



DOM Events

SENG 4640

Software Engineering for Web Apps

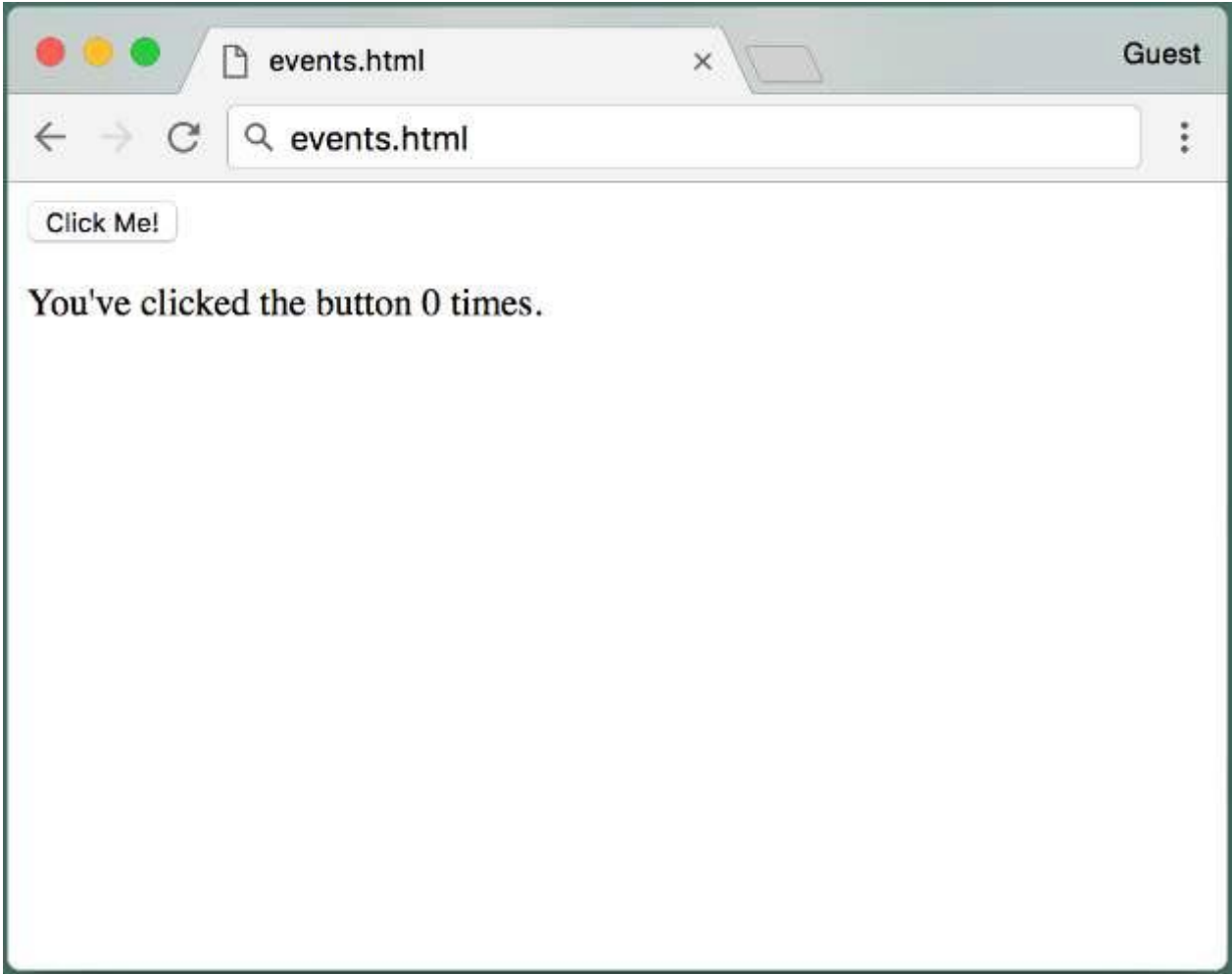
Winter 2023

