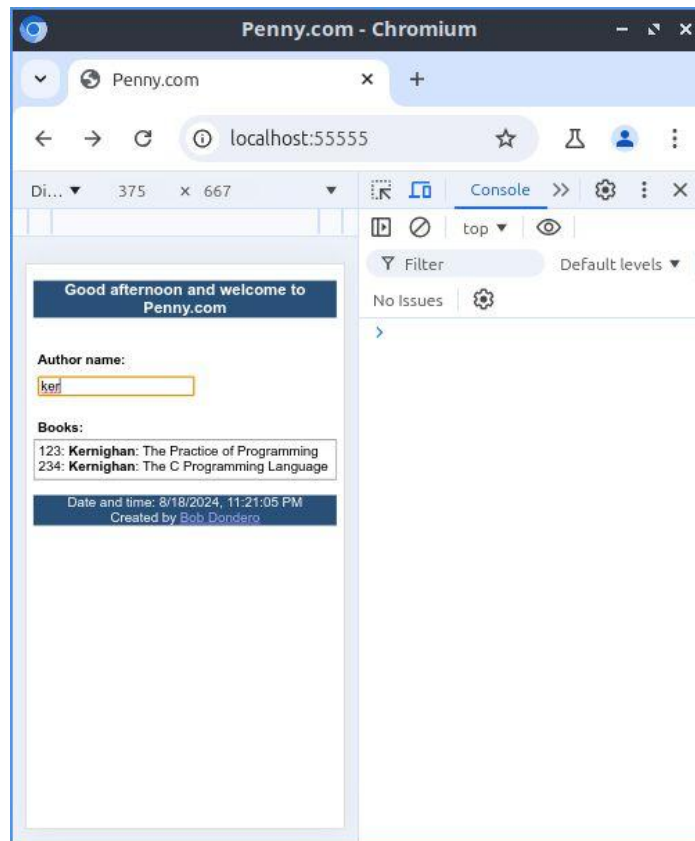
- See **PennyResponsive** app (cont.)
 - Laptop computer (small browser window)



Good!

Responsive Apps

- See **PennyResponsive** app (cont.)
 - Smartphone (very small browser window)



Good!!!

Agenda

- The smartphone viewport
- CSS
- Responsive web apps
- **CSS libraries**

CSS Libraries

- **Problem:**
 - Composing CSS rules is tedious
 - CSS patterns (e.g., grid system) are common
 - Redundancy across apps

CSS Libraries

- **Solution:** *CSS libraries*
 - Define CSS rules
 - Examples:
 - **Bootstrap**, Foundation, YAML, Blueprint, **W3.CSS**, ...

CSS Libraries

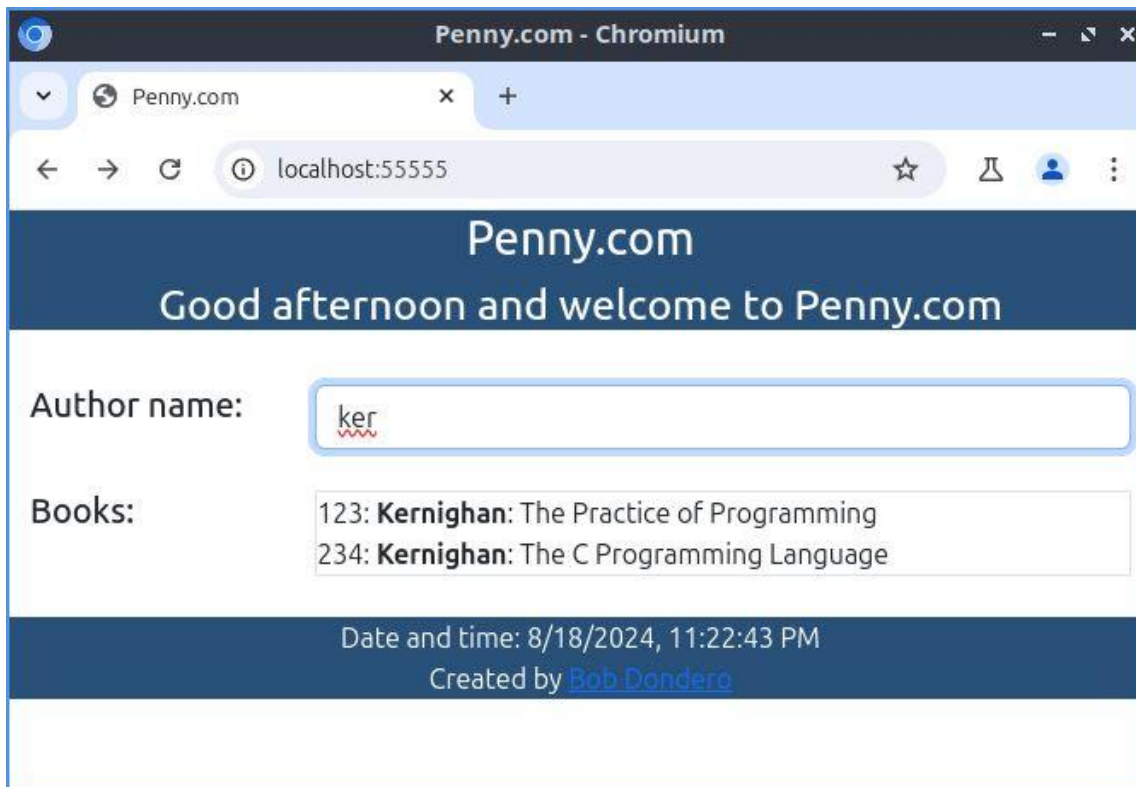
- ***Bootstrap***
 - From X (Twitter)
 - The most popular CSS framework
- ***W3.CSS***
 - From W3Schools
 - Not popular, but simple & pleasant

