CS472 Web Programming
Lecture 4: Connecting with the Source

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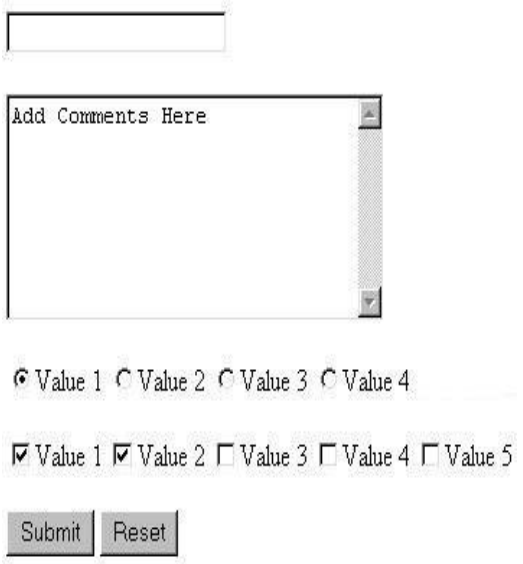
Wholeness Statement

- HTML forms generate and process user input. Users complete HTML forms using different data widgets , and the server will process the information submitted from the forms. *Forms are a communication mechanism, connecting a model with a remote view of the model and in this case providing input to the model. Forms collect and send information to the server like our sensory systems collect and send perceptions to our awareness.*

HTML forms

- Form: a group of UI controls that accepts information from the user and sends the information to a web server
- The information is sent to the server as a query string
- JavaScript can be used to create interactive controls (seen later)
- We can have multiple forms on a single webpage, but forms CANNOT be nested.



HTML form: **<form>**

The **<form>** tag is used to create an HTML form for user input.

The **<form>** element can contain one or more of the following form elements:

<input>, **<textarea>**, **<button>**, **<select>**, **<option>**, **<optgroup>**, **<fieldset>**, **<label>**

```
<form action="" method="" enctype="" novalidate
      autocomplete>
  Form controls
</form>
```

- **action** destination URL
- **method** get, post
- **enctype** application/x-www-form-urlencoded, multipart/form-data, text/plain
- **novalidate** (HTML5) specifies that the form should not be validated when submitted
- **autocomplete** (HTML5) on, off

Form Example

```
<form action="http://www.google.com/search">
      <div> Let's search Google <input name="q" />
      <input type="submit" /> </div>
</form>
```

See example: lecture4_examples/form.html

Main Points

- An HTML form allows the user to send data (input parameters) to the server. Forms are created with the <form> tag, and can be submitted with either an HTTP GET or POST method.

- *HTTP is a protocol for contacting the server and thereby gaining access to all the resources on the server. Similarly, the TM technique is a protocol for contacting the Self and thereby gaining access to all the resources of pure consciousness.*

Text fields: <input>

```
<input type="text" name="username" size="10" maxlength="8" />
<input type="text" name="password" size="8" />
```

Property	Value(s)	Description
value	text	Initial text to appeal in text box
size	integer	Visible length of text box, in characters
maxlength	integer	Maximum number of chars that may be typed into text box
autocomplete	on, off	Whether to offer suggestions of text to auto-complete the field
autofocus	autofocus	Makes control initially receive keyboard focus
novalidate	novalidate	Indicates browser should not check value before submmitting
placeholder	text	A hint or example of what the user should type;
pattern	regular expr.	A regular expression indicating what input is valid
required	required	Whether browser should display an error if blank

Form controls: <input>

```
<input type="text" name="q" value="Colbert Report" />
<input type="submit" value="Booyah!" />
```

- `input` element is used to create many UI controls
  - an inline element that MUST be self-closed
- `name` attribute specifies name of query parameter to pass to server
- `type` can be `button`, `checkbox`, `file`, `hidden`, `password`, `radio`, `reset`, `submit`, `text`, ...
- `value` attribute specifies control's initial text

Checkboxes

- yes/no choices that can be checked and unchecked (**inline**)
  - none, 1, or many checkboxes can be checked at same time
  - Use the **`checked`** attribute in HTML to initially check the box

```
<input type="checkbox" name="lettuce" /> Lettuce
<input type="checkbox" name="tomato" checked /> Tomato
<input type="checkbox" name="pickles" checked /> Pickles
```

Radio buttons

- Sets of mutually exclusive choices (**inline**)
  - Grouped by **`name`** attribute (only one can be checked at a time)
  - Must specify a **`value`** for each one or else it will be sent as value **`on`**

```
<input type="radio" name="cc" value="visa" checked /> Visa
<input type="radio" name="cc" value="mastercard" /> MasterCard
<input type="radio" name="cc" value="amex" /> American Express
```