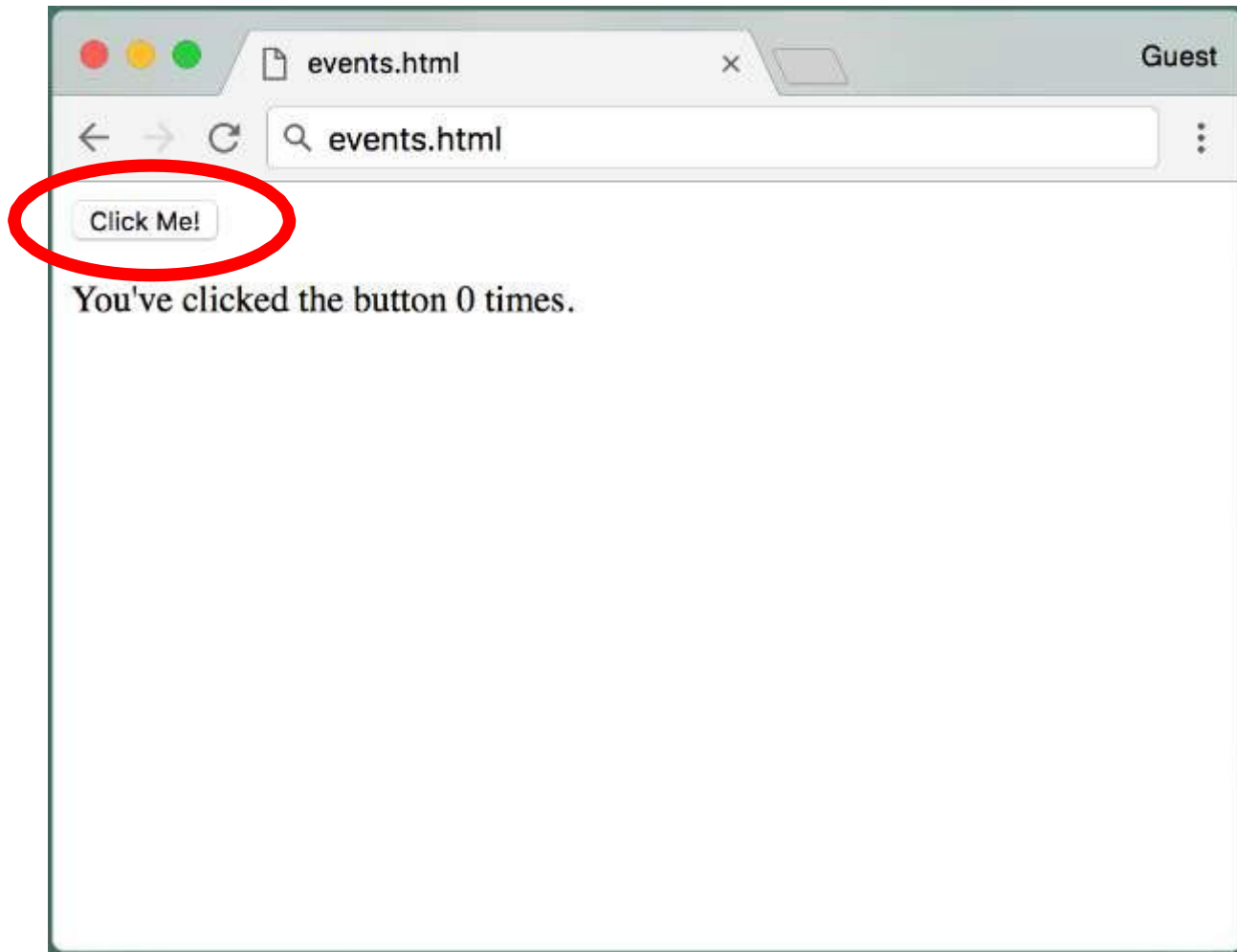
Sina Keshvadi

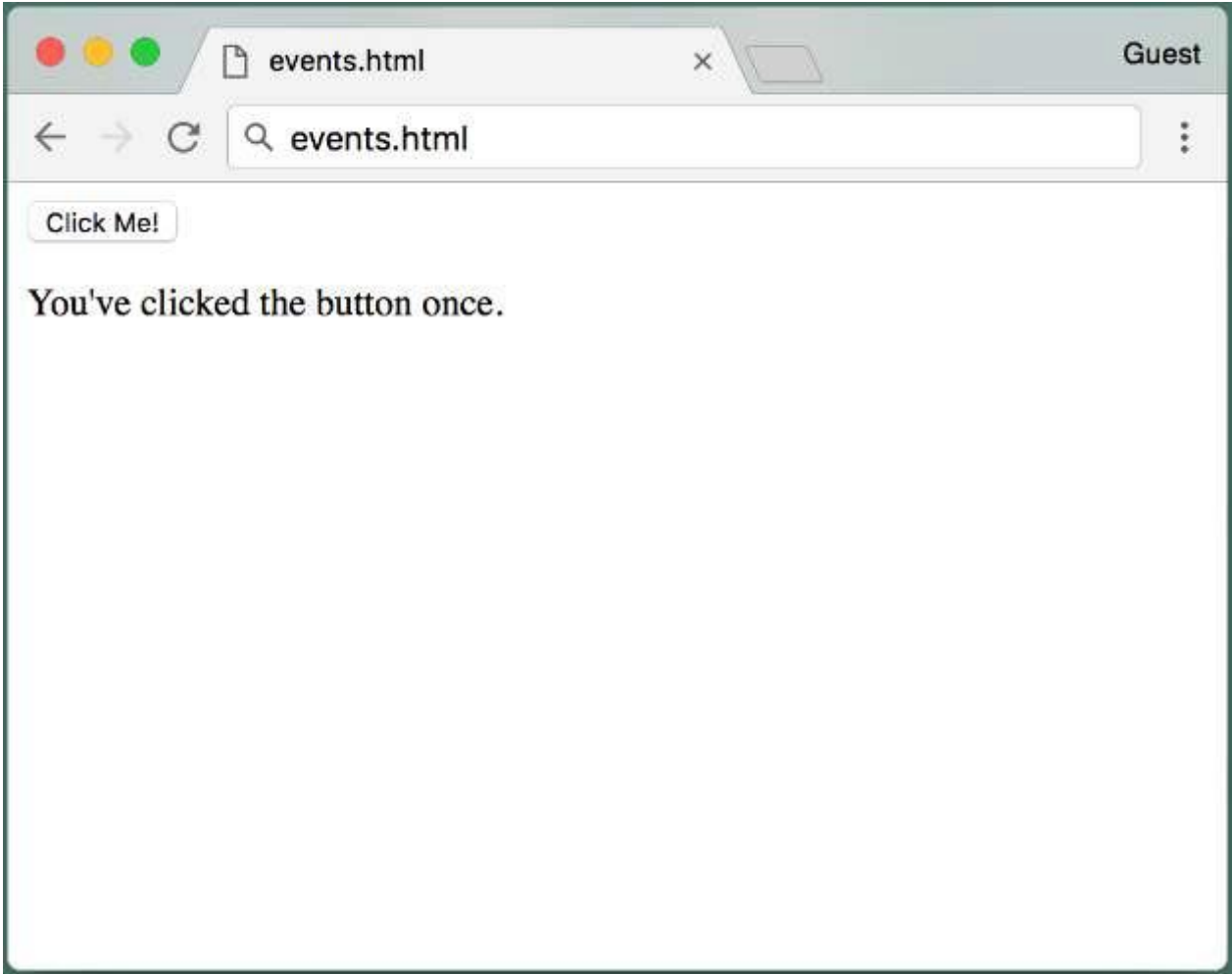
Thompson Rivers University

