COMP519 Web Programming
Lecture 9: HTML (HTML5 Elements: Part 3)
Handouts

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Contents

Forms

- A form is an element that contains form controls, such as text fields, buttons, checkboxes, range controls, or color pickers
- Forms allow users to enter data which can then be sent to a web server for processing
- A `form` element has several (optional) attributes, including
  - `action`: URL to use for form submission
  - `method`: HTTP method to use for form submission (`get` or `post`)
  - `enctype`: encoding type to use for form submission
  - `novalidate`: form is not validated during submission

```
<form action="https://sam.csc.liv.ac.uk/COMP/Calendar.pl"
      method="post" enctype="text/plain">
</form>
```

- A form can be submitted and on submission the data entered via the form controls will be send to the URL in `action` using the HTTP request method in `method` with encoding type `enctype`

Forms

- A form is an element that contains form controls, such as text fields, buttons, checkboxes, range controls, or color pickers
- HTML5 introduced a number of additional form controls and attributes for all form controls, but browser support is partial
  - ⇝ Always test your forms with a range of browsers (Apple Safari, Google Chrome, Mozilla Firefox, MS IE, MS Edge)

Label

- In order for a form to be usable, each form control should be accompanied by an indication of what it is for or how it should be used

  Example: 'Surname' or 'Enter your surname' next to a field into which you are meant to enter your surname
- A `label` element represents such an indication (a caption)
- A `label` element can be associated with a specific form control either using its `for` attribute or by putting the form control inside the label element itself

```
<label for="s1">Surname:</label>
<input name="surname" id="s1" type="text">

<label>First name(s): <input name="first" id="f1" type="text"></label>
```

Input

- The input element represents a 'field' that allows the user to enter data of a certain type
- The type attribute of an input element determine what type of data can be entered and in what form

Value of type	Data type	Form control
text	Text with no line breaks	Text field
tel	Phone number	Text field
date	Date (Year/Month/Day)	Date control
email	E-mail address	Text field
file	Zero or more files	Button and file selector
color	sRGB color	Button and color picker
number	Floating-point number	Text field or spinner
password	Password	Text field with obscured input

Input

- The input element represents a 'field' that allows the user to enter data of a certain type
- The type attribute of an input element determine what type of data can be entered and in what form

Value of type	Data type	Form control
checkbox	A set of zero or more values from a predefined list	Checkbox
radio	An enumerated value	Radio button
button		Button
submit	Initiates form submission	Button
reset	Resets form	Button

- Depending on the value of the type attribute, an input element will have additional attributes that define its behaviour

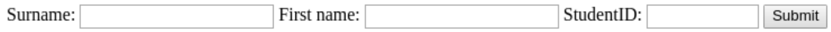
Input

- The input element represents a ‘field’ that allows the user to enter data of a certain type
- Depending on the value of the type attribute, an input element will have additional attributes that define its behaviour
- Common attributes include
  - id: unique id used to identify the element with the document
  - name: (unique) name used by the form processor to access input
  - autofocus: automatically focus on this form control when the page is loaded
  - disabled: whether the form control is disabled
  - required: whether the form control is required to have a non-empty value for form submission

```
<input name="studentid" id="sid" type="number"
       min="190000000" max="999999999">
<input type="submit">
```

Input

```
<form action="process.php">
  <label for="s1">Surname:</label>
  <input name="surname" id="s1" type="text">
  <label>First name: <input name="first" id="f1" type="text">
  </label>
  <label>StudentID:  <input name="studentid" id="sid" type="number"
                           min="190000000" max="999999999"></label>
  <input type="submit">
</form>
```



- On submission, the web browser will construct pairs *name*=*value* where *name* is the value of the `name` attribute of one of the form controls and *value* is the input by the user for that form control
- A string composed of those pairs will be send to `process.php`

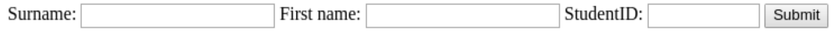
Example:

Peters, Amy Lee, and 201612345 are entered into the three fields

$\leadsto$ `surname=Peters`, `first=Amy+Lee`, and `studentid=201612345` are sent to `process.php`

