COP 4610L: Applications in the Enterprise
Fall 2007

Introduction to PHP – Part 1

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Introduction to PHP

- PHP is officially known as PHP: Hypertext Preprocessor and is very rapidly becoming the most popular server-side scripting language for creating dynamic web pages.
- PHP was created in 1994 by Rasmus Lerdorf (who currently works for Linuxcare, Inc. as a senior open-source researcher) to track users at his Web site. Lerdorf originally called it Personal Home Page Tools in a package he released in 1995. It eventually became an Apache Software Foundation project.
- PHP2 featured built-in database support and form handling. In 1997, PHP3 was released and featured a new parser which substantially increased performance and led to an explosion in PHP use.

Introduction to PHP (cont.)

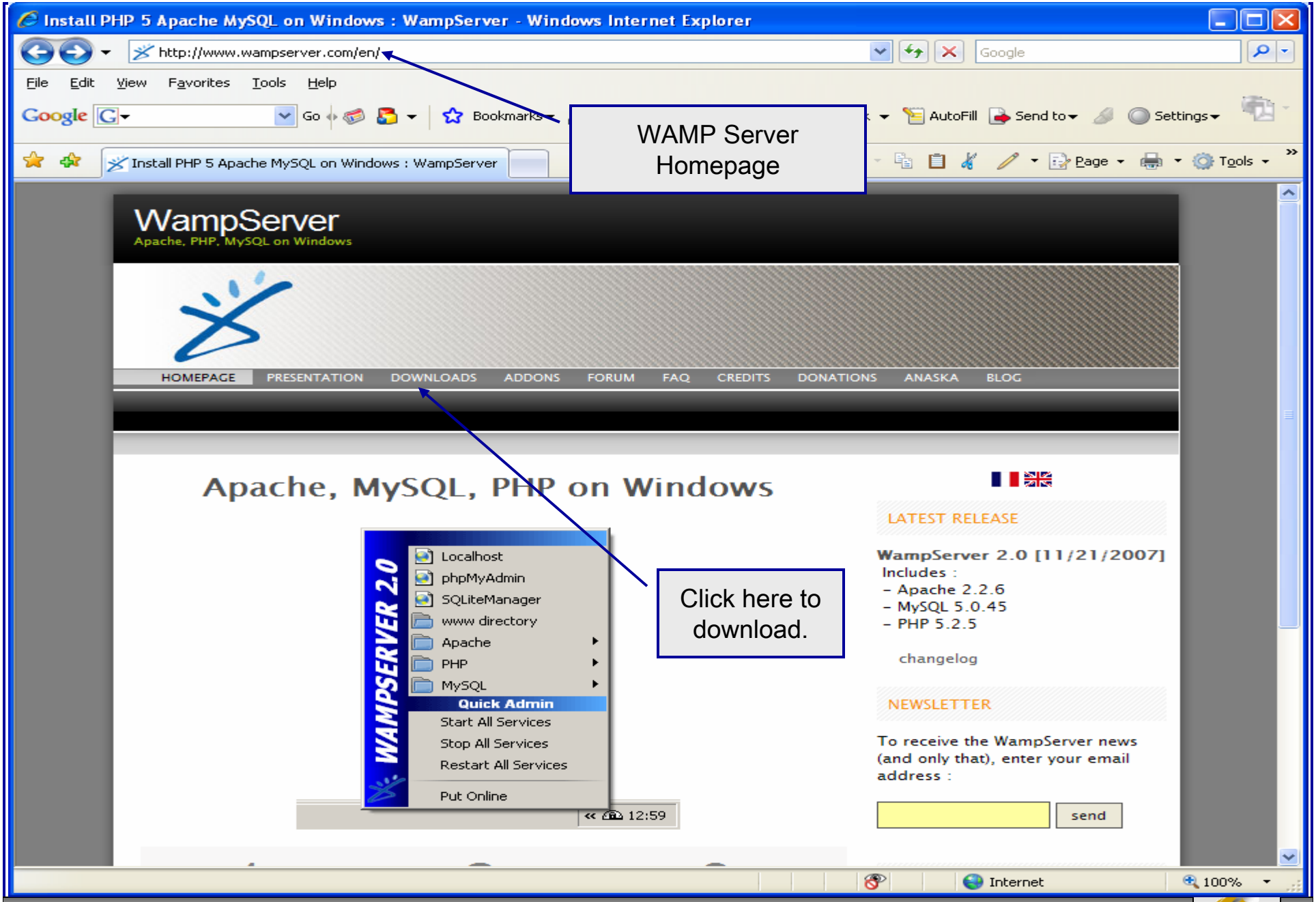
- PHP4 featured the Zend Engine and was considerably faster and more powerful than its predecessors and further enhanced the popularity of PHP.
- The current release is PHP 5.2.5 and features the Zend Engine 2, which provides further increases in speed and functionality. You can download the latest version of PHP at www.php.net. For more details on the Zend Engine 2 see www.zend.com.
- Today more than 17 million domains utilize PHP technology.
- All of the examples we'll be looking at use the latest stable version of PHP which is 5.2.5 and was released November 8, 2007.

Introduction to PHP (cont.)