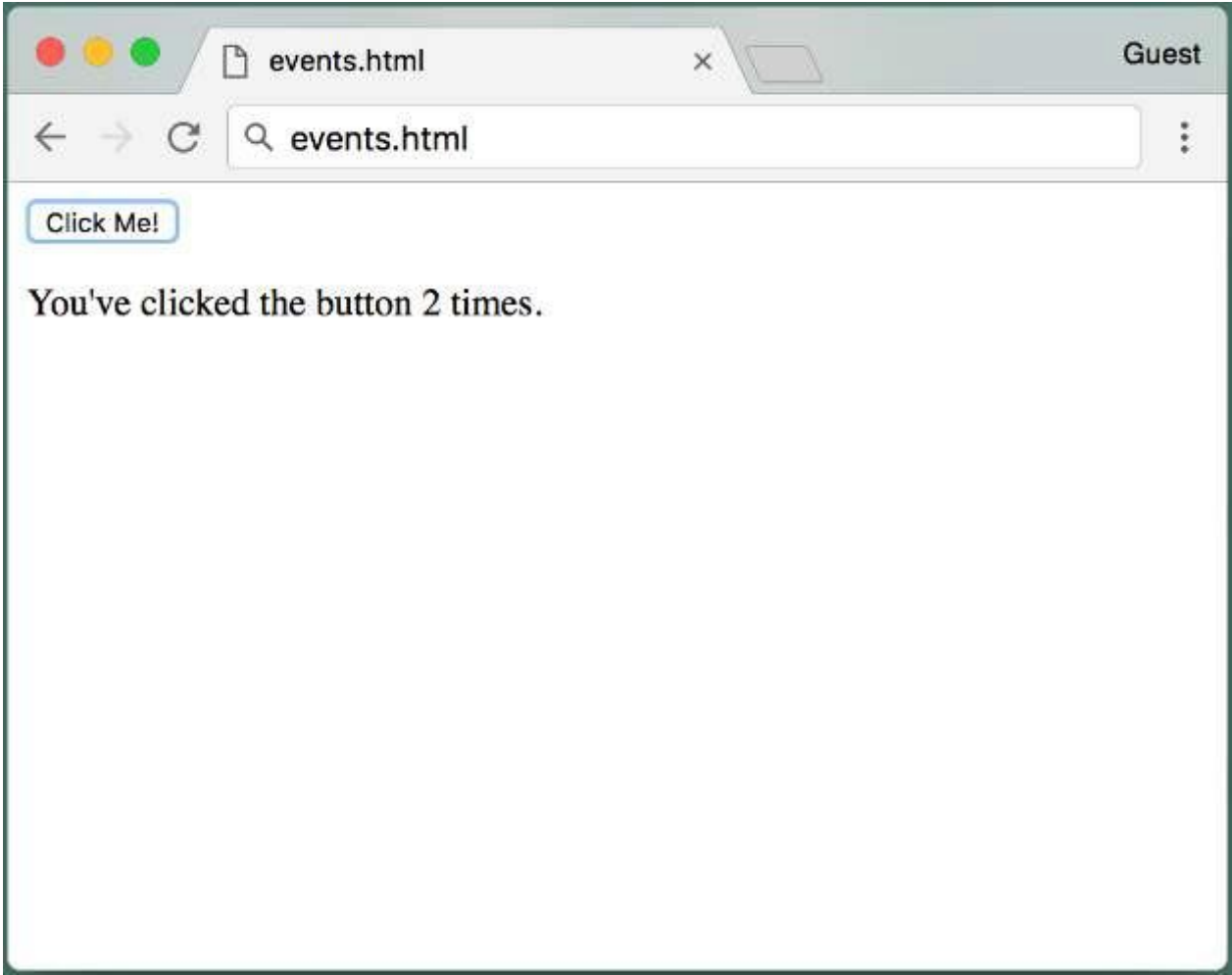
Review: HTML, JavaScript, DOM

- 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?