Input

```
<form action="process.php">
  <label for="s1">Surname:</label>
  <input name="surname" id="s1" type="text">
  <label>First name: <input name="first" id="f1" type="text">
  </label>
  <label>StudentID:  <input name="studentid" id="sid" type="number"
                            min="190000000" max="999999999"></label>
  <input type="submit">
</form>
```



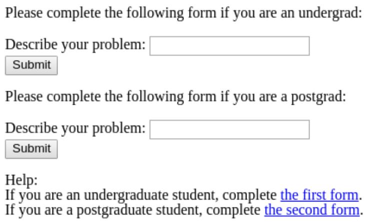
- This form can be submitted by either activating the 'Submit' button or by pressing the return key within one of the three input fields
- Form submission is possible even with all input fields being empty, even the one for the StudentID
  $\leadsto$ we need to add the `required` attribute to prevent empty inputs
- The StudentID field accepts floating point numbers between the specified `min` and `max` values
  $\leadsto$ `1.9e8` is accepted and `studentid=1.9e8` send to `process.php`

Names versus IDs

```
<p>Please complete the following form if you are an undergrad:</p>
<form id="formUG" action="process-comments.php">
  <input type="hidden" name="level" value="UG">
  <label for="c1">Describe your problem:</label>
  <input type="text"   name="comment" id="c1" maxlength="250" required>
  <br/><input type="submit">
<form>
<p>Please complete the following form if you are a postgrad:</p>
<form id="formPG" action="process-comments.php">
  <input type="hidden" name="level" value="PG">
  <label for="c2">Describe your problem:</label>
  <input type="text"   name="comment" id="c2" maxlength="250" required>
  <br/><input type="submit">
</form>
<p>
  Help:<br />
  If you are an undergraduate student,
  complete <a href="#c1">the first form</a>.<br />
  If you are a postgraduate student,
  complete <a href="#c2">the second form</a>.
</p>
```

Names versus IDs

```
<p>Please complete the following form if you are an undergrad:</p>
<form id="formUG" action="process-comments.php">
  <input type="hidden" name="level" value="UG">
  <label for="c1">Describe your problem:</label>
  <input type="text"   name="comment" id="c1" maxlength="250" required>
  <br/><input type="submit">
<form>
<p>Please complete the following form if you are a postgrad:</p>
<form id="formPG" action="process-comments.php">
  <input type="hidden" name="level" value="PG">
  <label for="c2">Describe your problem:</label>
  <input type="text"   name="comment" id="c2" maxlength="250" required>
  <br/><input type="submit">
</form>
<p>
  Help:<br />
  If you are an undergraduate student,
  complete <a href="#c1">the first form</a>.<br />
  If you are a postgraduate student,
  complete <a href="#c2">the second form</a>.
</p>
```


Please complete the following form if you are an undergrad:

Describe your problem:

Please complete the following form if you are a postgrad:

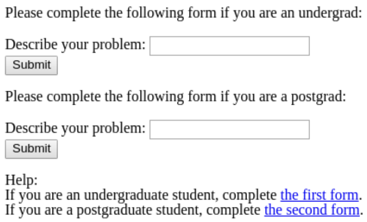
Describe your problem:

Help:
If you are an undergraduate student, complete the first form.
If you are a postgraduate student, complete the second form.

- Entering ‘None’ into the first form and activating the submit button sends `level=UG` and `comment=None` to `process-comments.php`
- Activating the hyperlink underlying ‘the first form’ focuses input on the form with id c1

Names versus IDs

```
<p>Please complete the following form if you are an undergrad:</p>
<form id="formUG" action="process-comments.php">
  <input type="hidden" name="level" value="UG">
  <label for="c1">Describe your problem:</label>
  <input type="text"   name="comment" id="c1" maxlength="250" required>
  <br/><input type="submit">
<form>
<p>Please complete the following form if you are a postgrad:</p>
<form id="formPG" action="process-comments.php">
  <input type="hidden" name="level" value="PG">
  <label for="c2">Describe your problem:</label>
  <input type="text"   name="comment" id="c2" maxlength="250" required>
  <br/><input type="submit">
</form>
<p>
  Help:<br />
  If you are an undergraduate student,
  complete <a href="#c1">the first form</a>.<br />
  If you are a postgraduate student,
  complete <a href="#c2">the second form</a>.
</p>
```


Please complete the following form if you are an undergrad:

Describe your problem:

Please complete the following form if you are a postgrad:

Describe your problem:

Help:
If you are an undergraduate student, complete the first form.
If you are a postgraduate student, complete the second form.