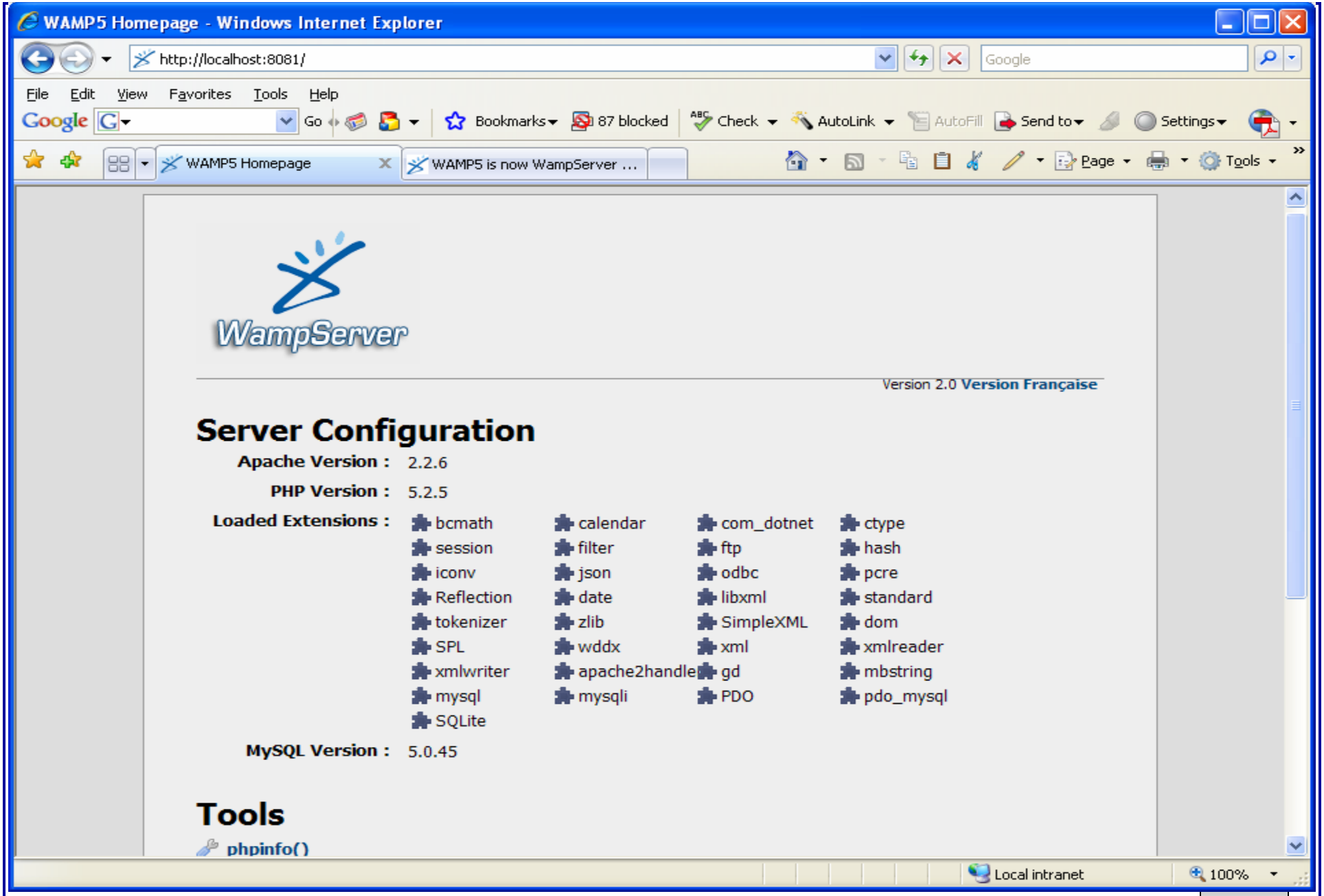
- The power of the Web resides not only in serving content to users, but also in responding to requests from users and generating Web pages with dynamic content.
- Interactivity between the user and the server has become a crucial part of Web functionality. While other languages can also perform these functions, PHP was written specifically for interacting with the Web.
- PHP code is embedded directly into XHTML documents. This allows the document author to write XHTML in a clear, concise manner, without having to use multiple `print` statements, as is necessary with other CGI-based languages.

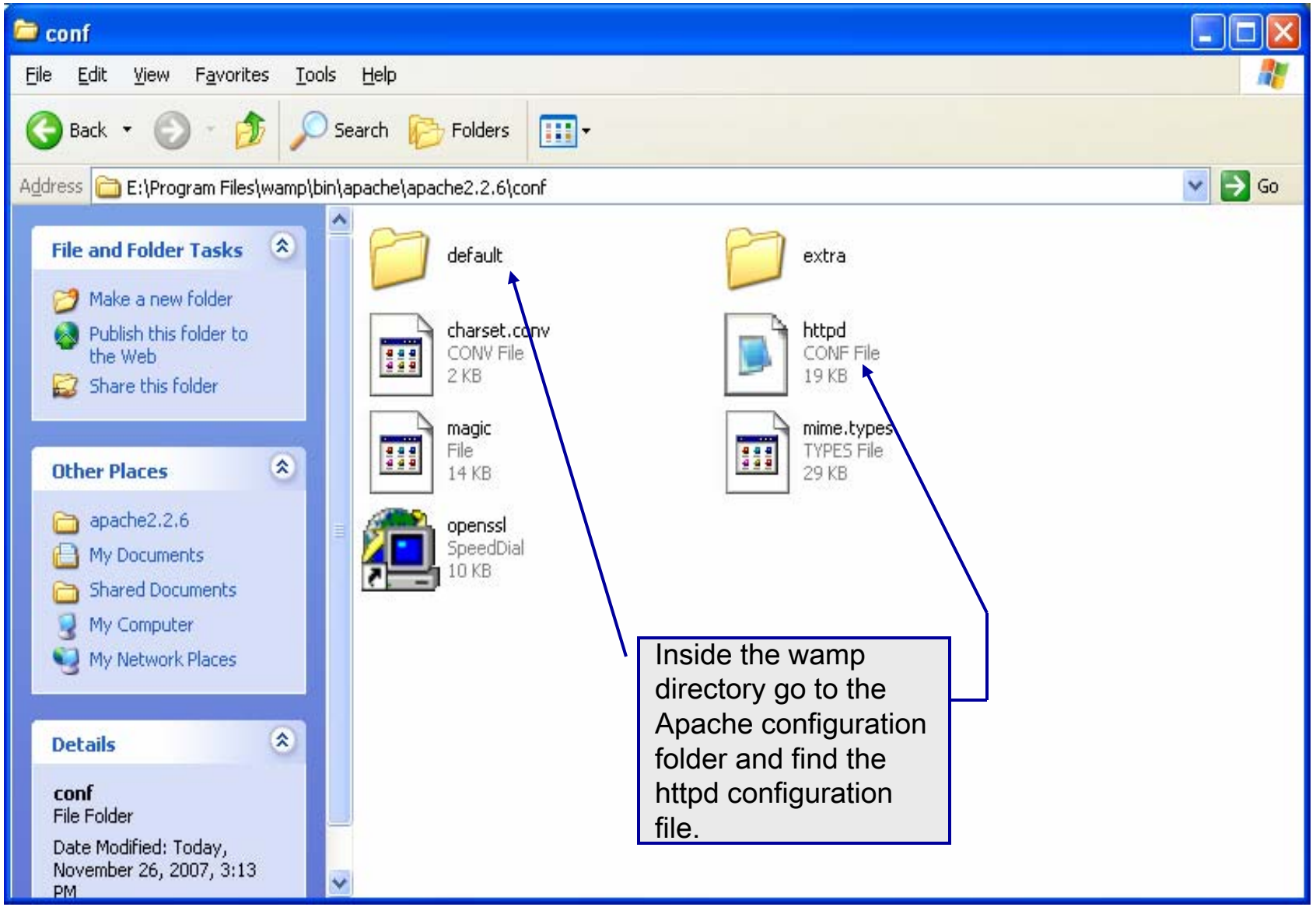
Introduction to PHP (cont.)