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

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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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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

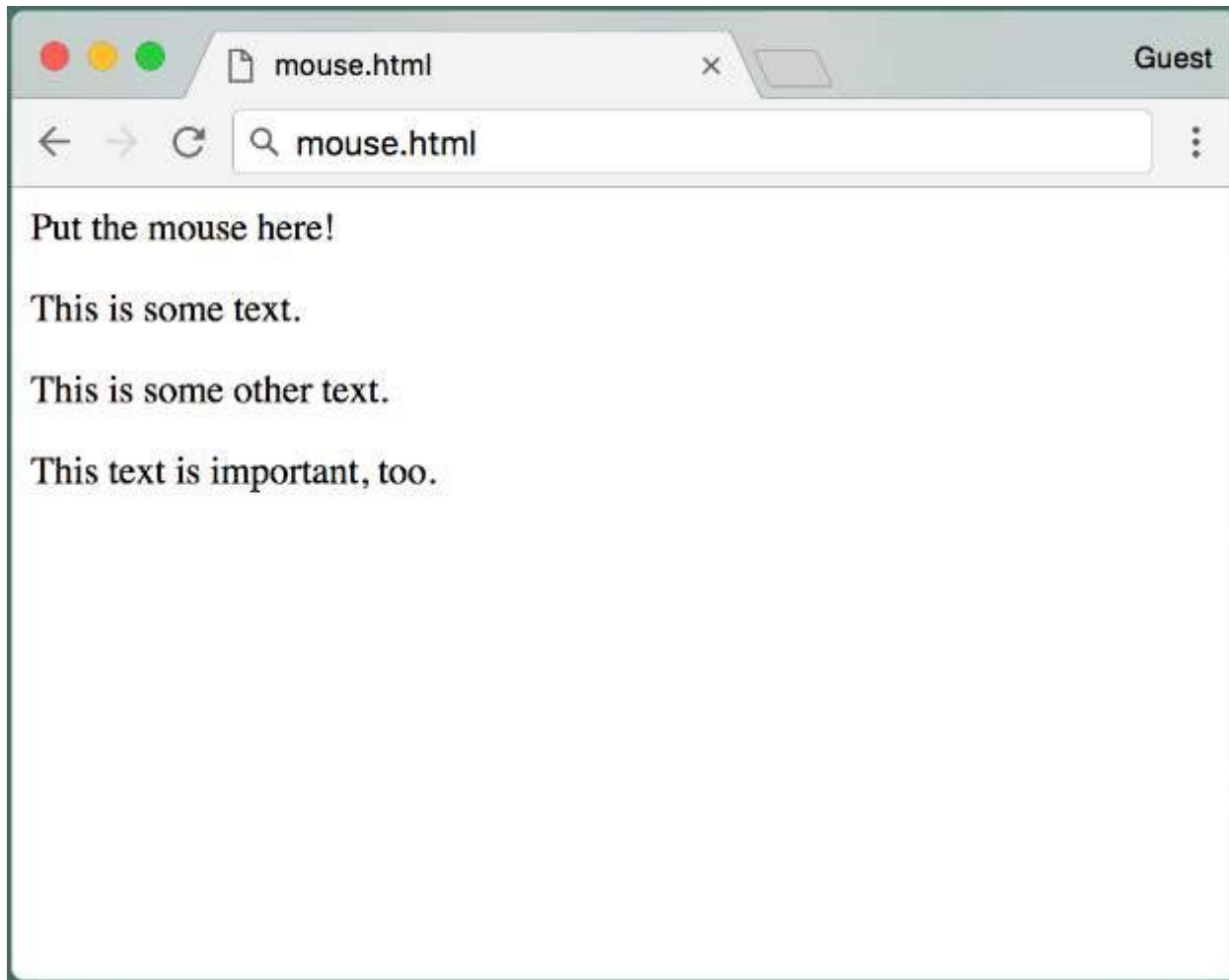
- Event-Driven programming is a form of asynchronous programming

