Chapter 3: Introduction to HTML Part 2

CS 80: Internet Programming

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HTML5 Forms

HTML5 introduces new input types for forms

- These input types are self-validating
    - No need for javascript validation!
- However, the input data should be verified server-side

HTML5 Forms

New HTML5 form input types

- Each is part of a `<input type="type">` tag
- `color`: allows user to input a RGB, many browsers have color picker.
    - Input must be a hexadecimal value (color code)
- `date`: calendar date input, many browsers have a calendar-style picker

HTML5 Forms

New HTML5 form input types

- `datetime`: date and time input
    - yyyy-mm-ddThh:mm+ff in UTC (English time)
- `datetime-local`: date and time input
    - yyyy-mm-ddThh:mm+ff

HTML5 Forms

New HTML5 form input types

- `email`: email input
    - address@domain.com

HTML5 Forms

New HTML5 form input types

- `month`: month input
  - yyyy-mm
- `number`: any number input
  - min and max attributes set the min and max possible valid values

HTML5 Forms

New HTML5 form input types

- `range`: range slider between particular values - no validation required
  - min and max attributes set the min and max possible values
  - all values are valid

HTML5 Forms

New HTML5 form input types

- `search`: search field, behaves like a text input
- `tel`: telephone number input, **HTML5 does not validate this input!**

HTML5 Forms

New HTML5 form input types

- `time`: time input
  - hh:mm
- `url`: valid URL input
  - http://domain.com

HTML5 Forms

New HTML5 form input types

- `week`: input a specific week (nn is a week number, between 01 and 53
  - yyyy-Wnn
- If a browser does not support the specified input type, the type will be treated as "text".
  - Means you must *always* validate server-side!

Example: `new_forms.html`

```
1   <!DOCTYPE html>
2   <html>
3
4   <head>
5     <meta charset="utf-8">
6     <title>New Forms in HTML5</title>
7   </head>
8
9   <body>
10    <h3>Demo of the new HTML5 form input types</h3>
11    <form method="post" action="http://deitel.com">
12      <p>
13        <label>color:
14          <input type="color" />
15        </label>
16      </p>
17      <p>
18        <label>date:
19          <input type="date" />
20        </label>
21      </p>
22      <p>
23        <label>datetime:
24          <input type="datetime" />
25        </label>
26      </p>
27      <p>
28        <label>datetime-local:
29          <input type="datetime-local" />
30        </label>
31      </p>
32      <p>
33        <label for="email">email:
34          <input type="email" id="email" />
35        </label>
36      </p>
37      <p>
38        <label>month:
39          <input type="month" />
40        </label>
```

```
41        </p>
42        <p>
43          <label>number:
44            <input type="number" min="-50" max="100" />
45          </label>
46        </p>
47        <p>
48          <label>range:
49            <input type="range" min="5" max="10" value="7"/>
50          </label>
51        </p>
52        <p>
53          <label>search:
54            <input type="search" />
55          </label>
56        </p>
57        <p>
58          <label>tel:
59            <input type="tel" />
60          </label>
61        </p>
62        <p>
63          <label>time:
64            <input type="time" />
65          </label>
66        </p>
67        <p>
68          <label>url:
69            <input type="url" />
70          </label>
71        </p>
72        <p>
73          <label>week:
74            <input type="week" />
75          </label>
76        </p>
77        <input type="submit" value="Submit"/>
78        <input type="reset" value="Reset"/>
79      </form>
80  </body>
81
82  </html>
```

Input Focusing

Input `tabindex` attribute

- `tabindex` attribute enables controlling the order of input focus on TAB
- Ordering starts at 1

HTML5 Forms

New HTML5 form attributes

- `autofocus`: applied to input tag, automatically gives focus to this element (e.g. user can type immediately)
  - Can only be used on one input element per document

HTML5 Forms

New HTML5 form attributes

- `formnovalidate`: applied to input tag, allows a form to bypass validation
  - Must be applied to an input type
  - Means you must validate server side!!
- `novalidate`: applied to the form tag, allows a form to bypass validation
  - Means you must validate server side!!