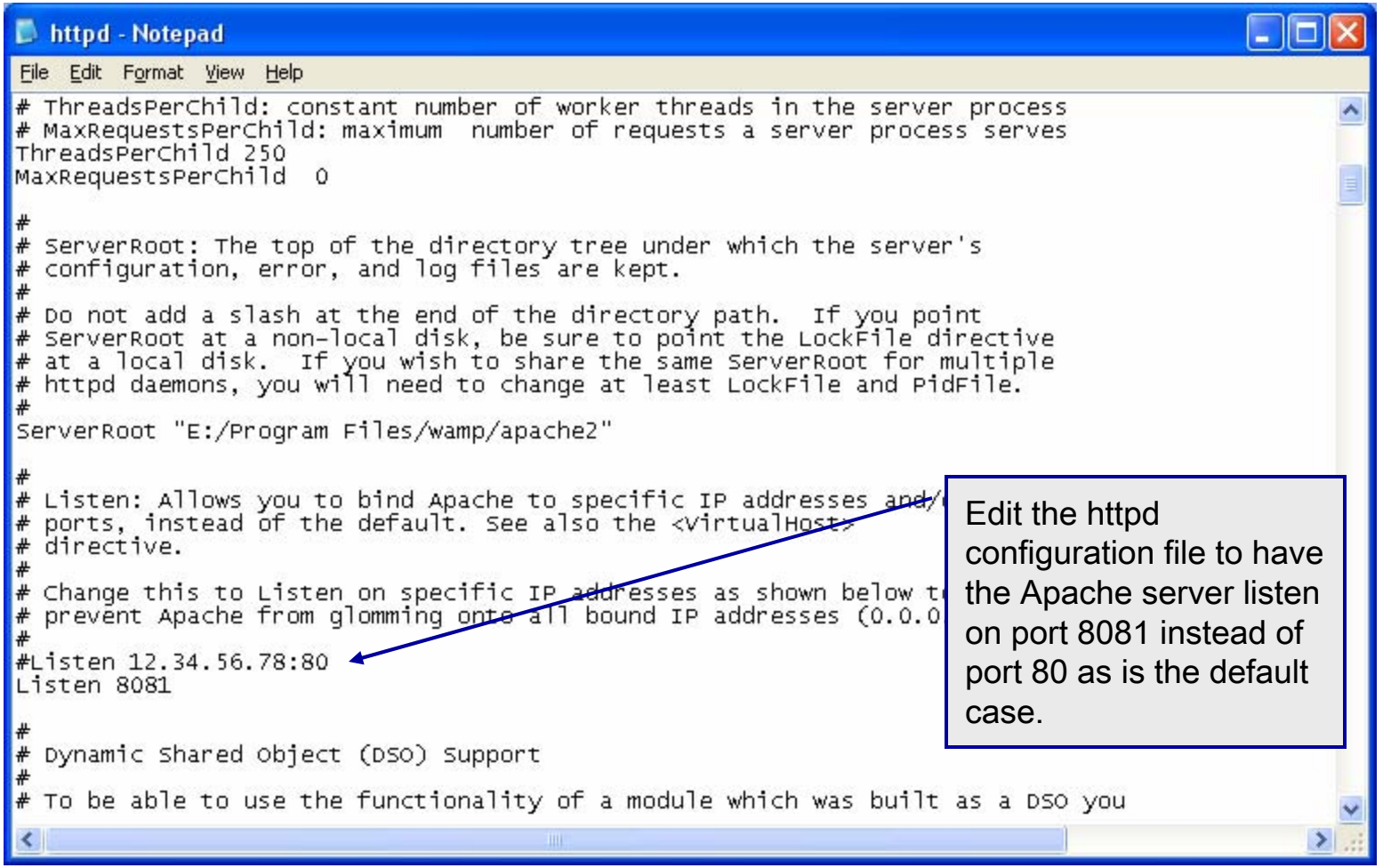
- PHP script file names usually end with `.php`, although a server can be configured to handle other file extensions.
- To run a PHP script, PHP must first be installed on your system. Download PHP 5.2.5 from www.php.net. (Most recent version is 5.2.5.)
- Although PHP can be used from the command line, a Web server is required to take full advantage of the scripting language. I would suggest the Apache server available from www.apache.org. (Note: this is not the Tomcat server you've already used.) Current version is 2.2.6 which is a new major version change from the previous 2.0.xx versions (mostly in the areas of security).
- The easiest way to get this setup is to use WAMP Server. The current version of this is WAMP 2.0 which automatically loads and configures Apache 2.2.6, MySQL 5.0.45 and PHP 5.2.5. This is how I'll show you to get it set-up. Go to www.wampserver.com.