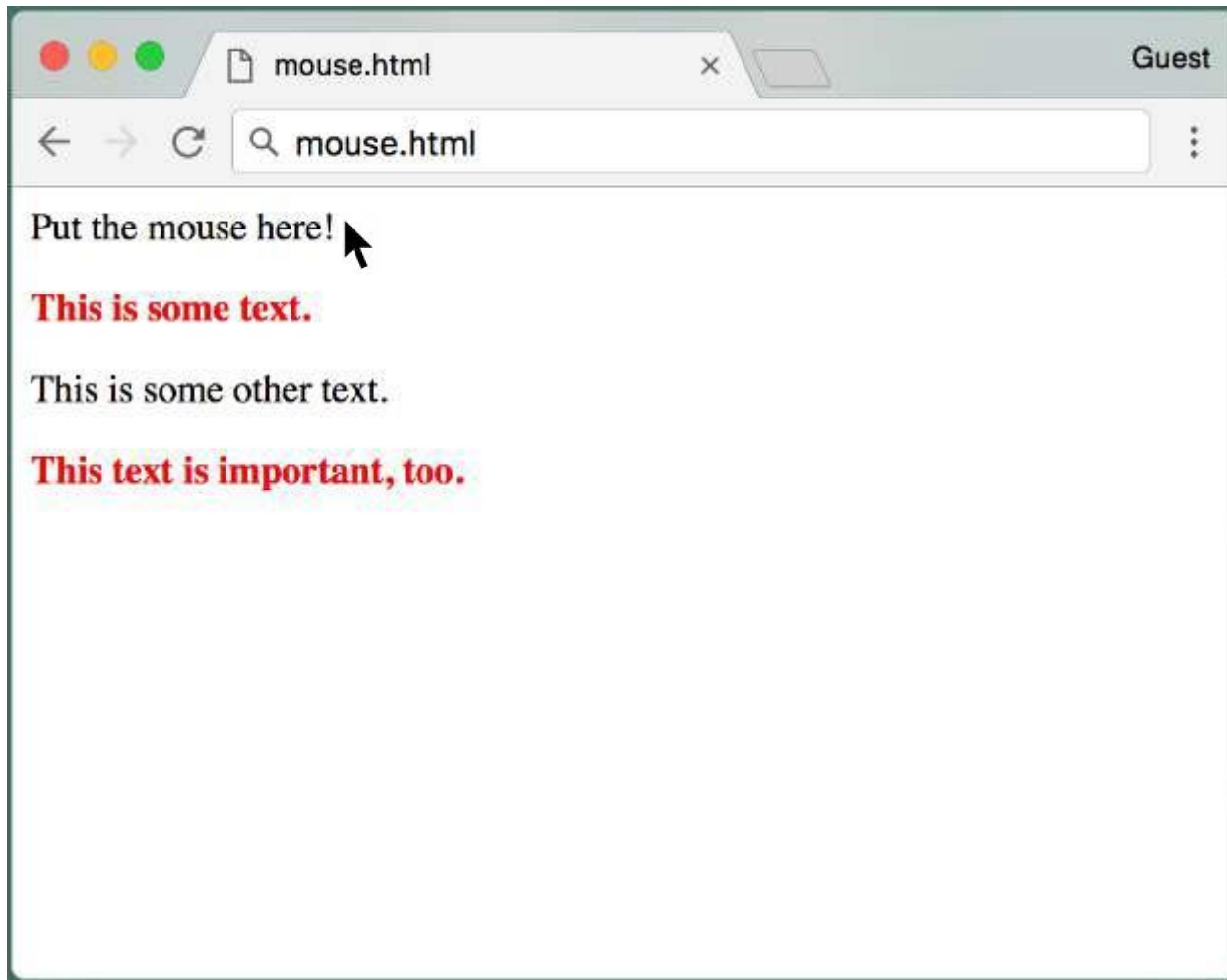
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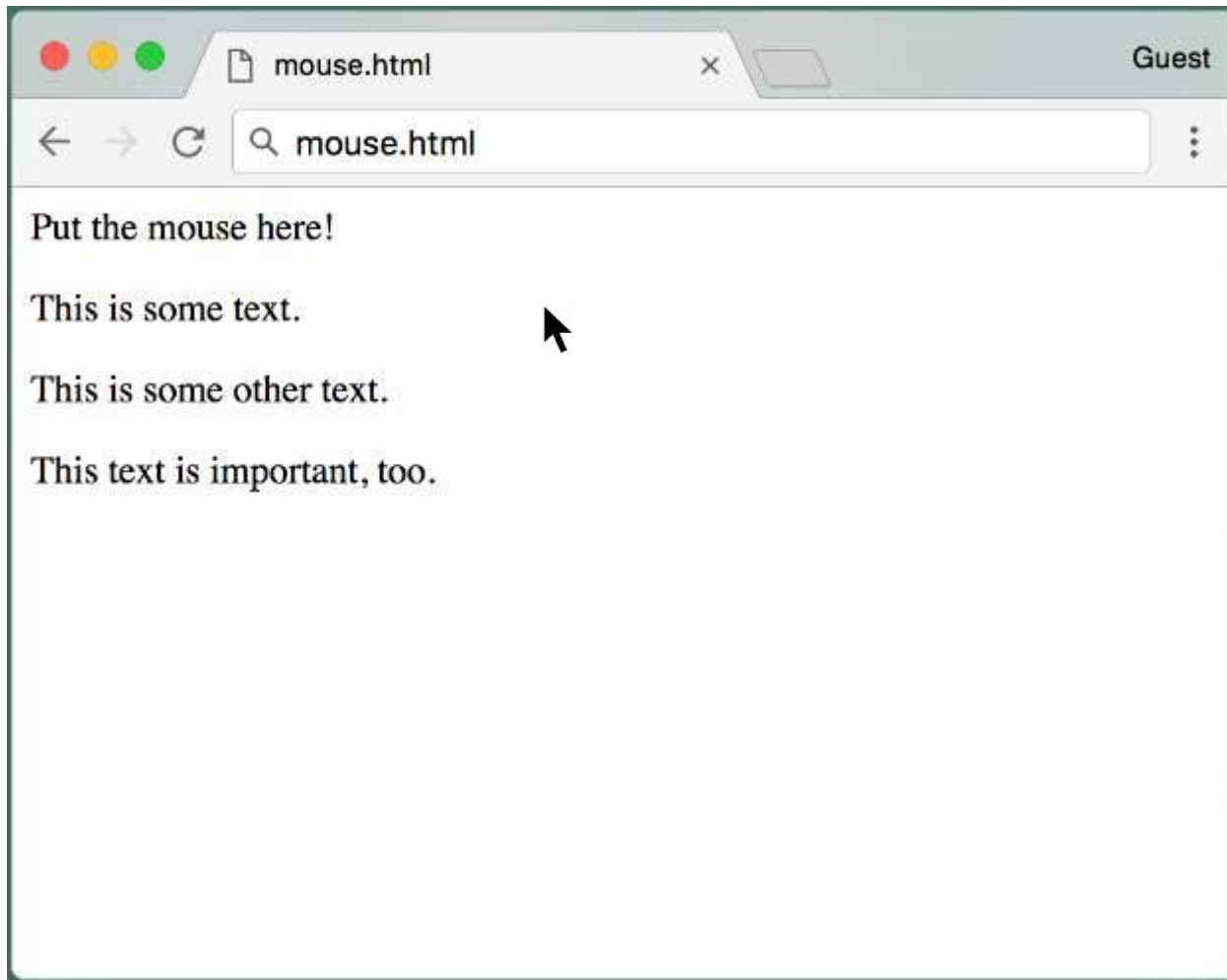
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 - Synchronous Way:
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- Event-Driven programming is a form of asynchronous programming