CSS Libraries: Example

- See **PennyBootstrap** app
 - runserver.py
 - penny.sql, penny.sqlite
 - database.py
 - penny.py
 - ~~- static/penny.css~~
 - **index.html**

CSS Libraries: Example

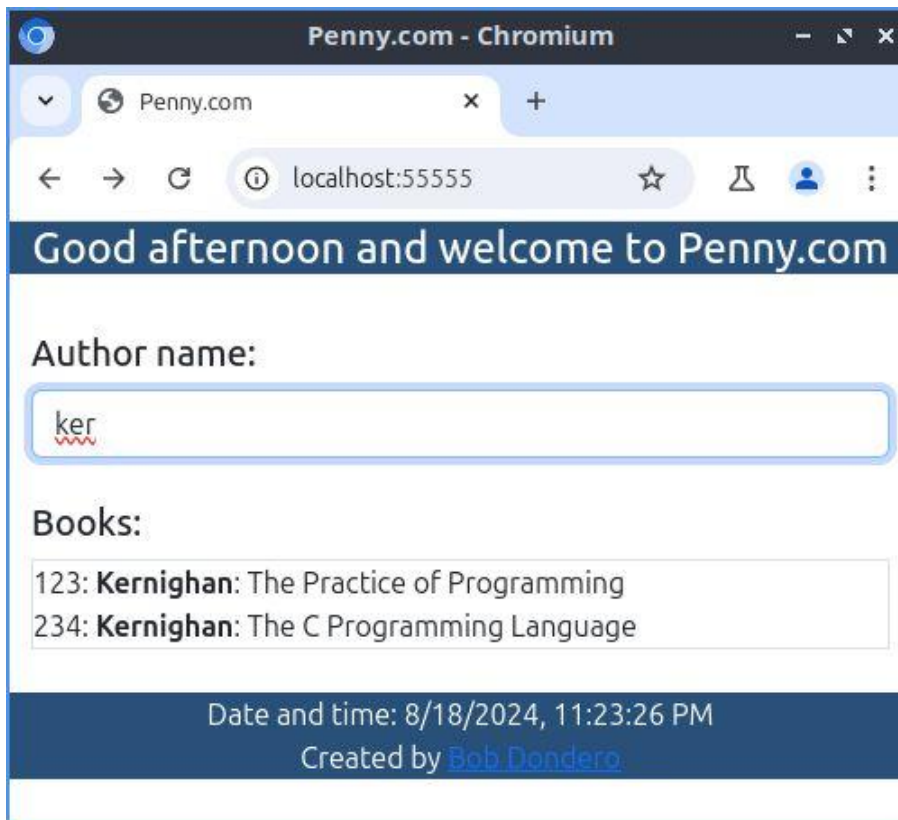
- See **PennyBootstrap** app (cont.)
 - Laptop computer (large browser window)