<textarea>

- The **<textarea>** tag defines a multi-line text input control. (inline)
- A textarea can hold an unlimited number of characters, and the text renders in a fixed-width font (usually Courier).
- The size of a textarea can be specified by the **cols** and **rows** attributes, or even better; through CSS' **height** and **width** properties.

```
<textarea rows="4" cols="20">
    Type your comments here.
</textarea>
```

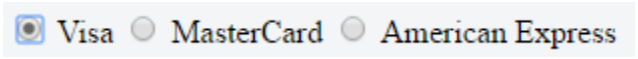
Type your comments here

See example: lecture4_examples/textarea.html

Text labels: `<label>`

- Associates nearby text with control, so you can **click text to activate control**
- Can be used with **checkboxes** or **radio** buttons
- **`label`** element can be targeted by CSS style rules

```
<label> <input type="radio" name="cc" value="visa"
checked="checked" /> Visa</label>
<label> <input type="radio" name="cc" value="mastercard" />
MasterCard</label>
<label> <input type="radio" name="cc" value="amex" /> American
Express</label>
```

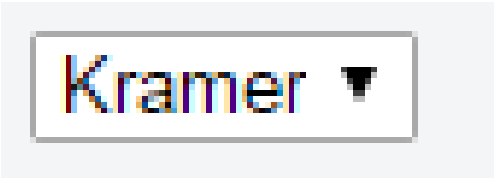


- See example: lecture4_examples/label1.html, lecture4_examples/label2.html

Drop-down list **<select>** and **<option>**

- Menus of choices that collapse and expand (inline)
  - **option** element represents each choice
  - **select** optional attributes: **disabled**, **multiple**, **size**
  - optional **selected** attribute sets which one is initially chosen

```
<select name="favoritecharacter">
  <option>Jerry</option>
  <option>George</option>
  <option selected>Kramer</option>
  <option>Elaine</option>
</select>
```



Reset and Submit buttons

- When we click **reset** button, it returns all form controls to their initial values
- When we click **submit** buttons, it sends all data with the specified **method** (Get/Post) to the **action** page in the form
- Specify custom text on the button by setting its **value** attribute

```
<input type="reset"  />
<input type="submit" />
```

Hidden input parameters

- An invisible parameter that is still passed to the server when form is submitted, it's useful for passing on additional state that isn't modified by the user

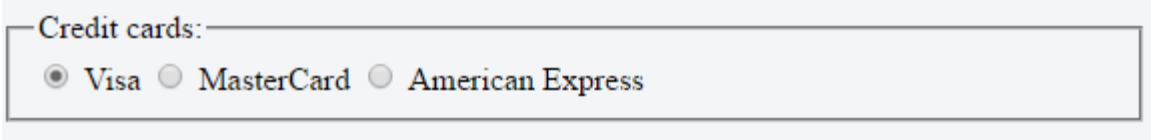
```
<input type="text" name="username" /> Name
<br />
<input type="text" name="sid" /> SID
<br />
<input type="hidden" name="school" value="MUM" />
<input type="hidden" name="year" value="2048" />
```

Name
SID

Grouping <fieldset>, <legend>

- Groups of input fields with optional caption (block)

```
<fieldset>
 <legend>Credit cards:</legend>
 <input type="radio" name="cc" value="visa" checked="checked" />
Visa
 <input type="radio" name="cc" value="mastercard" /> MasterCard
 <input type="radio" name="cc" value="amex" /> American Express
</fieldset>
```



New Form Controls in HTML5

Input type	Description
color	A color from a palette of available choices
range	A slider for selecting values in a given range
date	A date such as August 29, 2016
time	A time of day such as 11:15 PM
datetime	A date and time such as 11:15 PM, August 29, 2016
month	A month of a particular year, such as August, 2016
week	A week of a particular year, such as August 35, 2016

Styling forms – attribute selector

- Because most input element are created using input tag, we target each group of elements using this CSS selector:

```
element[attribute="value"] {
 property: value;
 property: value;
 ... property: value;
}
input[type="text"] {
 background-color: yellow;
 font-weight: bold;
}
```

Main Point

- HTML provides many different types of input widgets, including text fields, text areas, check boxes, radio buttons, and dropdown lists, this is also an area HTML 5 is expanding to make form filling more efficient and effortless.

