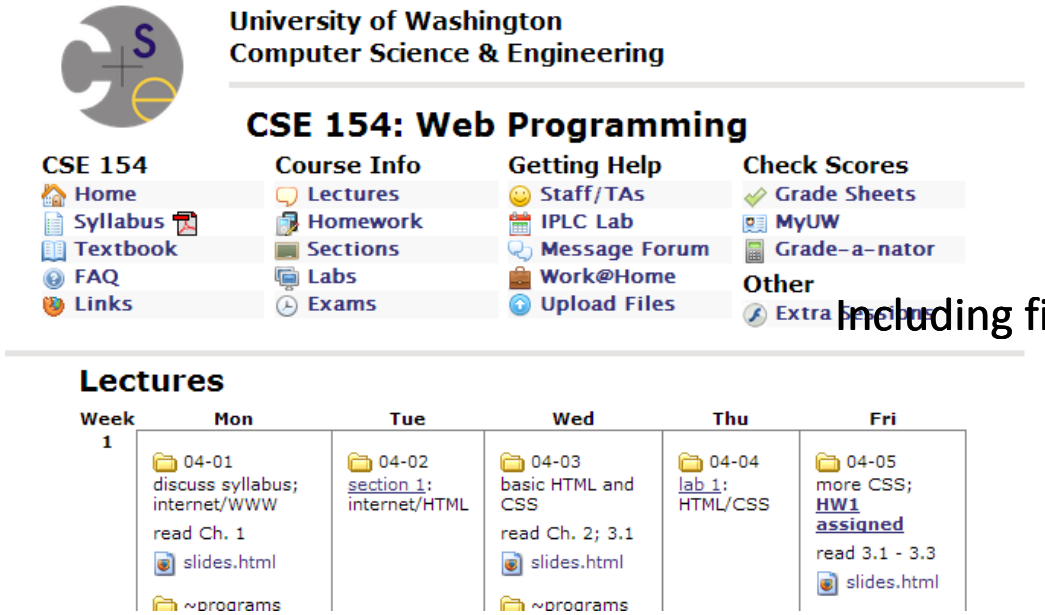
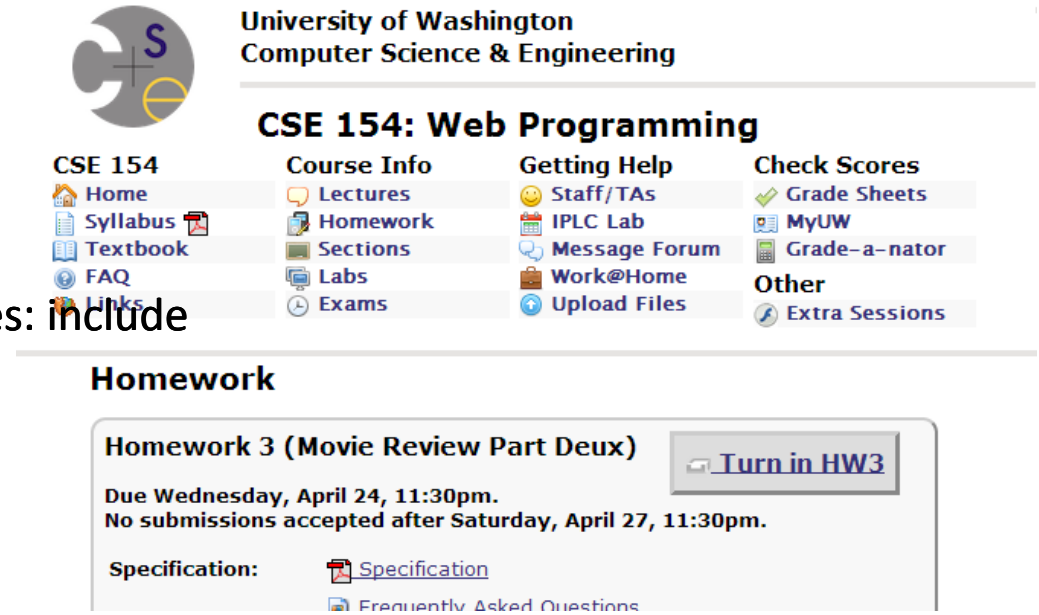
CSE 154

LECTURE 10: UPLOADING FILES

Common site HTML/code



Including files: include



- How can we avoid redundantly repeating this content or code?