Install PHP 5 Apache MySQL on Windows : WampServer - Windows Internet Explorer
http://www.wampserver.com/en/
WAMP Server Homepage
WampServer
Apache, PHP, MySQL on Windows
HOMEPAGE
PRESENTATION
DOWNLOADS
ADDONS
FORUM
FAQ
CREDITS
DONATIONS
ANASKA
BLOG
Apache, MySQL, PHP on Windows
Click here to download.
WAMPSERVER 2.0
Localhost
phpMyAdmin
SQLiteManager
www directory
Apache
PHP
MySQL
Quick Admin
Start All Services
Stop All Services
Restart All Services
Put Online
12:59
LATEST RELEASE
WampServer 2.0 [11/21/2007]
Includes :
- Apache 2.2.6
- MySQL 5.0.45
- PHP 5.2.5
changelog
NEWSLETTER
To receive the WampServer news (and only that), enter your email address :
send
Internet
100%


Download WampServer 2 - Download PHP, apache, MySQL - Windows Internet Explorer
http://www.wampserver.com/en/download.php
File Edit View Favorites Tools Help
Download WampServer 2 - Download PHP, apache, M...
WampServer
Apache, PHP, MySQL on Windows
Download page
HOMEPAGE PRESENTATION DOWNLOADS ADDONS FORUM FAQ CREDITS DONATIONS ANASKA BLOG
Downloads
WampServer is an open source project, free to use (GPL licence). If you think our work deserves it and you want to help us, you can make a donation with paypal.
WARNING : do not try to install WampServer 2 over WAMP5.
If WAMP5 is installed on your computer, save your data, uninstall it and delete the WAMP5 directory before installing WampServer 2.
DOWNLOAD
WampServer 2.0
(November 21 2007)
Apache 2.2.6
PHP 5.2.5 + PECL
SQLitemanager
MySQL 5.0.45
LATEST RELEASE
WampServer 2.0 [11/21/2007]
Includes :
- Apache 2.2.6
- MySQL 5.0.45
- PHP 5.2.5
changelog
NEWSLETTER
To receive the WampServer news (and only that), enter your email address :
send
http://www.wampserver.com/dl.php
Internet
100%


WAMP5 Homepage - Windows Internet Explorer
http://localhost:8081/
Google
File Edit View Favorites Tools Help
Bookmarks 87 blocked Check AutoLink AutoFill Send to Settings
WAMP5 Homepage
WAMP5 is now WampServer ...
Page Tools
WampServer
Version 2.0 Version Française
Server Configuration
Apache Version : 2.2.6
PHP Version : 5.2.5
Loaded Extensions :
bcmath calendar com_dotnet ctype
session filter ftp hash
iconv json odbc pcre
Reflection date libxml standard
tokenizer zlib SimpleXML dom
SPL wddx xml xmlreader
xmlwriter apache2handler gd mbstring
mysql mysqli PDO pdo_mysql
SQLite
MySQL Version : 5.0.45
Tools
phpinfo()
Local intranet
100%


conf
File Edit View Favorites Tools Help
Back Search Folders
Address E:\Program Files\wamp\bin\apache\apache2.2.6\conf
Go
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
apache2.2.6
My Documents
Shared Documents
My Computer
My Network Places
Details
conf
File Folder
Date Modified: Today, November 26, 2007, 3:13 PM
default
extra
charset.conv
CONV File
2 KB
httpd
CONF File
19 KB
magic
File
14 KB
mime.types
TYPES File
29 KB
openssl
SpeedDial
10 KB
Inside the wamp directory go to the Apache configuration folder and find the httpd configuration file.