- Entering 'None' into the second form and activating the submit button sends `level=PG` and `comment=None` to `process-comments.php`
- Activating the hyperlink underlying 'the second form' focuses input on the form with id c2

⤳ `name` and `id` serve different purposes
still, programmers often use the same value for both
unless this is not possible (as in the example above)

Input: Submit

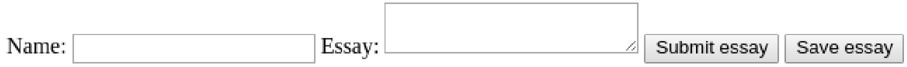
- An input element with type submit represents a button that, when activated, submits the form it is associated with
- Attributes include

`value`:	replaces the default label of the button
`name`:	(unique) name used by the form processor to access input
`formaction`:	Overwrite the
`formenctype`:	corresponding
`formmethod`:	attributes of
`formnovalidate`:	the form

```
<input type="submit">
<input type="submit" name="action" value="Submit essay">
<input type="submit" formaction="save.php">
```

Input: Submit (Example 1)

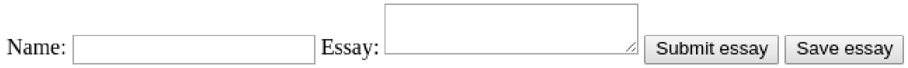
```
<form action="process.php" method="post">
  <label>Name:  <input name="fn" required></label>
  <label>Essay: <textarea name="essay" required></textarea></label>
  <input type="submit" name="action" value="Submit essay">
  <input type="submit" name="action" value="Save essay" formnovalidate>
</form>
```



- On activating the 'Submit essay' button it will be checked that both Name and Essay have been filled in; if so, the text entered will be send to `process.php` together with `action=Submit+essay`
- On activating the 'Save essay' button no check will take place; any text entered for Name and Essay will be send to `process.php` together with `action=Save+essay`
- The script `process.php` can perform the appropriate operations depending on the value of `action`

Input: Submit (Example 2)

```
<form>
  <label>Name:  <input name="fn" required></label>
  <label>Essay: <textarea name="essay" required></textarea></label>
  <input type="submit" formaction="submit.php" value="Submit essay">
  <input type="submit" formaction="save.php"   value="Save essay"
         formnovalidate>
</form>
```



- On activating the 'Submit essay' button it will be checked that both Name and Essay have bene filled in; if so, the text entered will be send to `submit.php`
- On activating the 'Save essay' button no check will take place; any text entered for Name and Essay will be send to `save.php`
- The scripts `submit.php` and `save.php` have been written specifically to perform the respective function

Input: Number

- An input element with type `number` represents a one line plain text field for the element's value
- Attributes include

• `value`:	shown as 'default' value in the text field
• `readonly`:	the value cannot be changed
• `min`:	minimum value allowed to be entered
• `max`:	maximum value allowed to be entered
• `step`:	granularity that is expected (and required) of the value
• `placeholder`:	a short hint describing the expected value of a text area (disappears as soon as the user enters a value)

```
<!-- The only allowed values below are 10, 12, 14                   -->
<input type="number" name="quantity" min="10" max="14" step="2" required>

<!-- The only allowed values below are 0.0 to 1.0 in steps of 0.1    -->
<input type="number" name="fraction" min="0" max="1" step="0.1" required>

<input type="number" name="age" placeholder="Enter your age">
<input type="number" name="studentid" min="190000000" max="999999999">
```

Input: Text

- An input element with type `text` represents a one line plain text field for the element's value
- Attributes include