Including files: include

```
include("filename");
```
PHP

```
include("header.html");
include("shared-code.php");
```
PHP

- inserts the entire contents of the given file into the PHP script's output page
- encourages modularity
- useful for defining reused functions needed by multiple pages
- related: include_once, require, require_once

Including a common HTML file

```
<!DOCTYPE html>
<!-- this is top.html -->
<html><head><title>This is some common code</title>
...
```
HTML

```
include("top.html");     # this PHP file re-uses top.html's HTML content
```

- Including a .html file injects that HTML output into your PHP page at that point
- useful if you have shared regions of pure HTML tags that don't contain any PHP content

Including a common PHP file

```php
<?php
# this is common.php
function useful($x) { return $x * $x; }

function top() {
  ?>
  <!DOCTYPE html>
  <html><head><title>This is some common code</title>
  ...
  <?php
}
```

PHP

```php
include("common.php");    # this PHP file re-uses common.php's PHP code
$y = useful(42);          # call a shared function
top();                    # produce HTML output
...
```

- including a .php file injects that PHP code into your PHP file at that point
- if the included PHP file contains functions, you can call them

A form that submits to itself

```HTML
<form action="" method="post">
  ...
</form>
```

- a form can submit its data back to itself by setting the action to be blank (or to the page's own URL)
- benefits
  - fewer pages/files (don't need a separate file for the code to process the form data)
  - can more easily re-display the form if there are any errors

Processing a self-submitted form

```php
if ($_SERVER["REQUEST_METHOD"] == "GET") {
  # normal GET request; display self-submitting form
  ?>
  <form action="" method="post">...</form>
  <?php
} elseif ($_SERVER["REQUEST_METHOD"] == "POST") {
  # POST request; user is submitting form back to here; process it
  $var1 = $_POST["param1"];
  ...
}
```

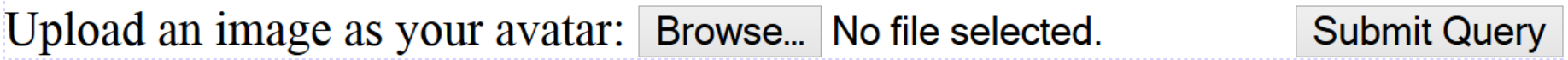
PHP

- a page with a self-submitting form can process both GET and POST requests
- look at the global $_SERVER array to see which request you're handling
- handle a GET by showing the form; handle a POST by processing the submitted form data

Uploading files

```
<form action="http://webster.cs.washington.edu/params.php"
      method="post" enctype="multipart/form-data">
  Upload an image as your avatar:
  <input type="file" name="avatar" />
  <input type="submit" />
</form>
```

HTML



output

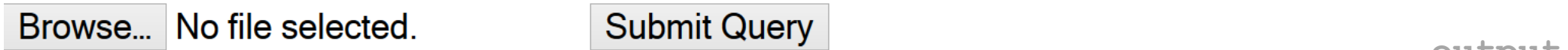
- add a file upload to your form as an input tag with type of file
- must also set the enctype attribute of the form

Processing an uploaded file in PHP

- uploaded files are placed into global array $_FILES, not $_POST
- each element of $_FILES is itself an associative array, containing:
  - name : the local filename that the user uploaded
  - type : the MIME type of data that was uploaded, such as image/jpeg
  - size : file's size in bytes
  - tmp_name : a filename where PHP has temporarily saved the uploaded file
    - to permanently store the file, move it from this location into some other file

Uploading details

```
<input type="file" name="avatar" />
```
HTML



output

- example: if you upload borat.jpg as a parameter named avatar,
  - $_FILES["avatar"]["name"] will be "borat.jpg"
  - $_FILES["avatar"]["type"] will be "image/jpeg"
  - $_FILES["avatar"]["tmp_name"] will be something like "/var/tmp/phpZtR4TI"

Processing uploaded file, example

```php
$username = $_POST["username"];
if (is_uploaded_file($_FILES["avatar"]["tmp_name"])) {
    move_uploaded_file($_FILES["avatar"]["tmp_name"],
    "$username/avatar.jpg");
  print "Saved uploaded file as $username/avatar.jpg\n";
} else {
  print "Error: required file not uploaded";
}
```