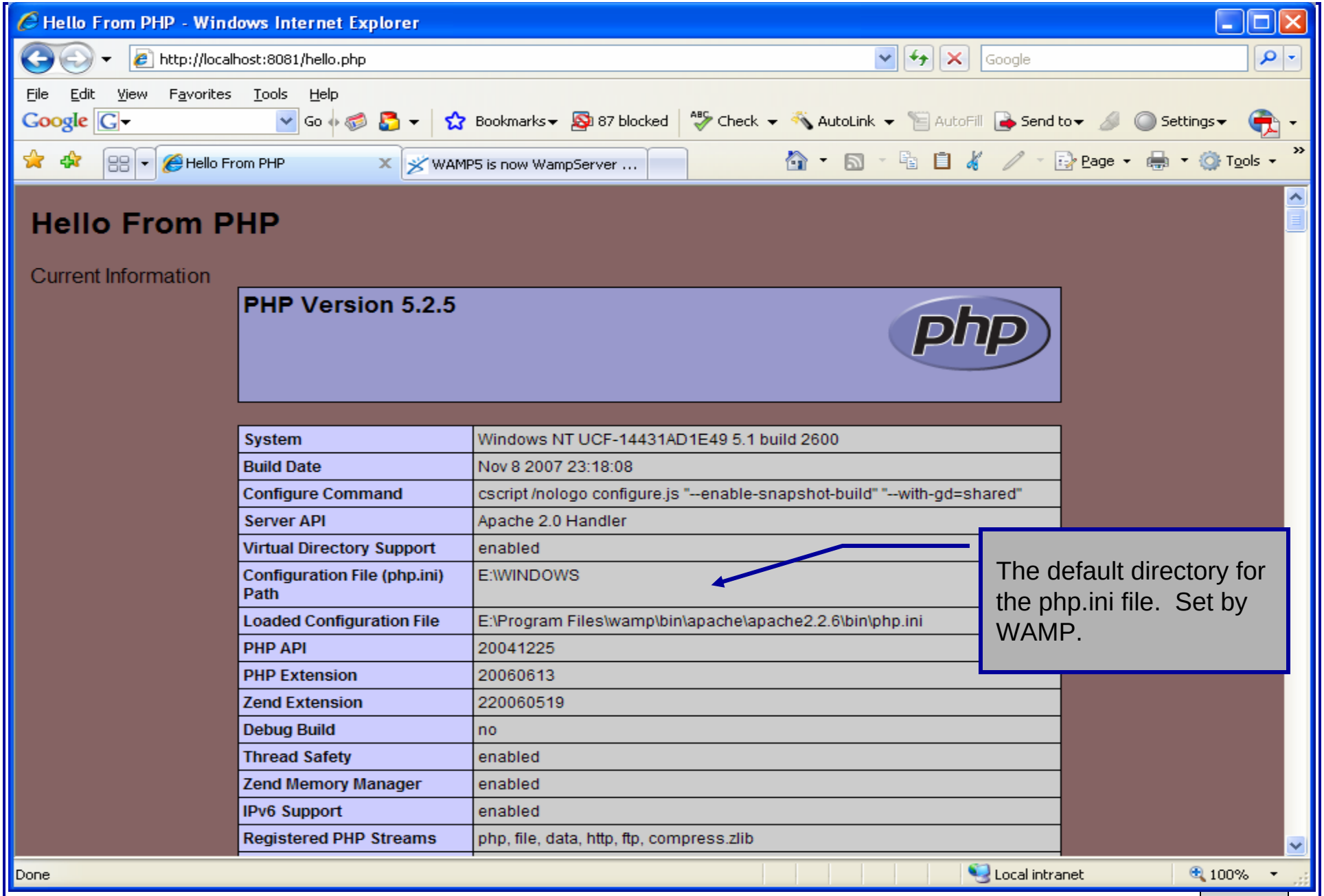

httpd - Notepad
File Edit Format View Help
ThreadsPerChild: constant number of worker threads in the server process
MaxRequestsPerChild: maximum number of requests a server process serves
ThreadsPerChild 250
MaxRequestsPerChild 0
#
ServerRoot: The top of the directory tree under which the server's
configuration, error, and log files are kept.
#
Do not add a slash at the end of the directory path. If you point
ServerRoot at a non-local disk, be sure to point the LockFile directive
at a local disk. If you wish to share the same ServerRoot for multiple
httpd daemons, you will need to change at least LockFile and PidFile.
#
ServerRoot "E:/Program Files/wamp/apache2"
#
Listen: Allows you to bind Apache to specific IP addresses and/
ports, instead of the default. See also the <VirtualHost>
directive.
#
Change this to Listen on specific IP addresses as shown below t
prevent Apache from glomming onto all bound IP addresses (0.0.0
#
#Listen 12.34.56.78:80
Listen 8081
#
Dynamic Shared Object (DSO) Support
#
To be able to use the functionality of a module which was built as a DSO you
Edit the httpd configuration file to have the Apache server listen on port 8081 instead of port 80 as is the default case.

A PHP Test Example

```
<html>
<head>
<title>Hello From PHP</title>
</head>
<body  style = "font-family: arial, sans-serif;
     background-color: #856363"  background=image1.jpg>
<h1> Hello From PHP</h1>

<?php
  print "Current Information";
  phpInfo();
?>

</body>
</html>
```

This is PHP

Create this file named `hello.php` and save it to the `htdocs` folder in Apache. Then start the Apache server, enter the URL: http://localhost:8081/hello.php and you should see output similar to that shown on the next slide.


Hello From PHP - Windows Internet Explorer
http://localhost:8081/hello.php
Hello From PHP
Current Information
PHP Version 5.2.5
System | Windows NT UCF-14431AD1E49 5.1 build 2600
Build Date | Nov 8 2007 23:18:08
Configure Command | cscript /nologo configure.js "--enable-snapshot-build" "--with-gd=shared"
Server API | Apache 2.0 Handler
Virtual Directory Support | enabled
Configuration File (php.ini) Path | E:\WINDOWS
Loaded Configuration File | E:\Program Files\wamp\bin\apache\apache2.2.6\bin\php.ini
PHP API | 20041225
PHP Extension | 20060613
Zend Extension | 220060519
Debug Build | no
Thread Safety | enabled
Zend Memory Manager | enabled
IPv6 Support | enabled
Registered PHP Streams | php, file, data, http, ftp, compress.zlib
The default directory for the php.ini file. Set by WAMP.
Done
Local intranet
100%

A First PHP Example

- The following two pages illustrate a simple PHP "hello world" program.
- In PHP, code is inserted between the scripting delimiters **<?php** and **?>**. PHP code can be placed anywhere in XHTML markup, as long as the code is enclosed in these scripting delimiters.
- Place all of your XHTML and PHP files inside the WAMP www directory.

welcome.php Example

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<!-- welcome.php -->
<!-- XHTML file containing a PHP script. -->

<?php
    $name = "Mark";   //php declaration and assignment
?>

<html xmlns = "http://www.w3.org/1999/xhtml">

   <!-- head section of document -->
   <head>
      <title>A Simple PHP Document</title>
   </head>