HTML5 Forms

New HTML5 form attributes

- `placeholder`: applied to input tag, temporary text in an input field
  - Typically either the format of the input, or an example
  - Only applies to the following input types:
    * `text`, `search`, `url`, `tel`, `email`

HTML5 Forms

New HTML5 form attributes

- `required`: applied to input tag, requires the user to input the form element
  - Form cannot be submitted until they do
  - this is overridden by formnovalidate or novalidate

HTML5 Forms

New HTML5 form attributes

- `pattern`: applied to input tag, requires the input match the specified regular expression

Regular Expressions

A regular what?

- What's a regular expression (regex)?
    - A pattern matching tool
    - Text is described through a pattern, rather than a full description outlining every character

Regular Expressions

Telephone pattern explained

- Pattern:

```
1  \(\d{3}\) +\d{3}-\d{4}
```

- Prelimnary note: \ in regex is similar to & in HTML

    - / escapes the special character
        * Escaping means stripping it of its special meaning

Regular Expressions

Telephone pattern explained

- Pattern:

```
1  \(\d{3}\) +\d{3}-\d{4}
```

- (has a special meaning in regex, namely to start saving the matched pattern to a *group* (saving a section of the pattern for later use)

-) marks the end of the saved group

- You can then reference the group later with \ # where # is the group number used in the expression you wish to reference

- E.g. to reference the first saved group, use \1
- Because of this special meaning, we have to escape it

Regular Expressions

Telephone pattern explained

- Pattern:

```
1   \(\d{3}\) +\d{3}-\d{4}
```

- \d says we want to look for a digit ([0-9])
    - In this case, the escape gives d a special meaning - namely a digit
- {3} says we want to look for the previous pattern 3 times (3 digits)

Regular Expressions

Telephone pattern explained

- Pattern:

```
1   \(\d{3}\) +\d{3}-\d{4}
```

- "" is a literal space to look for
    - + means match the previous pattern 1 or more times
- Then, we look for 3 more digits, followed by a – then 4 more digits

HTML5 Forms

New HTML5 form attributes

- `autocomplete`: added to form or input tag, allows user to use previously submitted information when returning to the same form
    - You can turn autocomplete on or off for specific elements, overriding a value already set
    - Allows you to protect sensitive information from being autocomplete candidates
        * E.g. password, credit card info, etc.

datalist **element**

- Provides input options for a text form input
- As the user starts typing, the list will narrow
    - How the list narrows depends on the browser
- The datalist must be connected to an input through the `id` attribute
    - This is the glue between the list and the corresponding form input
    - Also means one list can be used on multiple form inputs

Example: adv_new_forms.html

```html
1  <!DOCTYPE html>
2  <html>
3
4  <head>
5    <meta charset="utf-8">
6    <title>New Forms in HTML5</title>
7  </head>
8
9  <body>
10   <h3>Demo of the new HTML5 form input types</h3>
11   <form method="post" action="http://deitel.com">
12     <p>
13       <label>color:
14         <input type="color"/>
15       </label>
16     </p>
17     <p>
18       <label>date:
19         <input type="date" />
20       </label>
21     </p>
22     <p>
23       <label>email:
24         <input type="email" placeholder="edmonds_mark@smc.edu"
                autofocus/>
25       </label>
26     </p>
27     <p>
28       <label>number:
29         <input type="number" min="-50" max="100" />
```

```
30          </label>
31        </p>
32        <p>
33          <label>range:
34            <input type="range" min="5" max="10" value="7"/>
35          </label>
36        </p>
37        <p>
38          <label>tel:
39            <input type="tel" pattern = "\(\d{3}\) +\d{3}-\d{4}"
                 placeholder="(###) ###-####" />
40          </label>
41          <input type="tel" placeholder="telephone">
42        </p>
43        <p>
44          <label>url:
45            <input type="url" required />
46          </label>
47        </p>
48        <input type="submit" value="Submit" />
49        <input type="reset" value="Reset" />
50      </form>
51
52      <h3>Form without validation through form submit input type (
           formnovalidate)</h3>
53
54      <form action="http://deitel.com">
55        <p>
56          <label>number:
57            <input type="number" autofocus />
58          </label>
59        </p>
60        <p>
61          <label>url:
62            <input type="url" required />
63          </label>
64        </p>
65        <input type="submit" value="Submit" formnovalidate />
66        <input type="reset" value="Reset" />
67      </form>
68
69      <h3>Form without validation through form tag (novalidate)</h3>
70
```

```
71    <form action="http://deitel.com" novalidate autocomplete="on">
72      <p>
73        <label>number:
74          <input type="number" id="num" autofocus />
75        </label>
76      </p>
77      <p>
78        <label>url:
79          <input type="url" id="url" required />
80        </label>
81      </p>
82      <p>
83        <!-- for connects to input with id="pt" for autofocus when parent
             /child relationship does not exist-->
84        <label for="pt">
85          plain text:
86        </label>
87        <input type="text" id="pt" required autocomplete="off"/>
88      </p>
89      <p>
90        <label for="month">Month:
91          <input type="text" id="month" list="months"/>
92          <datalist id="months">
93            <option value = "January">
94            <option value = "February">
95            <option value = "March">
96            <option value = "April">
97            <option value = "May">
98            <option value = "June">
99            <option value = "July">
100           <option value = "August">
101           <option value = "September">
102           <option value = "October">
103           <option value = "November">
104           <option value = "December">
105         </datalist>
106       </label>
107     </p>
108     <input type="submit" value="Submit" />
109     <input type="reset" value="Reset" />
110   </form>
111 </body>
112
```

```
113   </html>
```