PHP

- functions for dealing with uploaded files:
  - is_uploaded_file(filename)
  - returns TRUE if the given filename was uploaded by the user
  - move_uploaded_file(from, to)
  - moves from a temporary file location to a more permanent file
- proper idiom: check is_uploaded_file, then do move_uploaded_file

Creating an associative array

```
$name = array();
$name["key"] = value;
...
$name["key"] = value;
```
PHP

```
$name = array(key => value, ..., key => value);
```
PHP

```
$blackbook = array("allison"  => "206-685-2181",
                   "stuart" => "206-685-9138",
                   "linda"  => "206-867-5309");
```
PHP

- can be declared either initially empty, or with a set of predeclared key/value pairs

Printing an associative array

```php
print_r($blackbook);
```
PHP

```
Array
(
    [jenny] => 206-867-5309
    [stuart] => 206-685-9138
    [marty] => 206-685-2181
)
```
output

- print_r function displays all keys/values in the array
- var_dump function is much like print_r but prints more info
- unlike print, these functions require parentheses

Associative array functions

```php
if (isset($blackbook[“allison"])) {
  print “Allison's phone number is {$blackbook['allison']}\n";
} else {
  print "No phone number found for Allison Obourn.\n";
}
```

name(s)	category
isset, array_key_exists	whether the array contains value for given key
array_keys, array_values	an array containing all keys or all values in the assoc.array
asort, arsort	sorts by value, in normal or reverse order
ksort, krsort	sorts by key, in normal or reverse order

foreach loop and associative arrays

```php
foreach ($blackbook as $key => $value) {
  print "$key's phone number is $value\n";
}
```

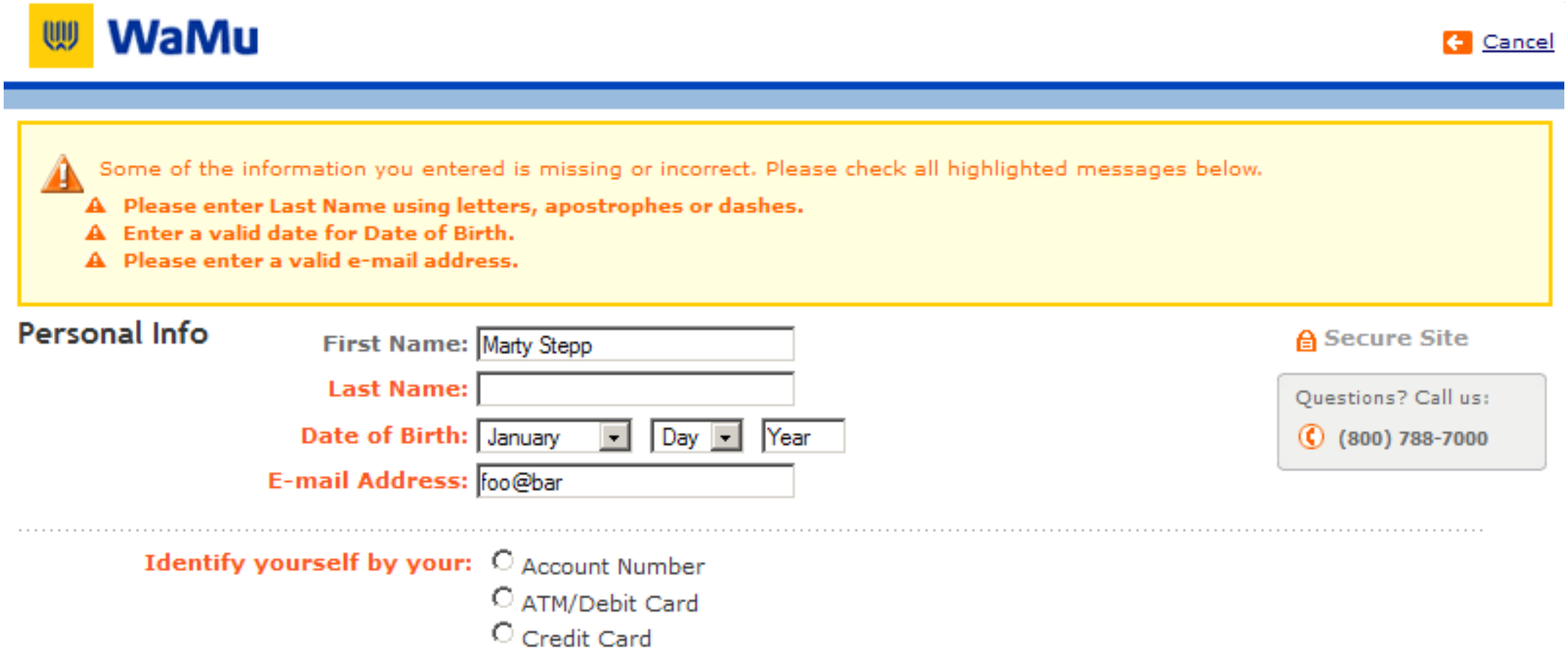
```
allison's phone number is 206-867-5309
stuart's phone number is 206-685-9138
zack's phone number is 206-685-2181
```