   <!-- body section of document -->
   <body style = "font-size: 2em">
    <hr>
    <font color = blue><h1> Generating HTML From PHP </h1></font color>
     <p>
```

PHP code declaring a variable.

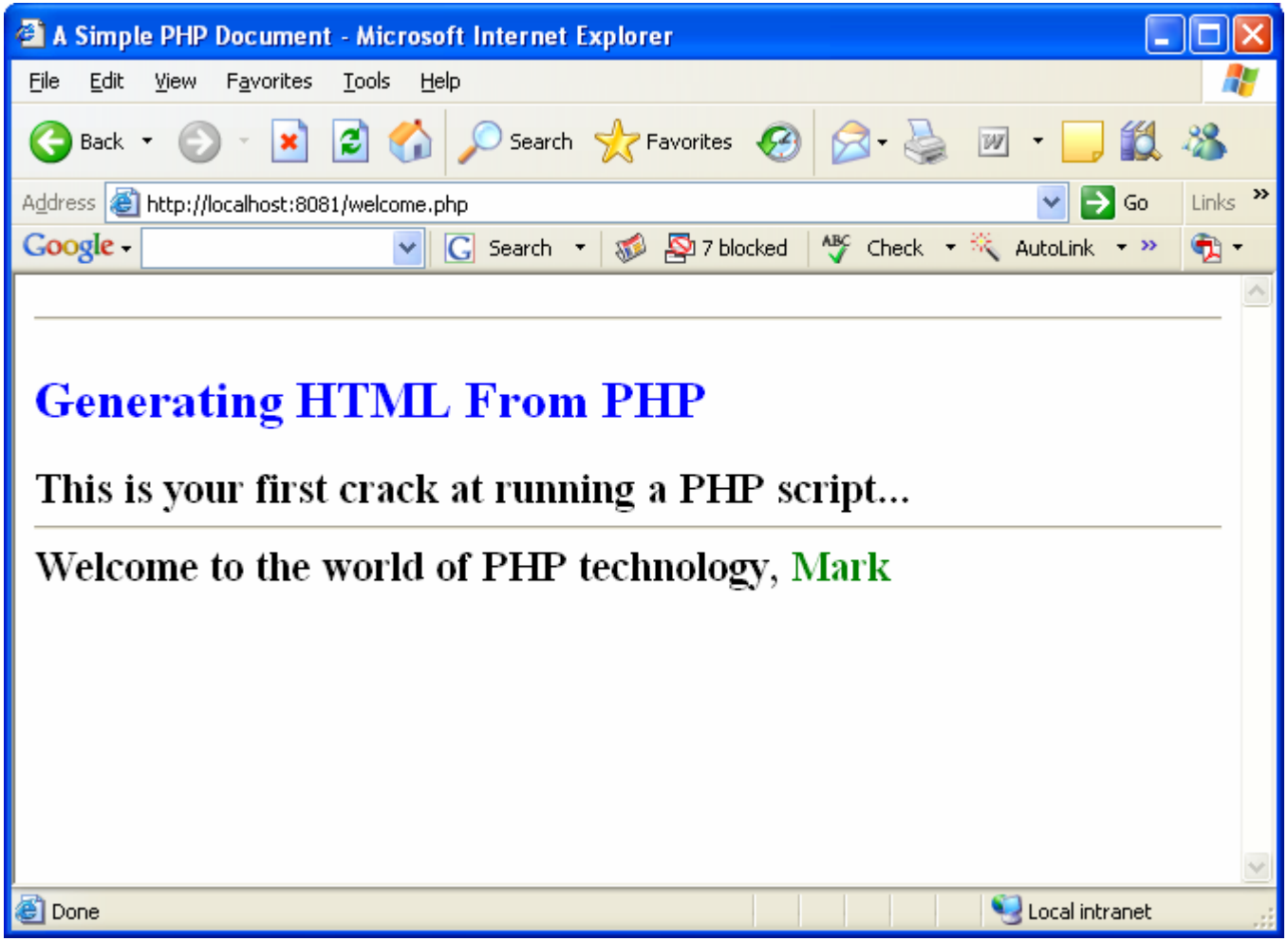
welcome.php Example