Example: `fig3_17.html`

```
 1  <!DOCTYPE html>
 2  <!-- Fig. 3.17: autocomplete.html -->
 3  <!-- New HTML5 form autocomplete attribute and datalist element. -->
 4  <html>
 5
 6  <head>
 7      <meta charset="utf-8">
 8      <title>New HTML5 autocomplete Attribute and datalist Element</title
          >
 9  </head>
10
11  <body>
12      <h1>Autocomplete and Datalist Demo</h1>
13      <p>This form demonstrates the new HTML5 autocomplete attribute and
          the datalist element.
14      </p>
15      <!-- turn autocomplete on -->
16      <form method="post" autocomplete="on">
17          <p>
18              <label>First Name:
19                  <input type="text" id="firstName" placeholder="First
                      name" /> (First name)
20              </label>
21          </p>
22          <p>
23              <label for="lastName">Last Name:
24              </label>
25              <input type="text" id="lastName" placeholder="Last name" />
                  (Last name)
26          </p>
27          <p>
28              <label>Email:
29                  <input type="email" id="email" placeholder="name@domain
                      .com" /> (name@domain.com)
30              </label>
31          </p>
32          <p>
```

```
33              <label for="txtList">Birth Month:
34                  <input type="text" id="txtList" placeholder="Select a
                        month" list="months" />
35                  <datalist id="months">
36                      <option value="January">
37                      <option value="February">
38                      <option value="March">
39                      <option value="April">
40                      <option value="May">
41                      <option value="June">
42                      <option value="July">
43                      <option value="August">
44                      <option value="September">
45                      <option value="October">
46                      <option value="November">
47                      <option value="December">
48                  </datalist>
49              </label>
50          </p>
51          <p>
52              <input type="submit" value="Submit" />
53              <input type="reset" value="Clear" />
54          </p>
55      </form>
56  </body>
57
58  </html>
```

Page structure elements

- header: used to specify the header of the webpage, but can actually be included multiple times
    - Used to give introductory content or navigational links
- footer: used to specify the footer of the webpage, but can actually be included multiple times
    - Used to give authorship information, copyright, contact, sitemap, etc

Page structure elements

- time: used to identify a date, a time, or both
- nav: used to group navigational links

- Do not place all links in the nav element, only the navigational ones (could be in the header or the footer typically)
- `figure`: describes a figure, used to group a `figcaption` and the `img` tag
- `figcaption`: provides a caption for the corresponding figure

Page structure elements

- `article`: specifies independent, self-contained content
    - Can be nested
    - Intended for forum posts, blog posts, news story, commentary, etc
- `details`: provides information about a specific topic
- `summary`: displays summary of content inside of a `details` tag
    - The details of the summary are contained in a `details`tag

Page structure elements

- `section`: provides a section-based structure to a page; similar to
- `article`, but more general
    - Can be nested
    - Used frequently with `id` attributes for internal linking
    - Typically also comes with a header of some kind
- `aside`: describes content related to something, but not critical
    - Could be background history or related information

Page structure elements

- `meter`: shows an amount
    - Similar to a `range` (but is not input), or a loading bar (but does not animate)
- `mark`: highlight enclosed text
- `wbr`: controls when to break a word when text wrapping to the next line
    - Would this require a closing tag?