- *Nature supports the growth of things that are efficient. Do less and accomplish more.*

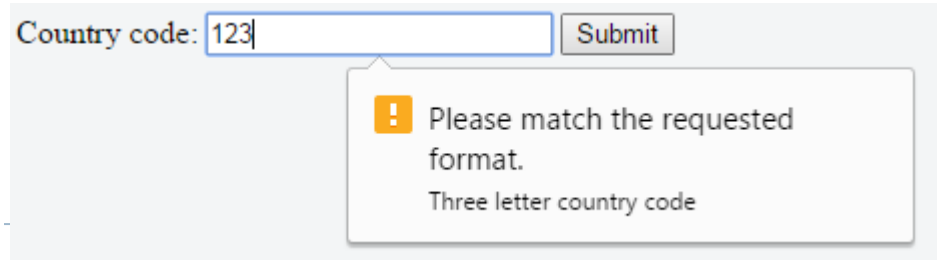
pattern

The **pattern** attribute specifies a regular expression that the **<input>** element's value is checked against. The **pattern** uses the ECMAScript (i.e. Javascript) flavor of regex.

Note: The **pattern** attribute works with the following input types: **text**, **date**, **search**, **url**, **tel**, **email**, and **password**.

Tip: Use the global **title** attribute to describe the pattern to help the user.

```
<form action="demo_form.jsp">
 Country code:
 <input type="text" name="country_code" pattern="[A-Za-z]{3}" title=" Three letter country code ">
 <input type="submit">
</form>
```



Regular expressions

```
^[a-zA-Z_\-]+@(([a-zA-Z_\-])+\.)+[a-zA-Z]{2,4}$
```

- Regular expression ("regex"): a description of a pattern of text
- Can test whether a string matches the expression's pattern
- Regular expressions are extremely powerful but tough to read
  - (the above regular expression matches email addresses)
- Regular expressions are used in all languages:
  - Java, PHP ,JavaScript, HTML, C#, and other languages
- Many IDEs allow regexes in search/replace

Basic regular expressions

The simplest regexes simply matches any string that contains that text.

```
abc
```

The above regular expression matches any string containing "abc":

- YES: "abc", "abcdef", "defabc", ".=.abc.=.", ...
- NO: " ABC" , " fedcba", "ab c", "PHP", ...

- Note that html5 has implicit anchors ^ and $, so abc is really ^abc$
- Regular expressions are case-sensitive by default.

Wildcards

A dot `.` matches exactly **one-character** except a `\n` line break

`.oo.y` matches "Doocy", "goofy", "LooNy", ...

Special characters: |, (), \

| means OR

abc|def|g matches "abc", "def", or "g"

There's no AND symbol. Why not?

() are for grouping

(Homer|Marge) Simpson

matches "Homer Simpson" or "Marge Simpson"

**** starts an escape sequence

many characters must be escaped to match them literally: / \ $. [ ] ( ) ^ * + ?

<br \/> matches lines containing
 tags

Quantifiers: *, +, ?

`*` means 0 or more occurrences

- **`abc*`** matches "ab", "abc", "abcc", "abccc", ...
- **`a(bc)*`** matches "a", "abc", "abcbc", "abcbcbc", ...
- **`a.*a`** matches "aa", "aba", "a8qa", "a!?xyz__9a", ...

`+` means 1 or more occurrences

- **`a(bc)+`** matches "abc", "abcbc", "abcbcbc", ...
- **`Goo+gle`** matches "Google", "Gooogle", "Goooogle", ...

`?` means 0 or 1 occurrences

- **`a(bc)?`** matches "a" or "abc"

More quantifiers: {min,max}

`{min,max}` means between min and max occurrences (inclusive)

- `a(bc){2,4}` matches "abcbc", "abcbcbc", or "abcbcbcbc"

`min` or `max` may be omitted to specify any number

- `{2,}` means 2 or more
- `{,6}` means up to 6
- `{3}` means exactly 3

Anchors: ^ and $

`^` represents the beginning of the string or line;

`$` represents the end

`Jess` matches all strings that contain Jess;

`^Jess` matches all strings that start with Jess;

`Jess$` matches all strings that end with Jess;

`^Jess$` matches the exact string "Jess" only

`^Mart.*Stepp$` matches "MartStepp", "Marty Stepp", "Martin D Stepp", ... but NOT "Marty Stepp stinks" or "I H8 Martin Stepp"

The html5 spec states that ^ and $ are implicit

Character sets: []

`[]` group characters into a character set, will match any **single character** from the set

`[bcd]art` matches strings containing "bart", "cart", and "dart" equivalent to `(b|c|d)art` but shorter

inside [], many of the modifier keys act as normal characters

`what[!*?]*` matches "what", "what!", "what?**!", "what??!", ...

