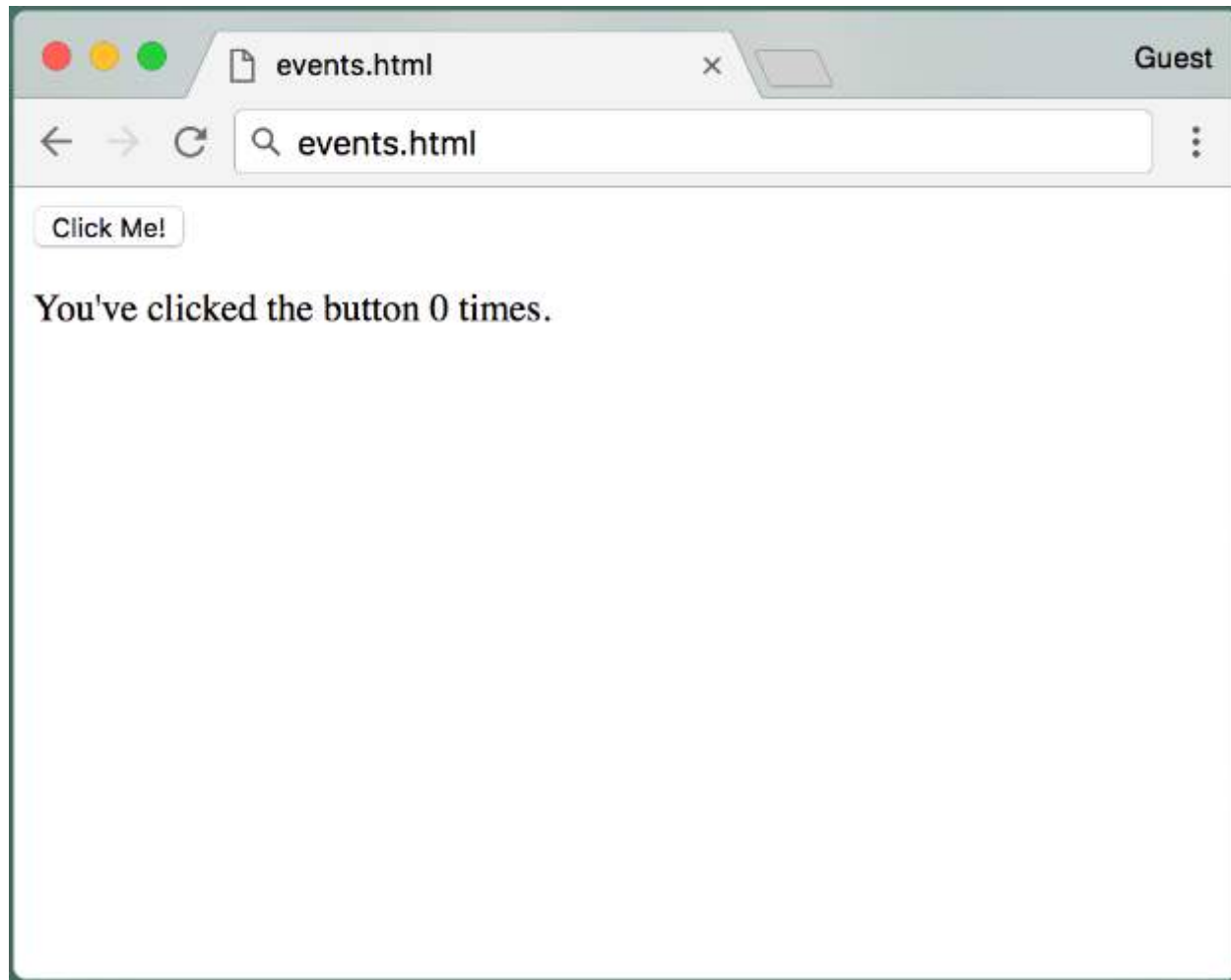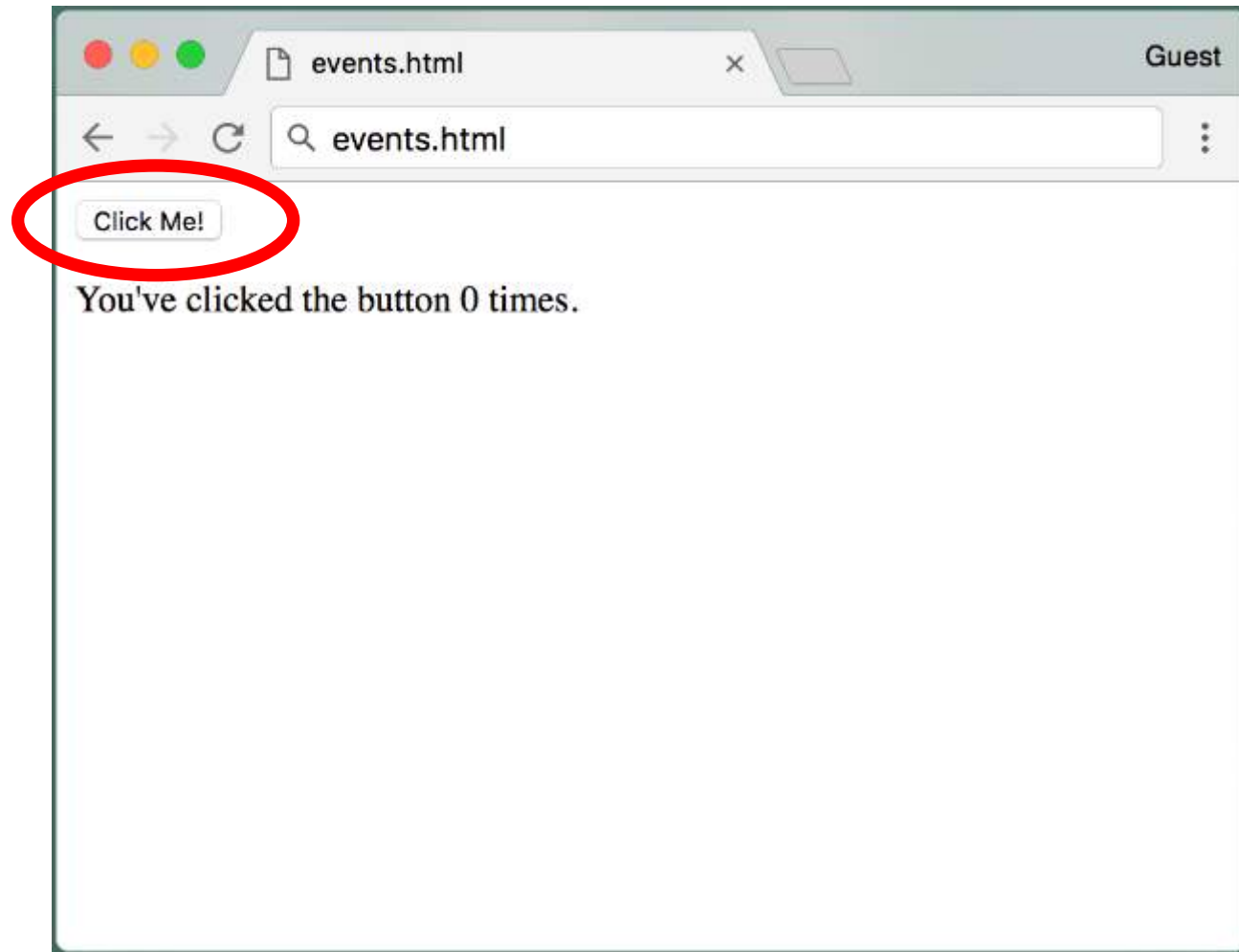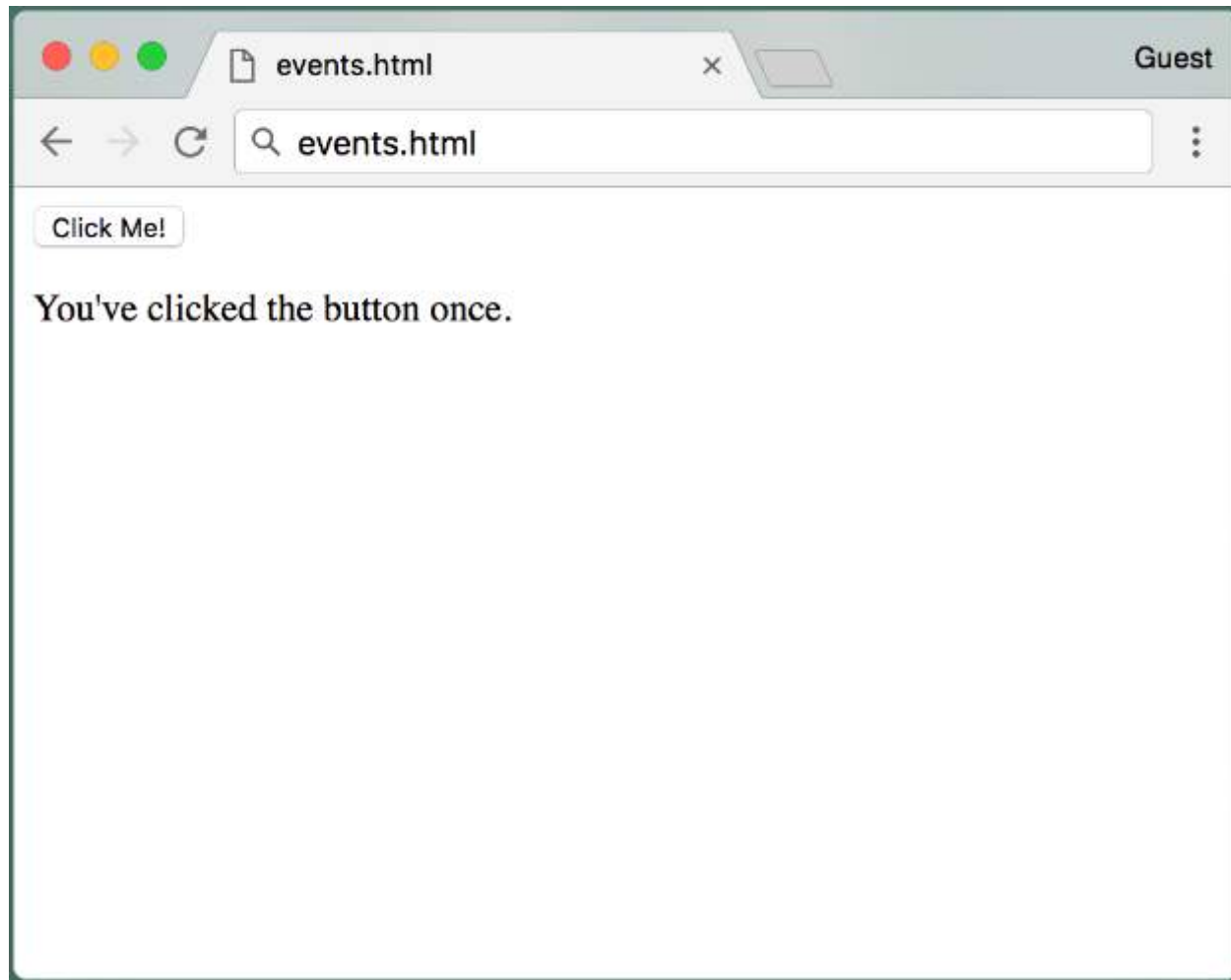# Video 2.8
Chris Murphy

SD4x-2

Review: HTML, JavaScript, DOM