Example: `new_elements.html`

```
1  <!DOCTYPE html>
2  <!-- Fig. 3.18: sectionelements.html -->
3  <!-- New HTML5 section elements. -->
```

```
 4  <html>
 5
 6  <head>
 7    <meta charset="utf-8">
 8    <title>New HTML5 Section Elements</title>
 9  </head>
10
11  <body>
12    <header>
13      <!-- header element creates a header for the page -->
14      <img src="deitellogo.jpeg" alt="Deitel logo" />
15      <h1>Welcome to the Deitel Buzz Online</h1>
16      <!-- time element inserts a date and/or time -->
17      <time>2012-01-17</time>
18    </header>
19
20    <section id = "1">
21    <!-- Begin section 1 -->
22      <nav>
23        <!-- nav element groups navigation links -->
24        <h2> Recent Publications</h2>
25        <ul>
26          <li>
27            <a href = "http://www.deitel.com/books/iw3htp5">Internet &
                 World Wide Web How to Program, 5/e</a>
28          </li>
29          <li>
30            <a href = "http://www.deitel.com/books/androidfp/">Android
                 for Programmers: An App-Driven Approach</a>
31          </li>
32          <li>
33            <a href = "http://www.deitel.com/books/iphonefp">iPhone for
                 Programmers: An App-Driven Approach</a>
34          </li>
35          <li>
36            <a href = "http://www.deitel.com/books/jhtp9/">Java How to
                 Program, 9/e</a>
37          </li>
38          <li>
39            <a href = "http://www.deitel.com/books/cpphtp8/">C++ How to
                 Program, 8/e</a>
40          </li>
```

```
41          <li><a href = "http://www.deitel.com/books/vcsharp2010htp">
                Visual C# 2010 How to Program, 4/e</a>
42          </li>
43          <li>
44            <a href = "http://www.deitel.com/books/vb2010htp">Visual
                  Basic 2010 How to Program</a>
45          </li>
46        </ul>
47      </nav>
48    </section>
49
50    <section id = "2">
51    <!-- Begin section 2 -->
52      <h2>How to Program Series Books</h2>
53      <h3><em>Java How to Program, 9/e</em></h3>
54
55      <figure>
56      <!-- figure element describes the image -->
57        <img src = "jhtp.jpg" alt = "Java How to Program, 9/e" />
58        <!-- figurecaption element inserts a figure caption -->
59        <figcaption>
60          <em>Java How to Program, 9/e</em>cover.
61        </figcaption>
62      </figure>
63      <!--article element represents content from another source -->
64
65      <article>
66        <header>
67          <h5>From
68            <em>
69              <a href = "http://www.deitel.com/books/jhtp9/">Java How to
                    program, 9/e: </a>
70            </em>
71          </h5>
72        </header>
73        <p>Features include:
74        <ul>
75          <!-- mark element highlights text -->
76          <li>Rich coverage of fundamentals, including <mark>two
                  chapters on control statements.</mark></li>
77          <li>Focus on <mark>real-world examples.</mark></li>
78          <li><mark>Making a Difference exercises set.</mark></li>
```

```
79          <li>Early introduction to classes, objects, methods and
                strings.</li>
80          <li>Integrated exception handling.</li>
81          <li>Files, streams and object serialization.</li>
82          <li>Optional modular sections on language and library
                features of the new Java SE 7.</li>
83          <li>Other topics include: Recursion, searching, sorting,
                generic collections, generics, data structures, applets,
                multimedia, multithreading, databases/JDBC&trade;, web-app
                 development, web services and an optional ATM Object-
                Oriented Design case study.</li>
84        </ul>
85        <!-- summary element represents a summary for the -->
86        <!-- content of the details element -->
87        <details>
88          <summary>Recent Edition Testimonials</summary>
89          <ul>
90            <li>"Updated to reflect the state of the art in Java
                  technologies; its deep and crystal clear explanations
                  make it indispensable. The social-consciousness [Making
                  a Difference] exercises are something really new and
                  refreshing." <strong>&mdash;Jos&eacute; Antonio Gonz&
                  aacute;lez Seco, Parliament of Andalusia</strong></li>
91            <li>"Gives new programmers the benefit of the wisdom
                  derived from many years of software development
                  experience."<strong> &mdash;Edward F. Gehringer, North
                  Carolina State University</strong></li>
92            <li>"Introduces good design practices and methodologies
                  right from the beginning. An excellent starting point
                  for developing high-quality robust Java applications." <
                  strong>&mdash;Simon Ritter, Oracle Corporation</strong
                  ></li>
93            <li>"An easy-to-read conversational style. Clear code
                  examples propel readers to become proficient in Java." <
                  strong>&mdash;Patty Kraft, San Diego State University</
                  strong></li>
94            <li>"A great textbook with a myriad of examples from
                  various application domains&mdash; excellent for a
                  typical CS1 or CS2 course." <strong>&mdash;William E.
                  Duncan, Louisiana State University</strong></li>
95          </ul>
96        </details>
97      </p>
```

```
 98       </article>
 99       <!-- aside element represents content in a sidebar that's -->
100       <!-- related to the content around the element -->
101       <aside>
102         The aside element is not formatted by the browsers.
103       </aside>
104       <h2>Deitel Developer Series Books</h2>
105       <h3><em>Android for Programmers: An App-Driven Approach</em></h3>
106       Click <a href = "http://www.deitel.com/books/androidfp/">here</a>
               for more information or to order this book.
107       <h2>LiveLessons Videos</h2>
108       <h3><em>C# 2010 Fundamentals LiveLessons</em></h3>
109       Click <a href = "http://www.deitel.com/Books/LiveLessons/">here</a>
               for more information about our LiveLessons videos.
110    </section>
111
112    <section id = "3"> <!-- Begin section 3 -->
113      <h2>Results from our Facebook Survey</h2>
114      <p>If you were a nonprogrammer about to learn Java for the first
             time, would you prefer a course that taught Java in the context
             of Android app development? Here are the results from our survey
             :</p>
115      <!-- meter element represents a scale within a range -->
116      0 <meter min = "0" max = "54" value = "14"></meter> 54
117      <p>Of the 54 responders, 14 (green) would prefer to learn Java in
             the context of An<wbr>droid app development.</p>
118    </section>
119    <!-- footer element represents a footer to a section or page, -->
120    <!-- usually containing information such as author name, -->
121    <!-- copyright, etc. -->
122    <footer>
123    <!-- wbr element indicates the appropriate place to break a -->
124    <!-- word when the text wraps -->
125      <h6>&copy; 1992-2012 by Deitel &amp; Associ<wbr>ates, Inc. All
             Rights Reserved.<h6>
126      <!-- address element represents contact information for a -->
127      <!-- document or the nearest body element or article -->
128      <address>
129        Contact us at <a href = "mailto:deitel@deitel.com">deitel@deitel.
             com</a>
130      </address>
131    </footer>
132
```

```
133  </body>
134  </html>
```