 - Synchronous Way:
 - You are expecting a user input
 - You continuously re-check a text field until the user has put in the required information
 - You run some code on the user input
 - 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>
<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';
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  function restore() {
    var divs = document.getElementsByClassName('highlightText');
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<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';
    }
  }

  function restore() {
    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);
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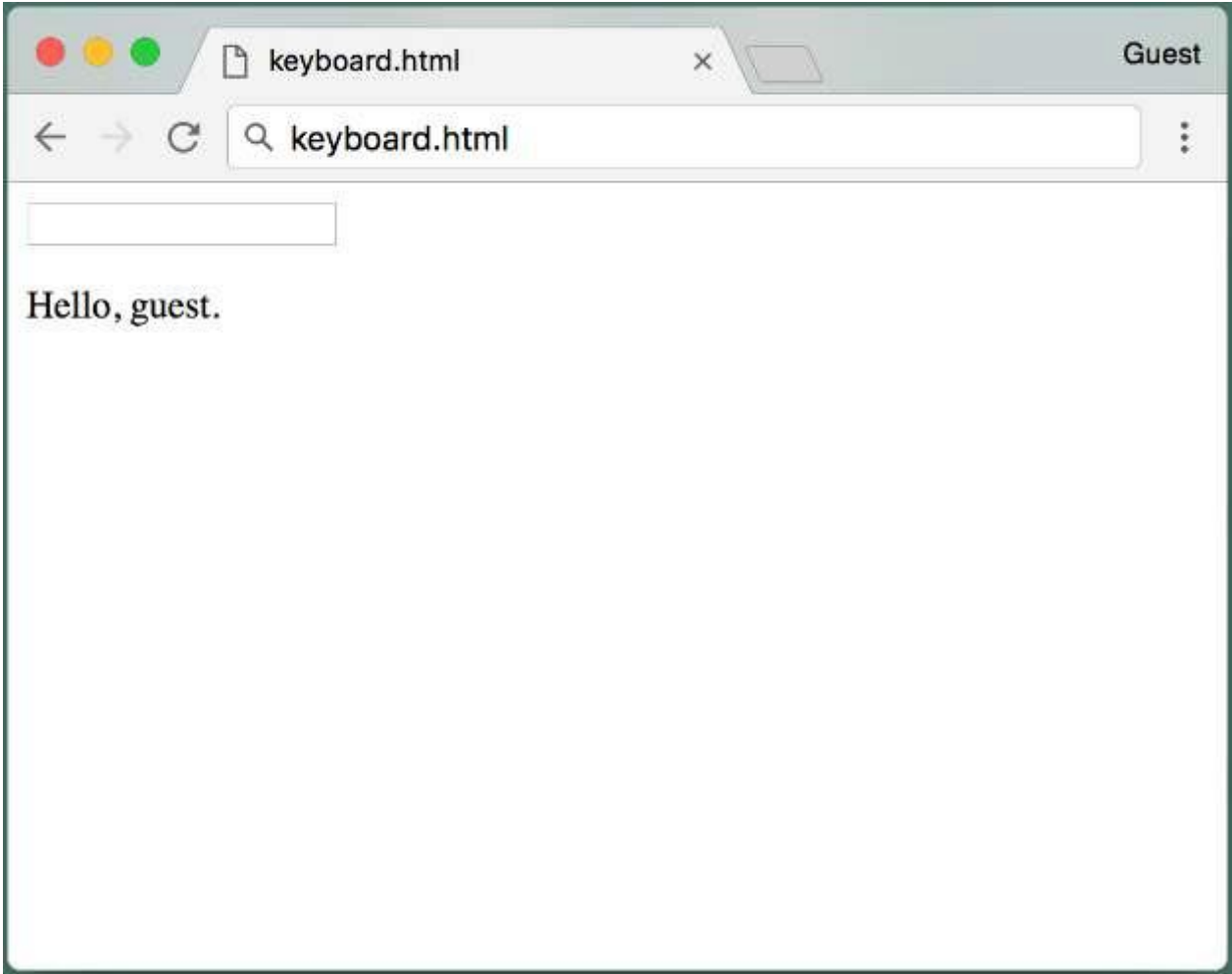