Good

CSS Libraries: Example

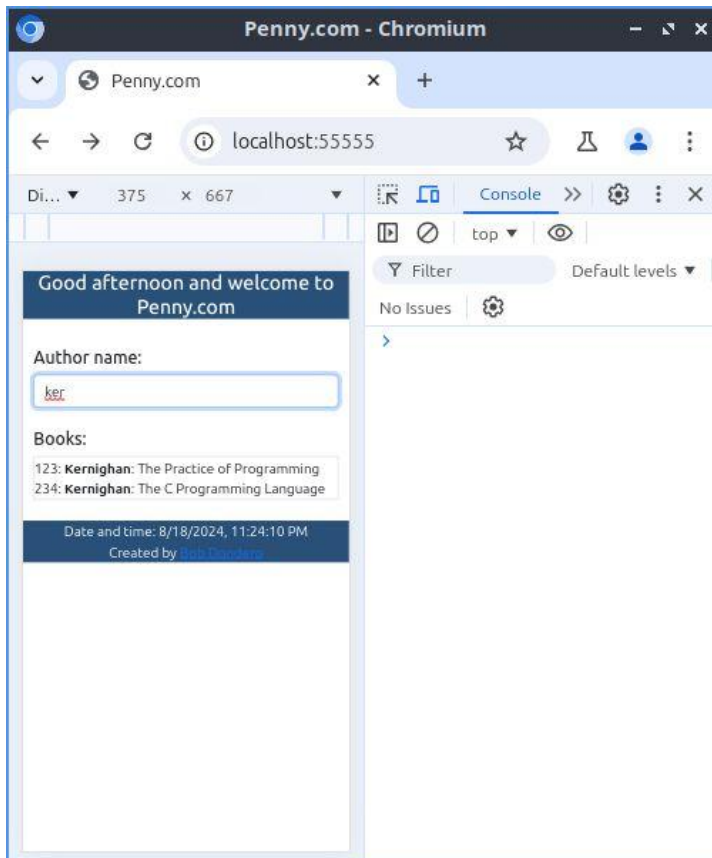
- See **PennyBootstrap** app (cont.)
 - Laptop computer (small browser window)



Good!

CSS Libraries: Example

- See **PennyBootstrap** app (cont.)
 - Smartphone (very small browser window)



Good!!!

Aside: Bootstrap Modals

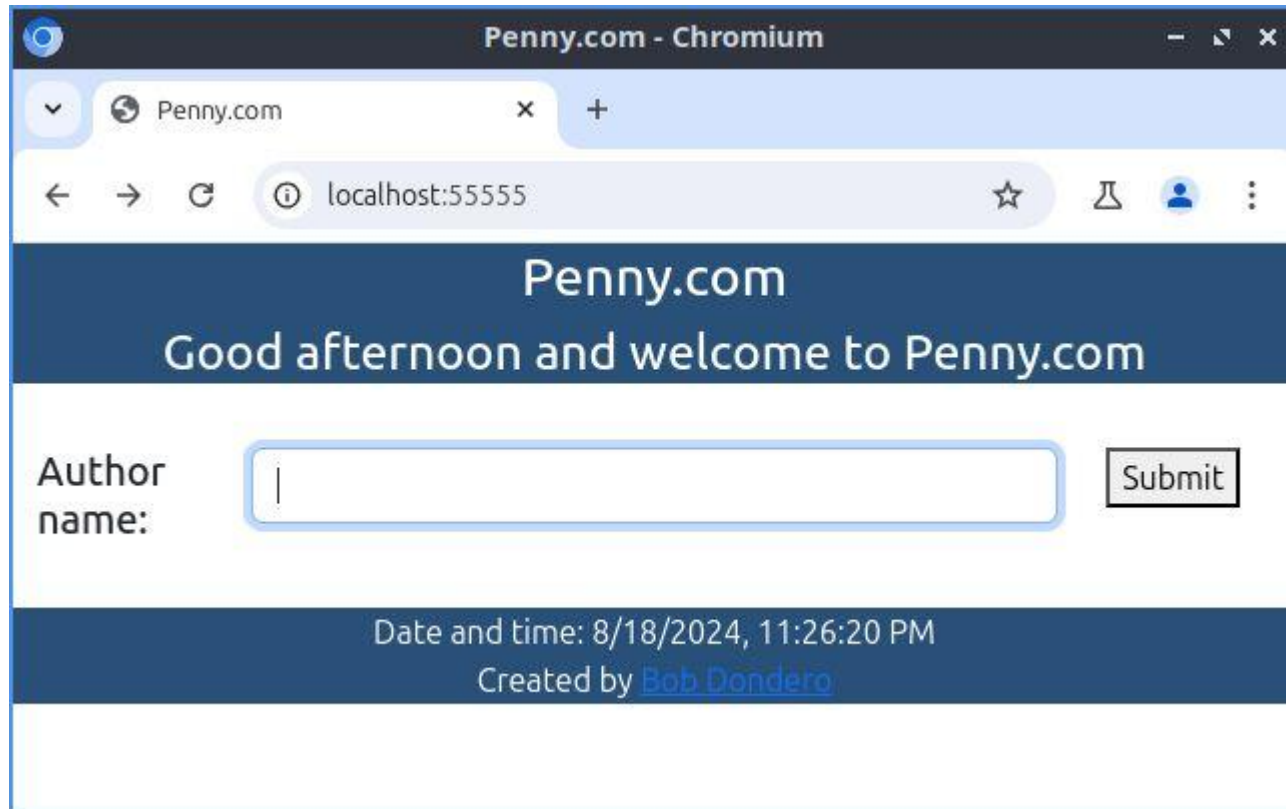
- **Aside:** *modal*
 - Alias *modal window*
 - Alias *modal dialog*
 - Alias *modal dialog box*
 - A window that:
 - Is subordinate to the main window
 - Typically occludes (part of) the main window
 - Disables user interaction with the main window until dismissed