- both the key and the value are given a variable name
- the elements will be processed in the order they were added to the array

What is form validation?

- **validation**: ensuring that form's values are correct
- some types of validation:
  - preventing blank values (email address)
  - ensuring the type of values
    - integer, real number, currency, phone number, Social Security number, postal address, email address, date, credit card number, ...
  - ensuring the format and range of values (ZIP code must be a 5-digit integer)
  - ensuring that values fit together (user types email twice, and the two must match)

A real form that uses validation



Client vs. server-side validation

- Validation can be performed:
- **client-side** (before the form is submitted)
  - can lead to a better user experience, but not secure (why not?)
- **server-side** (in PHP code, after the form is submitted)
  - needed for truly secure validation, but slower
- both
  - best mix of convenience and security, but requires most effort to program

An example form to be validated

```
<form action="http://foo.com/foo.php" method="get">
  <div>
    City:  <input name="city" /> <br />
    State: <input name="state" size="2" maxlength="2" /> <br />
    ZIP:   <input name="zip" size="5" maxlength="5" /> <br />
    <input type="submit" />
  </div>
</form>
```

HTML

output

- Let's validate this form's data on the server...

Basic server-side validation code

```php
$city  = $_POST["city"];
$state = $_POST["state"];
$zip   = $_POST["zip"];
if (!$city || strlen($state) != 2 || strlen($zip) != 5) {
  print "Error, invalid city/state/zip submitted.";
}
```

PHP

- basic idea: Examine parameter values, and if they are bad, show an error message and abort.

- What should we do if the data submitted is missing or invalid?
  - simply printing an error message is not a very graceful result

The die function

```php
die("error message text");
```

- PHP's die function prints a message and then completely stops code execution
- it is sometimes useful to have your page "die" on invalid input
- problem: poor user experience (a partial, invalid page is sent back)

The header function

```
header("HTTP header text");    # in general
header("Location: url");       # for browser redirection      PHP
```

- PHP's header function can be used for several common HTTP messages
  - sending back HTTP error codes (404 not found, 403 forbidden, etc.)
  - redirecting from one page to another
  - indicating content types, languages, caching policies, server info, ...
- you can use a Location header to tell the browser to redirect itself to another page
  - useful to redirect if the user makes a validation error
  - **must** appear before any other HTML output generated by the script

Using header to redirect between pages

```php
header("Location: url");
```

```php
$city  = $_POST["city"];
$state = $_POST["state"];
$zip   = $_POST["zip"];
if (!$city || strlen($state) != 2 || strlen($zip) != 5) {
  header("Location: start-page.php");   # invalid input; redirect
}
```

- *one problem*: User is redirected back to original form without any clear error message or understanding of why the redirect occurred. (We can improve this later.)

Another problem: Users submitting HTML content

- A user might submit information to a form that contains HTML syntax
- If we're not careful, this HTML will be inserted into our pages (why is this bad?)

The htmlspecialchars function

htmlspecialchars	returns an HTML-escaped version of a string

- text from files / user input / query params might contain <, >, &, etc.
- we could manually write code to strip out these characters
- better idea: allow them, but escape them

```
$text = "<p>hi 2 u & me</p>";
$text = htmlspecialchars($text);   # "&lt;p&gt;hi 2 u &amp; me&lt;/p&gt;"
```