• `value`:	shown as 'default' value in the text field
• `readonly`:	the value cannot be changed
• `size`:	visible width of the field in characters
• `minlength`:	minimum number of characters allowed to be entered
• `maxlength`:	maximum number of characters allowed to be entered
• `placeholder`:	a short hint describing the expected value of a text area (disappears as soon as the user enters a value)
• `pattern`:	a regular expression that the value has to match

```
<input type="text" name="surname" size="100" required>
<input type="text" name="department" value="Computer Science" readonly>
<input type="text" name="studentid" minlength="9" maxlength="9">
```

Input: Password

- An `input` element with type `password` represents a one line plain text field for the element's value
- Same as an `input` element with type `text`, except that thw web browser should should obscure the value that is being entered
- Has the same attributes as `input` element with type `text`

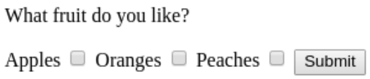
Input: Checkbox

- An input element with type `checkbox` represents a two-state control (checkbox)
- The return value of a checked checkbox is `on`, an unchecked checkbox returns nothing
- Attributes include

`value`:	replaces the 'default' return value
`checked`:	this element is selected by default

Most of the other attributes, for example, `readonly` are not available

```
<form action="process.php">
  <p>What fruits do you like?</p>
  <label>Apples  <input type="checkbox" name="fruit[]" value="a"></label>
  <label>Oranges <input type="checkbox" name="fruit[]" value="o"></label>
  <label>Peaches <input type="checkbox" name="fruit[]" value="p"></label>
  <input type="submit">
</form>
```



`fruit[]` is an array storing a subset of `{"a","o","p""}` depending on which checkboxes have been checked

Input: Radio

- A set of `input` elements with type `radio` represents a radio button group in which only one form control can be selected/set to true
- For `input` elements to belong to the same radio button group
  - they must be associated with the same form and
  - their `name`-attributes must have the same value
- Attributes include

`value`:	replaces the 'default' return value `on`
`checked`:	this element is selected by default

Most of the other attributes, for example, `readonly` are not available

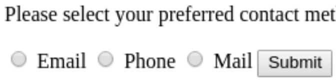
```
<form action="process.php">
  <p>Please select your preferred contact method:<p>
  <input type="radio" id="cc1" name="contact" value="email">
  <label for="cc1">Email</label>
  <input type="radio" id="cc2" name="contact" value="phone">
  <label for="cc2">Phone</label>
  <input type="radio" id="cc3" name="contact" value="mail">
  <label for="cc3">Mail</label>
  <input type="submit">
</form>
```

Input: Radio

- If no radio button within a group is selected when the associated form is submitted, then no value for the group is send to the server
  $\leadsto$ if the user must make a selection,
  then set the `required` attribute for at least one element
- If a radio button within a group is selected when the associated form is submitted, but the `value`-attribute of that `input` element is not set, then the default value `on` will be returned
  $\leadsto$ make sure that all `input`-elements within a radio button group
  have a non-empty `value`-attribute

Input: Radio

```
<form action="process.php">
  <p>Please select your preferred contact method:<p>
  <input type="radio" id="cc1" name="contact" value="email">
  <label for="cc1">Email</label>
  <input type="radio" id="cc2" name="contact" value="phone">
  <label for="cc2">Phone</label>
  <input type="radio" id="cc3" name="contact" value="mail">
  <label for="cc3">Mail</label>
  <input type=submit>
</form>
```


Please select your preferred contact method:

○ Email ○ Phone ○ Mail Submit

- No radio button is selected and no selection is required, so if we activate the submit button right away, no values will be send to `process.php`
  $\leadsto$ if we want to pre-select a button, then we should set the `checked` attribute for one of the elements
- If we select the first button and then activate the button, then `contact=email` will be send to `process.php`

Textarea

- A textarea element represents a multi-line text input control
- A textarea element can have several attributes, including