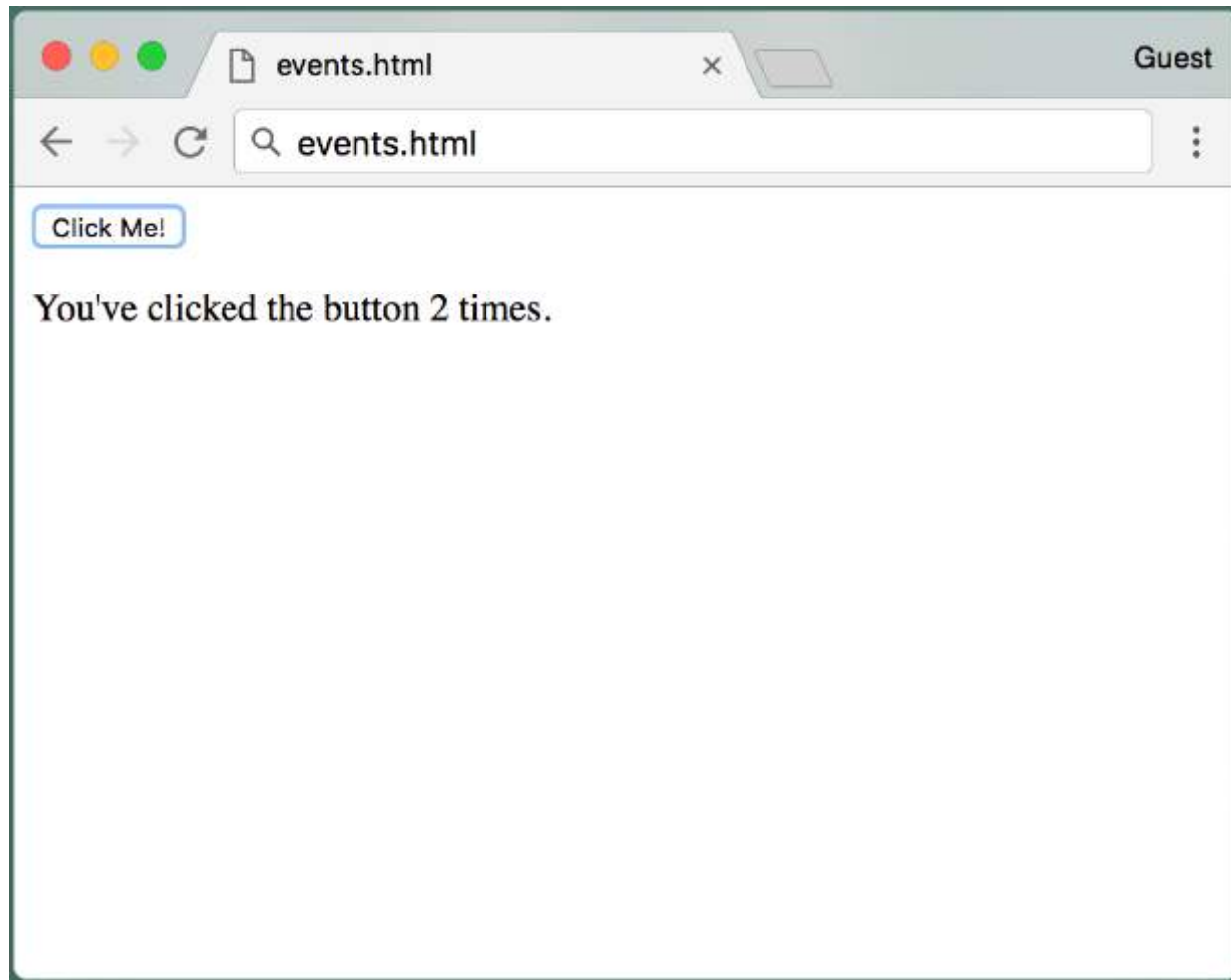
- Previously we saw that JavaScript can use the DOM to retrieve/modify HTML elements

  - `document.getElementById('id')` returns the specific HTML element with that ID

  - `element.innerHTML` can be modified to change the element's HTML/content

  - `element.style` can be modified to change the element's CSS/appearance

- How can we do this in response to user events?