```
        <strong>
          <!---print variable name's value in the message-->
            <?php
                print("This is your first crack at running a PHP script...");
                print("<HR>");
                print("Welcome to the world of PHP technology, ");
            ?>
                <font color = green>
                <?php
                        print("$name");
                ?>
                </font color>
          </strong>
        </p>
    </body>
</html> <!-- end XHTML document -->
```

PHP code

PHP code

welcome.php Example Output



Viewing Client/Server Environment Variables

- Knowledge of a client's execution environment is useful to system administrators who want to provide client-specific information.
- Environment variables contain information about a script's environment, such as the client's web browser, the HTTP host and the HTTP connection.
  - The table on the next page summarizes some of the superglobal arrays defined by PHP.
- The XHTML document on page 19 displays the values of the server's environment variables in a table. PHP stores the server variables and their values in the $_SERVER array. Iterating through the array allows one to view all of the server's environment variables.

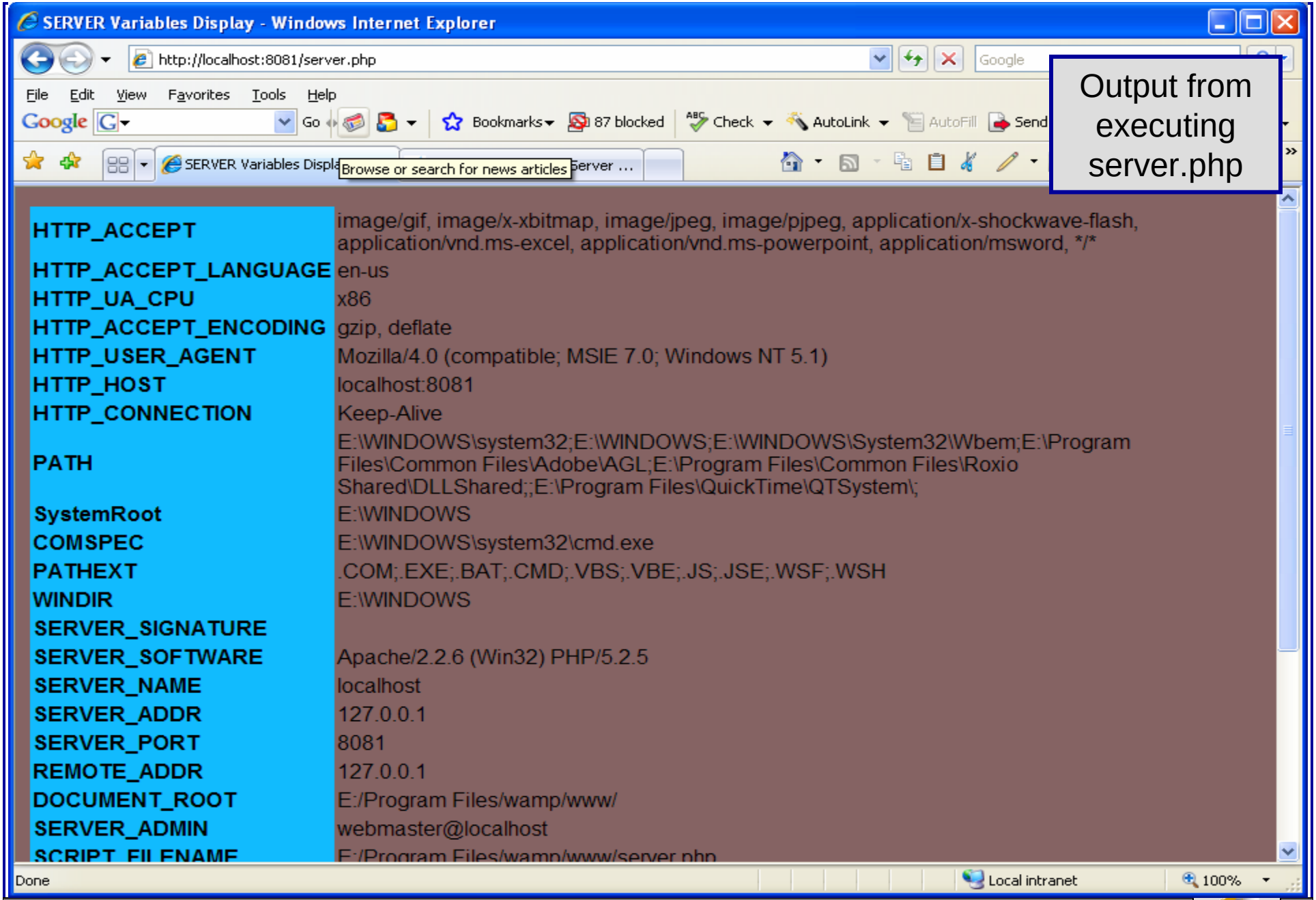
Some Superglobal Environment Arrays

Variable Name	Description
$_SERVER	Data about the currently running server.
$_ENV	Data about the client's environment.
$_GET	Data posted to the server by the `get` method.
$_POST	Data posted to the server by the `post` method.
$_COOKIE	Data contained in cookies on the client's computer.
$GLOBALS	Array containing all global variables.

server.php Example

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- server.php                    -->
<!-- Program to display $_SERVER variables -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>SERVER Variables Display</title>
  </head>

  <body style = "font-family: arial, sans-serif;
    background-color: #856363"  background=image1.jpg>

    <table border = "0" cellpadding = "2" cellspacing = "0"
      width = "100%">
    <?php
      // print the key and value for each element
      // in the $_SERVER array
      foreach ( $_SERVER as $key => $value )
        print( "<tr><td bgcolor = \"#11bbff\">
          <strong>$key</strong></td> <td>$value</td></tr>" );
    ?>
    </table>
  </body>
</html>
```

Iterate through the $_SERVER array to list all of the SERVER variables for the current server on which PHP is running.


SERVER Variables Display - Windows Internet Explorer
http://localhost:8081/server.php
Output from executing server.php
HTTP_ACCEPT image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, application/x-shockwave-flash, application/vnd.ms-excel, application/vnd.ms-powerpoint, application/msword, */*
HTTP_ACCEPT_LANGUAGE en-us
HTTP_UA_CPU x86
HTTP_ACCEPT_ENCODING gzip, deflate
HTTP_USER_AGENT Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1)
HTTP_HOST localhost:8081
HTTP_CONNECTION Keep-Alive
PATH E:\WINDOWS\system32;E:\WINDOWS;E:\WINDOWS\System32\Wbem;E:\Program Files\Common Files\Adobe\AGL;E:\Program Files\Common Files\Roxio Shared\DLLShared;;E:\Program Files\QuickTime\QTSystem\;
SystemRoot E:\WINDOWS
COMSPEC E:\WINDOWS\system32\cmd.exe
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
WINDIR E:\WINDOWS
SERVER_SIGNATURE
SERVER_SOFTWARE Apache/2.2.6 (Win32) PHP/5.2.5
SERVER_NAME localhost
SERVER_ADDR 127.0.0.1
SERVER_PORT 8081
REMOTE_ADDR 127.0.0.1
DOCUMENT_ROOT E:/Program Files/wamp/www/
SERVER_ADMIN webmaster@localhost
Done
Local intranet
100%

Form Processing and Business Logic

- XHTML forms enable web pages to collect data from users and send it to a web server for processing.
- Interaction of this kind between users and web servers is vital to e-commerce applications. Such capabilities allow users to purchase products, request information, send and receive web-based email, perform on-line paging and take advantage of various other online services.
- The XHTML document on the next few pages collects information from a user for the purposes of adding them to a mailing list.
- The PHP file on page 23 validates the data entered by the user through the form and "registers" them in the mailing list database.

form.html Example

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- form.html                    -->
<!-- Form for use with the form.php program -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>Sample form to take user input in XHTML</title>
  </head>
  <body>

    <h1>This is a sample registration form.</h1>

    Please fill in all fields and click Register.
    <!-- post form data to form.php -->
    <form method = "post" action = "form.php">
      <img src = "images/user.gif" alt = "User" /><br />
      <span style = "color: blue">
        Please fill out the fields below.<br />
      </span>
      <!-- create four text boxes for user input -->
      <img src = "images/fname.gif" alt = "First Name" />
      <input type = "text" name = "fname" /><br />
```

This XHTML document generates the form that the user will submit to the server via form.php