What regular expression matches DNA?

DNA strings are constructed from the alphabet {A, C, G, T}.As an example, "AAGATGCCGT" is a DNA string.

`[ACGT]+`

Character ranges: [start-end]

inside a character set, specify a range of characters with -

`[a-z]` matches any lowercase letter

`[a-zA-Z0-9]` matches any lower- or uppercase letter or digit

an initial `^` inside a character set negates it

`[^abcd]` matches any character other than a, b, c, or d

inside a character set, - must be escaped to be matched

`[+\-]?[0-9]+` matches an optional + or -, followed by at least one digit

What regular expression matches letter grades such as A, B+, or D- ?

`[ABCDF][+\-]?`

Escape sequences

Special escape sequence character sets:

- `\d` matches any digit (same as [0-9])
- `\D` any non-digit ([^0-9])
- `\w` matches any word character (same as [a-zA-Z_0-9])
- `\W` any non-word char
- `\s` matches any whitespace character (, \t, \n, etc.)
- `\S` any non-whitespace

What regular expression matches dollar amounts of at least $100.00 ?

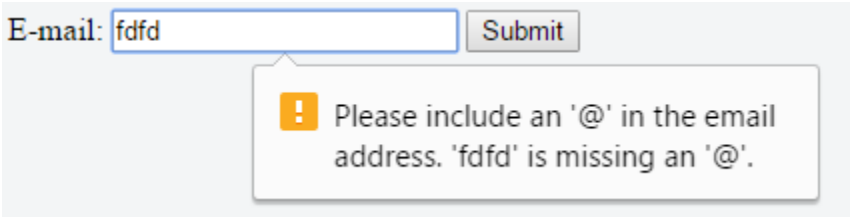
```
\$[1-9]\d{2,}\.\d{2}
```

Example - email

- An <input> element with type="email" that must be in the following order: characters@characters.domain

  (characters followed by an @ sign, followed by more characters, and then a ".")

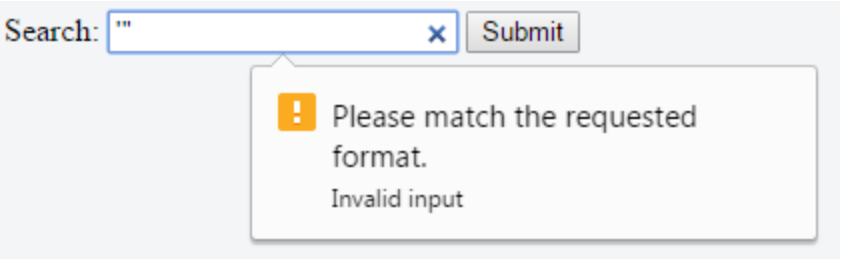
```
<form action="demo_form.jsp">
 E-mail:
 <input type="email" name="email" pattern="[a-z0-9._+\-]+@[a-z0-9.\-]+\.[a-z]{2,3}">
 <input type="submit">
</form>
```



Example - Search

- An <input> element with type="search" that CANNOT contain the following characters: ' or “

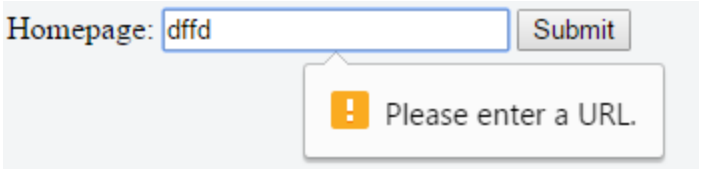
```
<form action="demo_form.jsp">
 Search: <!-- x27 is a single quote and \x22 is a double quote -->
 <input type="search" name="search" pattern="[^\x27\x22]+" title="Invalid input">
 <input type="submit">
</form>
```



Example - URL

- An <input> element with type="url" that must start with http:// or https:// followed by at least one character:

```
<form action="demo_form.jsp">
 Homepage:
 <input type="url" name="website"
pattern="https?://.+" title="Include http://">
 <input type="submit">
</form>
```



CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

Forms and Regular Expressions

1. It is a best practice to validate all data
2. The easiest way to write validation logic is with regular expressions

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3. **Transcendental consciousness** is the ultimate in robustness and simplicity, as it is the unchanging silence at the basis of creation.
4. **Impulses within the Transcendental field:** all actions are achieved by the interplay of unity, by understanding the principles by which unity becomes diversity we can gain complete understanding of the relative.
5. **Wholeness moving within itself:** In Unity Consciousness, one experiences that both the unchanging silence of the absolute and the never ending diversity of the relative are the Self.