```html
<html>
<body>

<button id="clickMe">Click Me!</button>
<p>
You've clicked the button <span id="numClicks">0 times</span>.

<script>
var clicks = 0;

function clickHandler() {
  clicks++;
  var numClicksSpan = document.getElementById('numClicks');
  if (clicks == 1)
    numClicksSpan.innerHTML = 'once';
  else
    numClicksSpan.innerHTML = clicks + ' times';
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var button = document.getElementById('clickMe');
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Penn
Engineering

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Event-Driven Programming

- Ordinarily we think of a program as a sequence of instructions and function calls

- **Event-Driven programming** is when a program's behavior is based on *events*

- In web programming, these events are generally user actions

- Different events/actions invoke different **callback functions** which handle that event/action

Event-Driven Programming

- Event-Driven programming is a form of asynchronous programming

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- Event-Driven programming is a form of asynchronous programming

  - Synchronous Way:

    - You are expecting a user input

    - You continuously re-check a text field until the user has put in the required information

    - You run some code on the user input
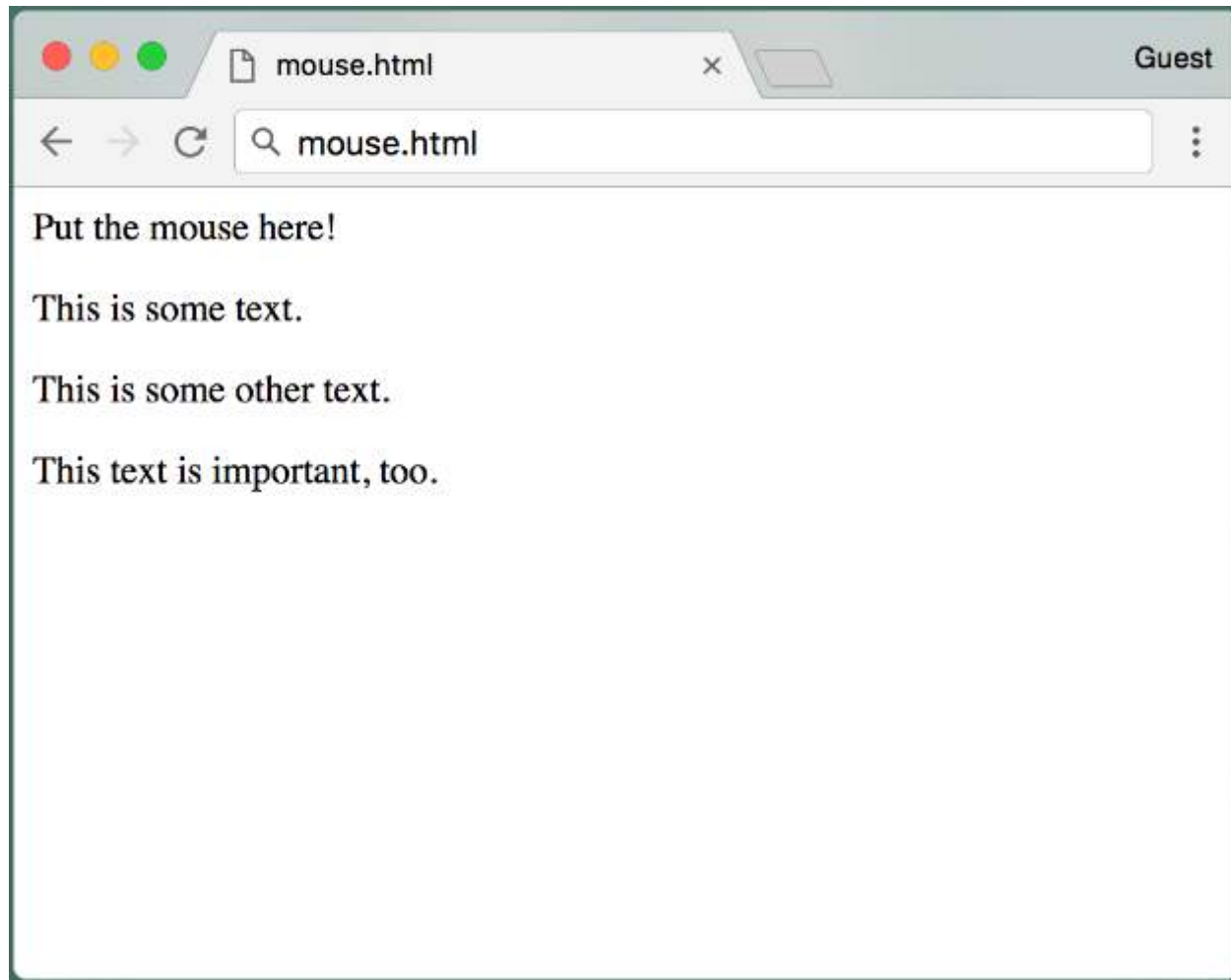
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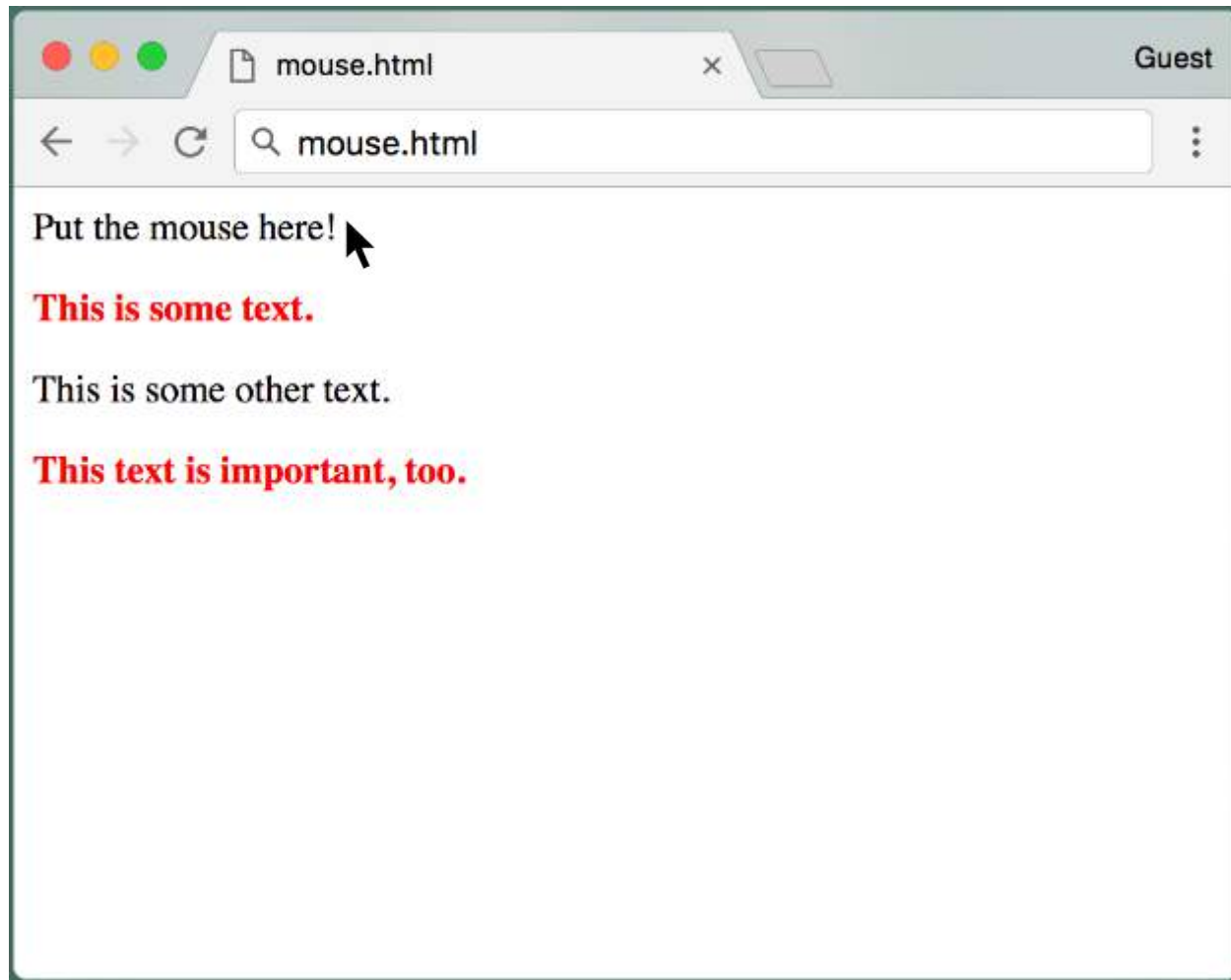   - You run some code on the user input

  - Event-Driven/Asynchronous Way:

    - You are expecting a user input

    - You tell your browser to let your program know when the user has put in the required information