• id:	unique id used to identify the element with the document
• name:	(unique) name used by the form processor to access input
• cols:	the visible width of a text area (number)
• rows:	the visible height of a text areas (number)
• maxlength:	maximum number of characters that can be entered entering more is not possible
• placeholder:	a short hint describing the expected value of a text area (disappears as soon as the user enters a value)
• required:	specifies that a text area must be filled out
• wrap:	specifies whether newlines are preserved ("hard" $\rightsquigarrow$ yes / "soft" $\rightsquigarrow$ no)

```
<textarea name="problem1" id="p1" cols="10" rows="4" maxlength="35"
          required wrap="hard">Describe your problem</textarea>
<textarea name="problem2" id="p2" cols="10" rows="4" wrap="soft"
          placeholder="Describe your problem"></textarea>
```

Select

- A `select` element represents a drop-down menu with pre-defined options between which the user must select
- The content of a `select` element consists of a list of `option` elements that represent those options
- A `select`-element can have several attributes, including

• `id`:	unique id used to identify the element with the document
• `name`:	(unique) name used by the form processor to access input
• `multiple`:	allow multiple options to be selected
• `required`:	an option must be selected that has a non-empty value
• `disabled`:	the current selection can not be changed
• `size`:	number of options to show to the user

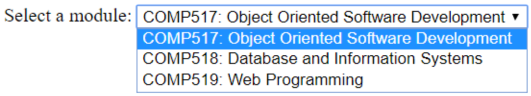
- An `option` element can have several attributes, including

• `label`:	the label used in the drop-down menu
• `value`:	the value returned for the option
• `selected`:	the option is selected by default
• `disabled`:	the option is shown but cannot be selected

Select

- A select element represents a drop-down menu with pre-defined options between which the user must select
(often preferred over a radio button group)
- The content of a select element consists of a list of option elements that represent those options

```
<label for="module">Select a module:</label>
<select name="module">
  <option value="COMP517">
    COMP517: Object Oriented Software Development
  </option>
  <option value="COMP518">
    COMP518: Database and Information Systems
  </option>
  <option value="COMP519">
    COMP519: Web Programming
  </option>
</select>
```


Select a module: COMP517: Object Oriented Software Development ▾
COMP517: Object Oriented Software Development
COMP518: Database and Information Systems
COMP519: Web Programming

Select

```
<form action="process.php">
  <label for="module">Select a module:</label>
  <select name="module">
   <option value="COMP517">
     COMP517: Object Oriented Software Development
   </option>
   <option value="COMP518">
     COMP518: Database and Information Systems
   </option>
   <option value="COMP519">
     COMP519: Web Programming
   </option>
 </select>
 <input type="submit">
</form>
```

- By default, the first option is selected
- If the selection is not changed and the user activates the submit button, then `module=COMP517` is sent to `process.php`
- In general, the value associated with the selected option will be send

Select

```
<form action="process.php">
  <label for="module">Select a module:</label>
  <select name="module">
   <option value="COMP517">
     COMP517: Object Oriented Software Development
   </option>
   <option value="COMP518" selected>
     COMP518: Database and Information Systems
   </option>
   <option value="COMP519">
     COMP519: Web Programming
   </option>
 </select>
 <input type="submit">
</form>
```

- Adding the attribute `selected` to the second option, makes it the option that is selected by default
- If the selection is not changed and the user activates the submit button, then `module=COMP518` is sent to `process.php`

Select

```
<form action="process.php">
  <label for="module">Your choice:</label>
  <select name="module" required>
   <option value="">Select a module</option>
   <option value="COMP517">
     COMP517: Object Oriented Software Development
   </option>
   <option value="COMP518">
     COMP518: Database and Information Systems
   </option>
   <option value="COMP519">
     COMP519: Web Programming
   </option>
 </select>
 <input type="submit">
</form>
```

- That an option with a non-empty value is pre-selected is often not desirable $\rightsquigarrow$ the user does not need to make a conscious choice
- Adding a default option with empty value and adding the attribute `required` to the `select` element forces the user to make a conscious choice

Revision and Further Reading

Read

- Chapter 9: Forms
- Chapter 19: More CSS Techniques (Styling Forms)

of

J. Niederst Robbins: Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics (5th ed).
O'Reilly, 2018.
E-book `https://library.liv.ac.uk/record=b5647021`