Aside: Bootstrap Modals

- **Aside:** modals in Bootstrap
 - An inferior but potentially useful version of Penny...

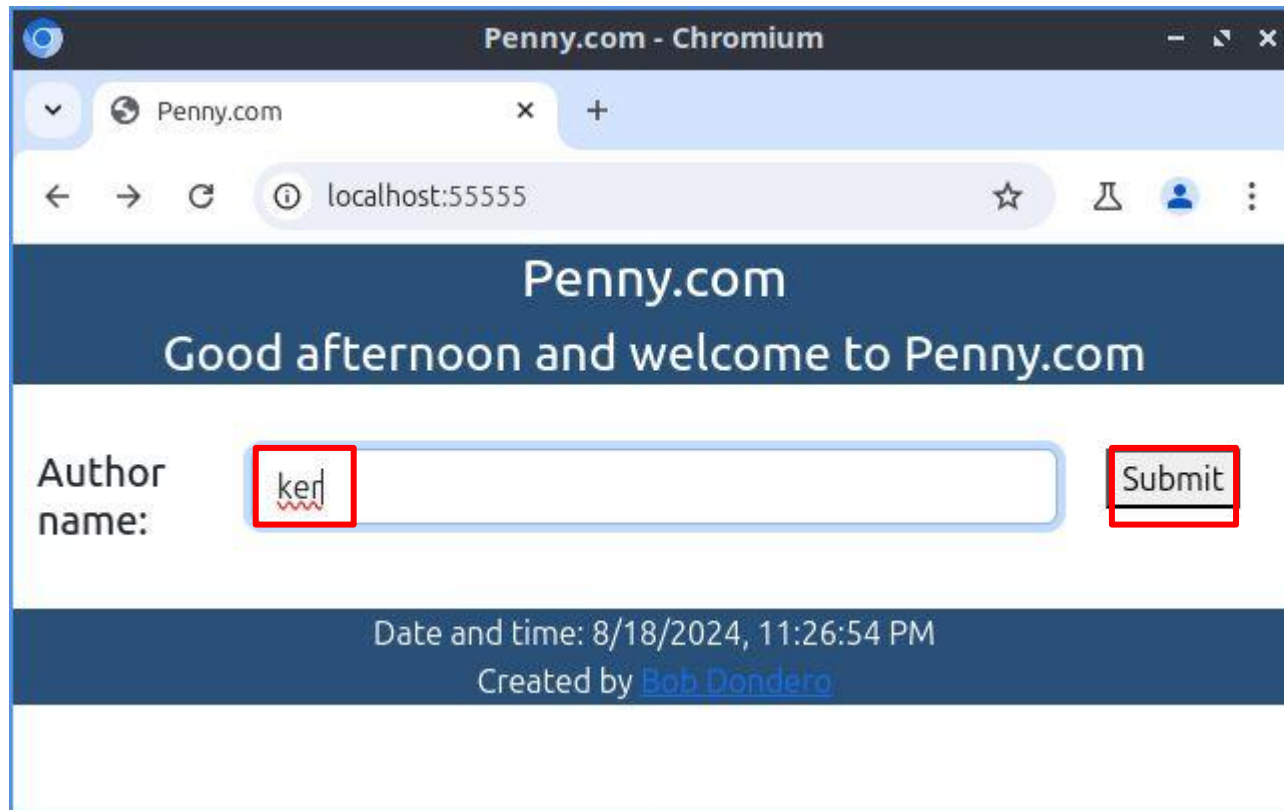
Aside: Bootstrap Modals

- See **PennyModal** app



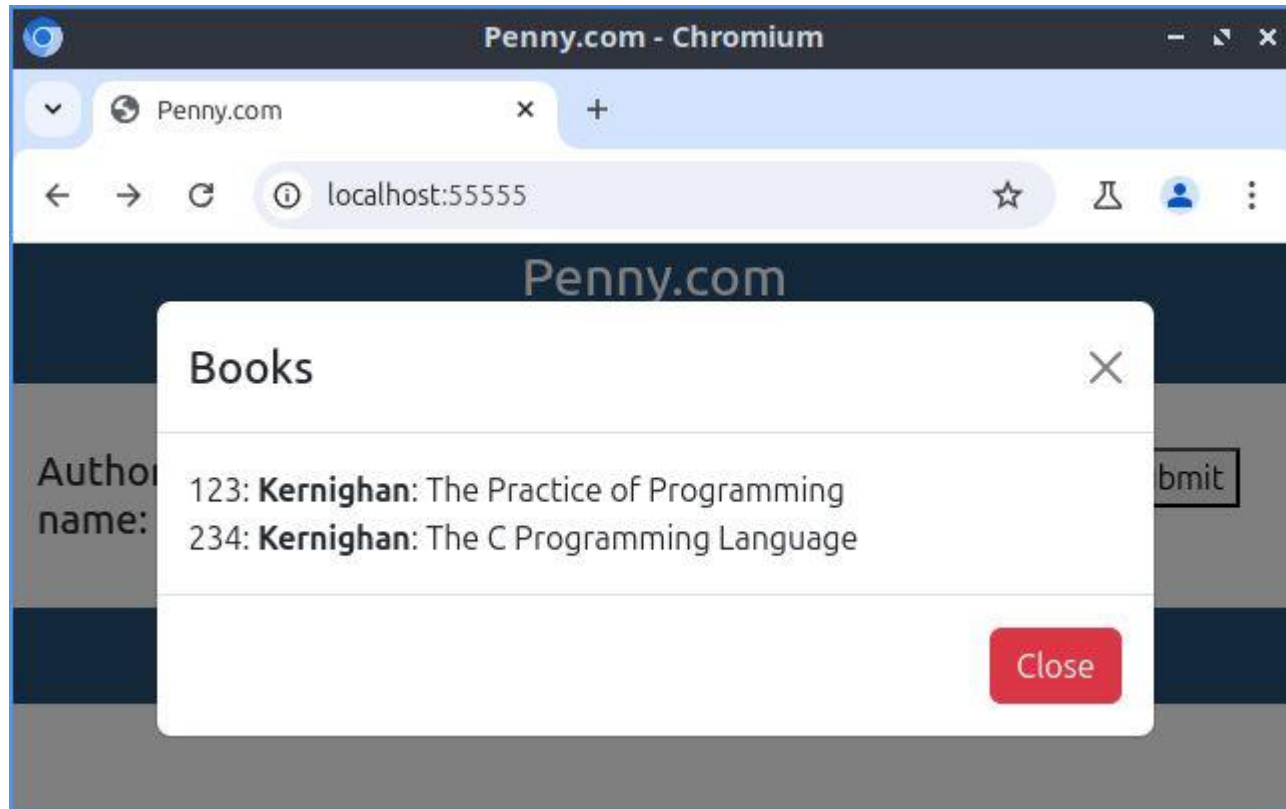
Aside: Bootstrap Modals

- See **PennyModal** app (cont.)



Aside: Bootstrap Modals

- See **PennyModal** app (cont.)



Aside: Bootstrap Modals

- See **PennyModal** app (cont.)
 - runserver.py
 - penny.sql, penny.sqlite
 - database.py
 - penny.py
 - **index.html**
 - Choose indexRaw.html, indexjQuery.html, or indexReact.html

Aside: Bootstrap Modals

- See **PennyModal** app (cont.)
 - **indexRaw.html**
 - Uses Bootstrap CSS + Bootstrap JavaScript
 - **indexjQuery.html**
 - Uses Bootstrap CSS + Bootstrap JavaScript + jQuery
 - **indexReact.html**
 - Uses Bootstrap CSS + *React-Bootstrap JavaScript* + React

More Information

- To learn more about **CSS**
 - <https://www.w3schools.com/css/>
 - Robin Nixon, *Learning PHP, MySQL & JavaScript (with jQuery, CSS, & HTML5)*
- To learn more about **Bootstrap**
 - <https://www.w3schools.com/bootstrap5/>
- To learn more about **React-Bootstrap**
 - <https://react-bootstrap.netlify.app/>

Summary

- We have covered:
 - The smartphone viewport
 - Cascading style sheets (CSS)
 - Responsive web apps
 - CSS libraries
 - Bootstrap