    - You (possibly) run other code until your browser notifies you

    - When the user has entered the information, you run the associated callback function

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<div id="mouseOverMe"> Put the mouse here! </div> <p>
<div class="highlightText"> This is some text. </div> <p>
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<div class="highlightText"> This text is important, too.</div>

<script>
 function makeBold() {
   var divs = document.getElementsByClassName('highlightText');
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   var divs = document.getElementsByClassName('highlightText');
   for (var i = 0; i < divs.length; i++) {
       divs[i].style.color = 'black';
       divs[i].style.fontWeight = 'normal';
   }
 }

 var mouseOverMeDiv = document.getElementById('mouseOverMe');
 mouseOverMeDiv.addEventListener('mouseover', makeBold);
 mouseOverMeDiv.addEventListener('mouseout', restore);
</script>
```

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```html
<div id="mouseOverMe"> Put the mouse here! </div> <p>
<div class="highlightText"> This is some text. </div> <p>
<div> This is some other text. </div> <p>
<div class="highlightText"> This text is important, too.</div>

<script>
 function makeBold() {
   var divs = document.getElementsByClassName('highlightText');
   for (var i = 0; i < divs.length; i++) {
       divs[i].style.color = 'red';
       divs[i].style.fontWeight = 'bold';
   }
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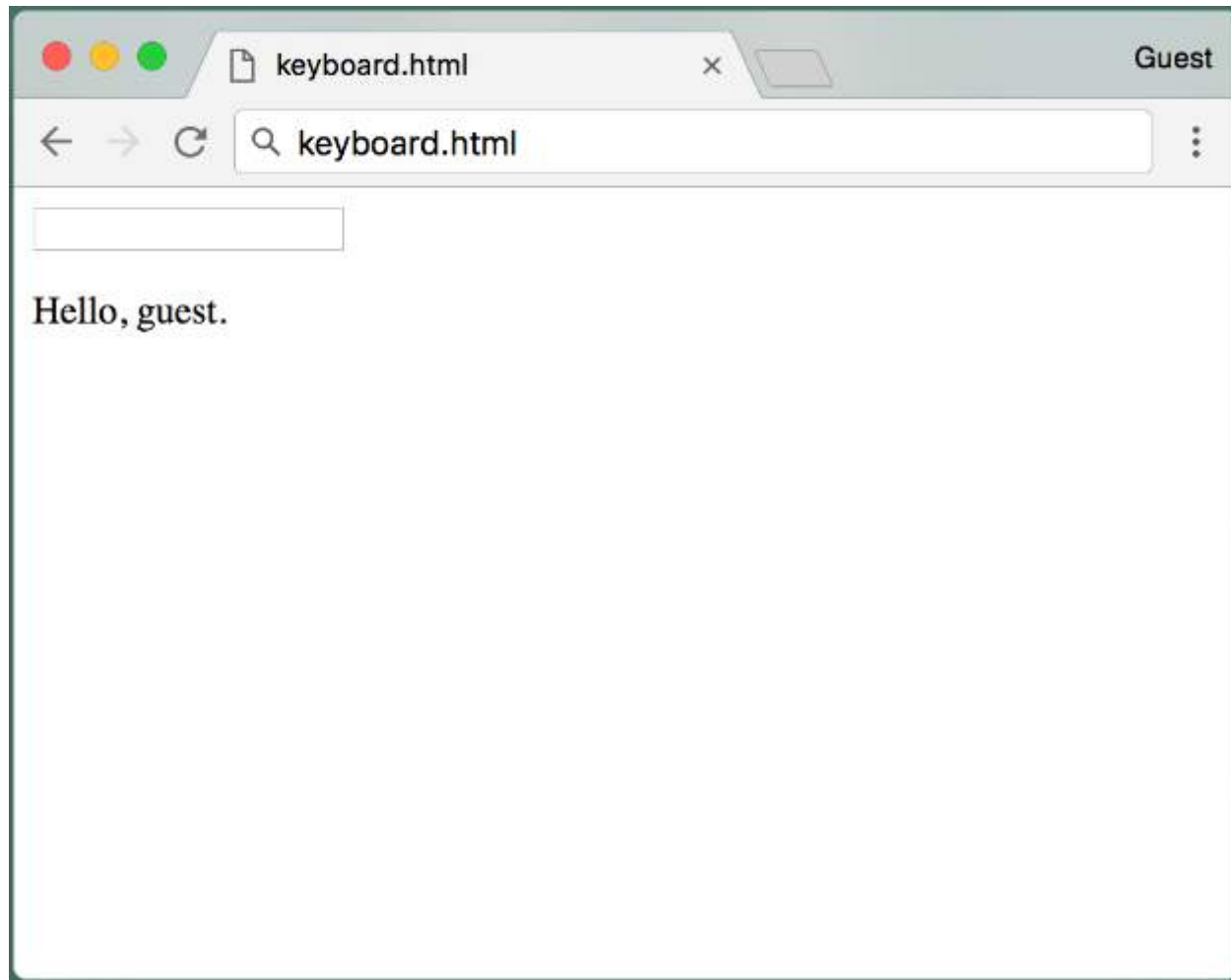
Penn Engineering

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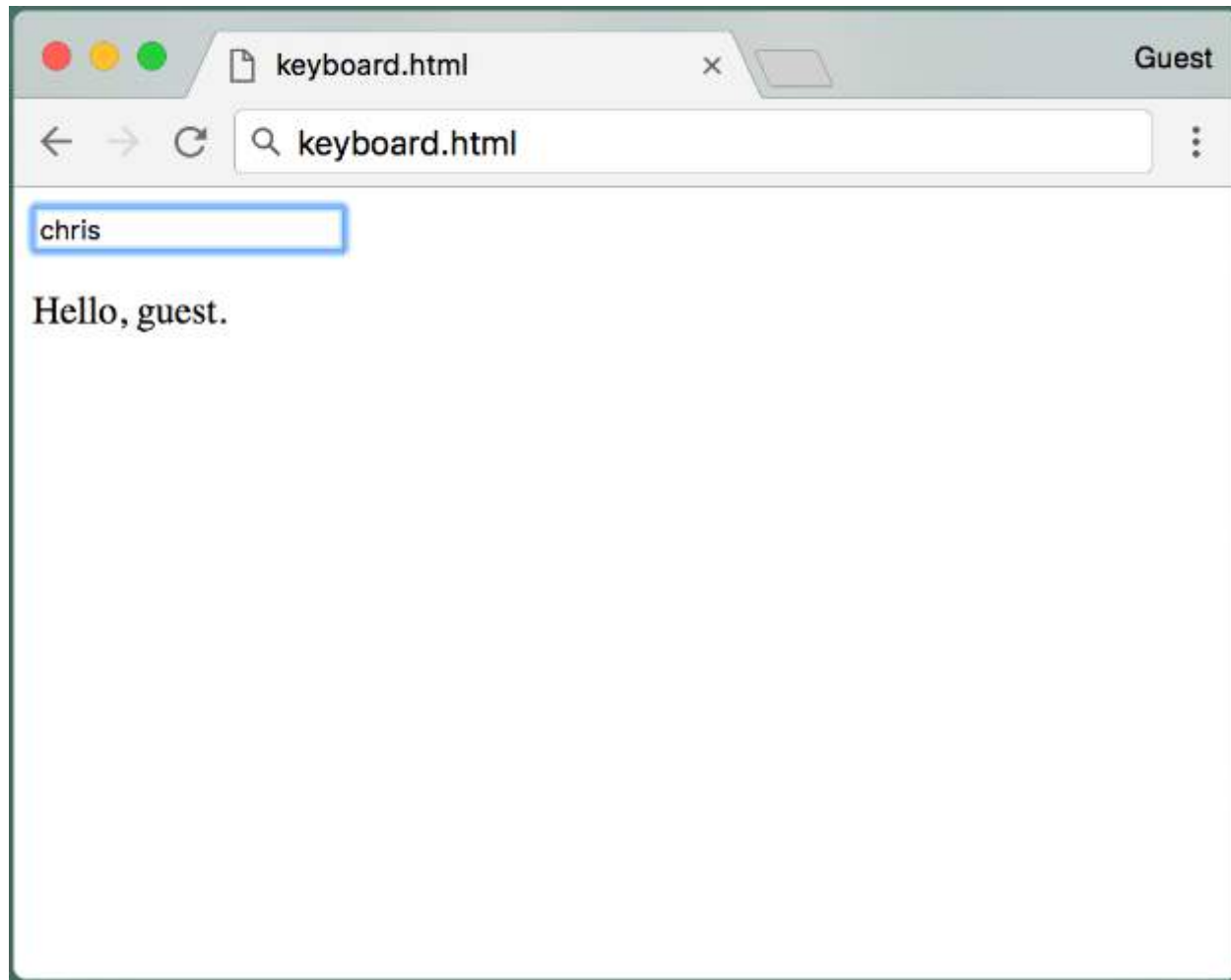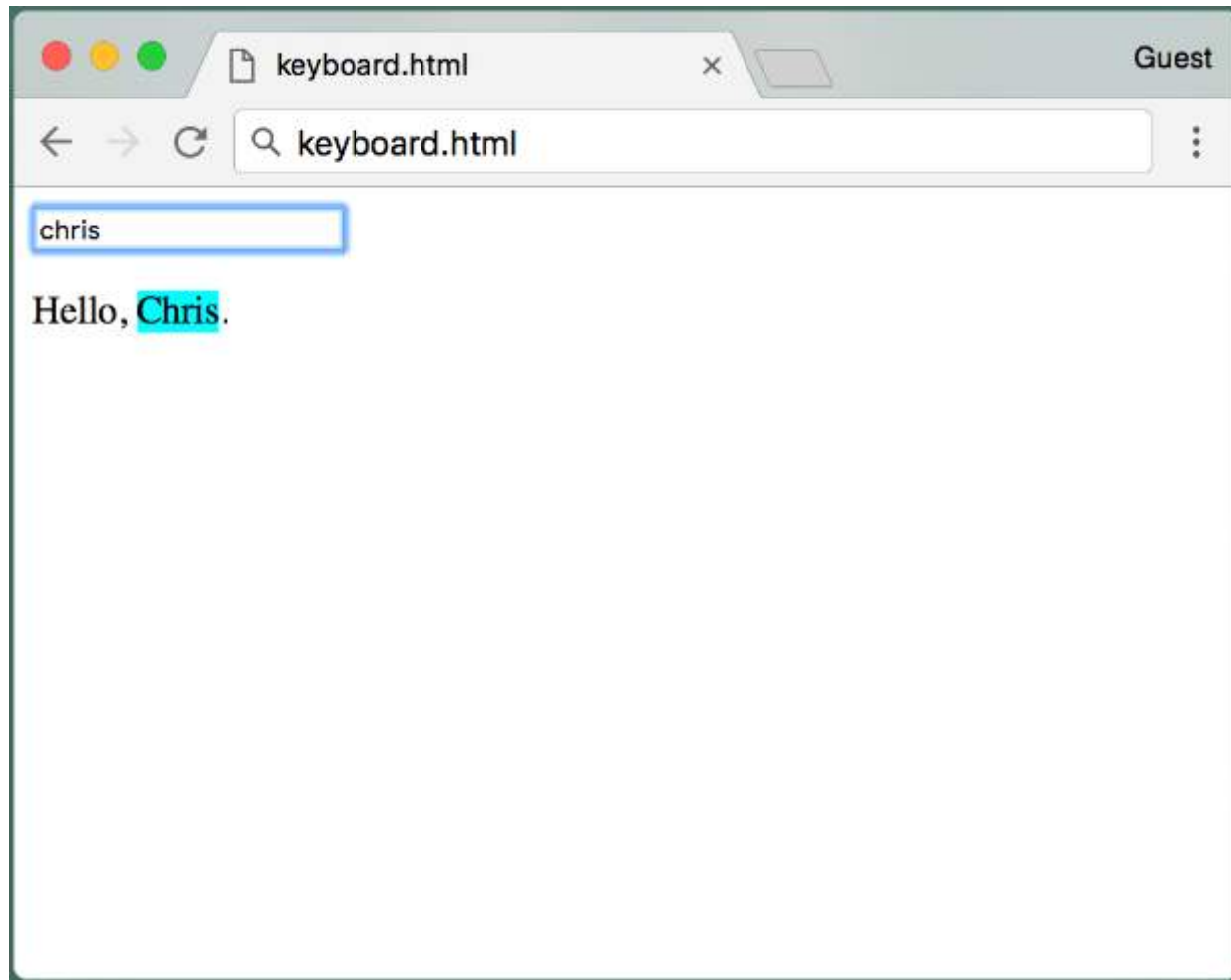
Penn Engineering

```
<html>
<body>

<input id="nameInput"></input>
<p>
Hello, <span id="nameField">guest</span>.

<script>

function nameHandler(e) {
  if (e.keyCode == 13) {
    var nameInput = document.getElementById('nameInput');
    var nameField = document.getElementById('nameField');
    nameField.innerHTML = nameInput.value;
    nameField.style.backgroundColor = 'cyan';
    nameField.style.textTransform = 'capitalize';
  }
}

document.addEventListener('keyup', nameHandler);

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Summary

- We can use **event-driven programming** in JavaScript to modify HTML based on user activity

- We do this by defining **callback functions** and associating them with various events by adding event listeners

  - *element*.addEventListener(*event*, *function*)

  - Events: 'click', 'mouseover', 'mouseout', 'keyup'

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