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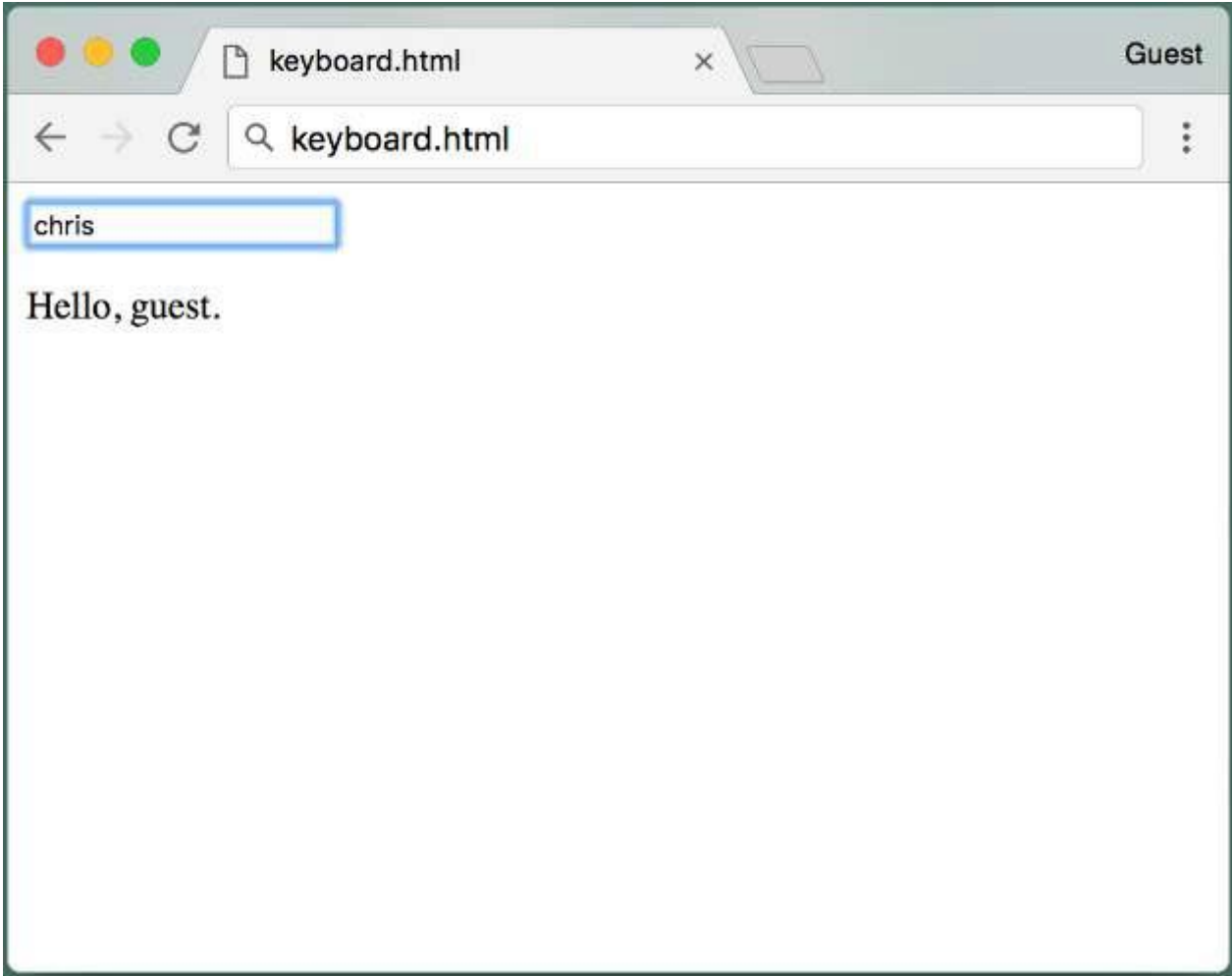
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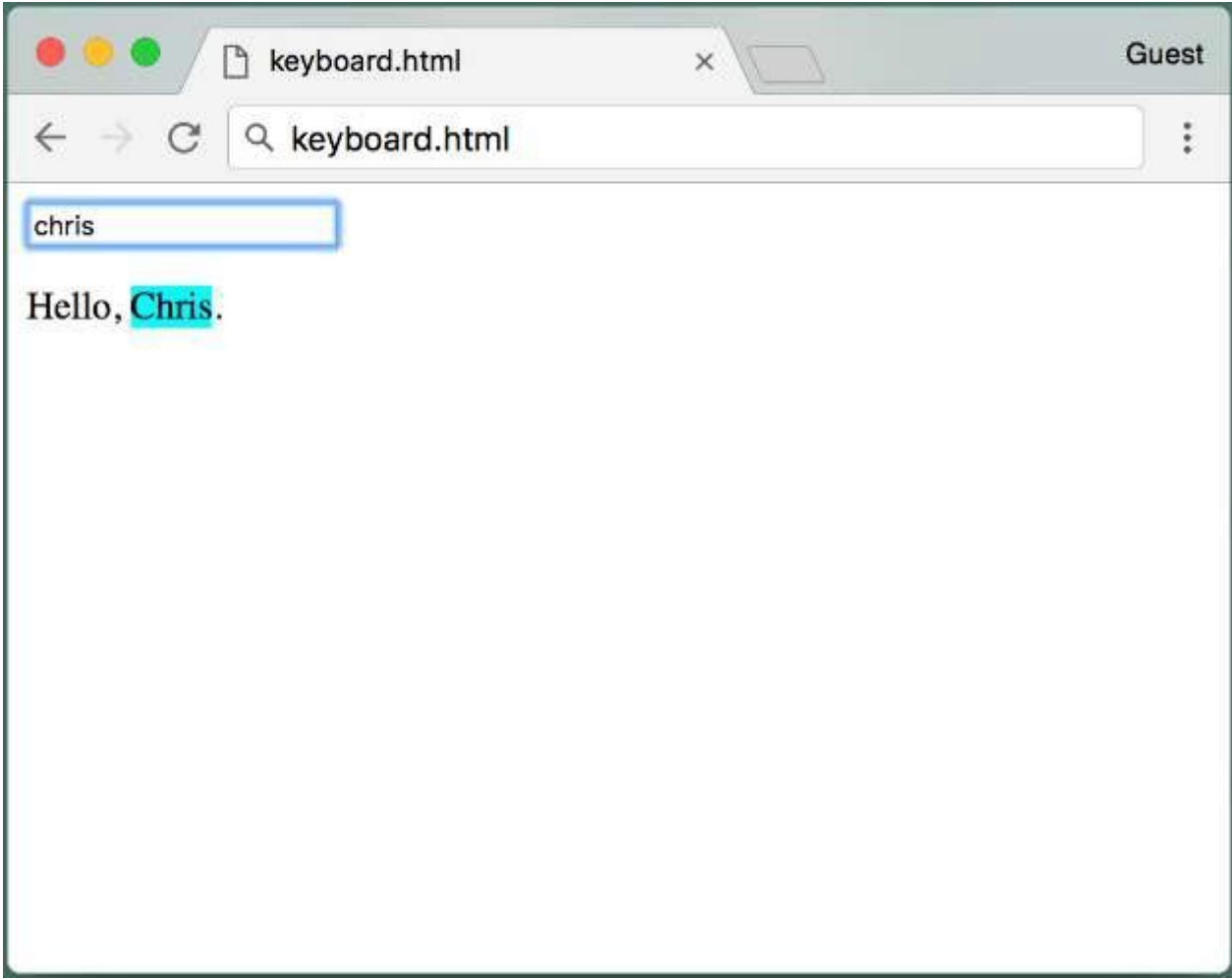
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```
<html>
<body>

<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'