Tools in a Toolbox

Remember, these are general guidelines. HTML is a like a toolbox; you are free to use them as you see fit.

A hammer is better at nailing than a saw. In general, it's best to stick to the convention.

Advanced HTML5

Video

- `controls` attribute (no arguments/assignment) allows you to add video control buttons, such as play, pause, volume
- `height`and `width` can be added to control the size of the video
- `muted`will start the video initially muted
- `loop` will determine whether or not the video should loop after finishing

Advanced HTML5

Video

- `autoplay`will start the video as soon as it loads
- The `video` tag is dissimilar from the `img` tag
  – You can use the video tag as a void tag (like an `img` tag) or you can specify multiple `source` tags
  – `source` tags specify a video file and a type
    * A `video` tag can have multiple `source` tags; the browser will play the first type supported.
    * If no types are supported, the text in between the `video` tag will be displayed.

Advanced HTML5

Audio

- Extremely similar to playing video
  – Only difference with video is no `height` and `width` attribute

- controls, autoplay, loop, muted are all the same
- Must specify an audio file (like MP3) instead of video

Example: `audio.html`

```
1  <h3>Audio with single source</h3>
2  <audio src="track.mp3" width="320" height="240" controls>
3
4  <h3>Audio with multiple sources</h3>
5  <audio width="320" height="240" controls>
6      <source src="track.mp3" type="audio/mp3">
7      <source src="track.ogg" type="audio/ogg">
8      Your browser does not support the audio tag.
9  </audio>
```

Advanced HTML5

Canvas

- canvas: allows you to draw 2D and 3D drawings on the screen
  - This requires javascript, so just hold on, we will go over this later!