```
<img src = "images/lname.gif" alt = "Last Name" />
<input type = "text" name = "lname" /><br />
<img src = "images/email.gif" alt = "Email" />
<input type = "text" name = "email" /><br />
<img src = "images/phone.gif" alt = "Phone" />
<input type = "text" name = "phone" /><br />
<span style = "font-size: 10pt">
  Must be in the form (555)555-5555</span>
<br /><br />
<img src = "images/downloads.gif"
  alt = "Products" /><br />

<span style = "color: blue">
  Which publication would you like information about?
</span><br />

<!-- create drop-down list containing magazine names -->
<select name = "magazine">
  <option>Velo-News</option>
  <option>Cycling Weekly</option>
  <option>Pro Cycling</option>
  <option>Cycle Sport</option>
        <option>RadSport</option>
        <option>Mirror du Cyclisme</option>
</select>
<br /><br />
```


```
        <img src = "images/os.gif" alt = "Operating System" />
        <br /><span style = "color: blue">
          Which operating system are you currently using?
        <br /></span>
        <!-- create five radio buttons -->
        <input type = "radio" name = "os" value = "Windows XP"
          checked = "checked" />
          Windows XP
        <input type = "radio" name = "os" value =
          "Windows 2000" />
          Windows 2000
        <input type = "radio" name = "os" value =
          "Windows 98" />
          Windows 98<br />
        <input type = "radio" name = "os" value = "Linux" />
          Linux

        <input type = "radio" name = "os" value = "Other" />
          Other<br />

         <!-- create a submit button -->
        <input type = "submit" value = "Register" />
      </form>

    </body>
  </html>
```


form.php Example

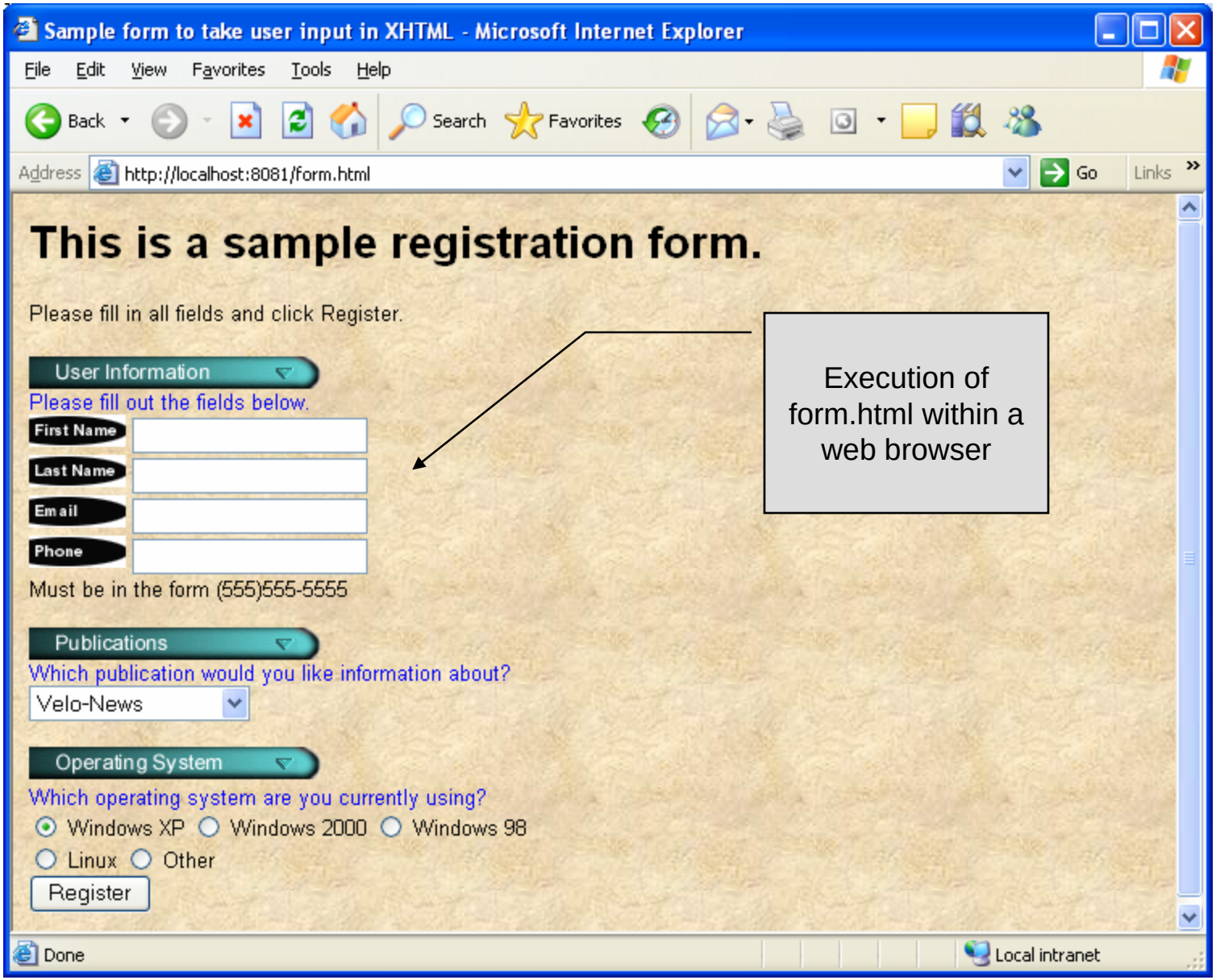
```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- form.php     -->
<!-- Read information sent from form.html -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>Form Validation</title>
  </head>
  <body style = "font-family: arial,sans-serif">

    <?php
      extract($_POST);
      // determine whether phone number is valid and print an error message if not
      if ( !ereg( "^\([0-9]{3}\)[0-9]{3}-[0-9]{4}$",
        $phone ) ){
        print( "<p><span style = \"color: red; font-size: 2em\">
          INVALID PHONE NUMBER:</span><br />
          A valid phone number must be in the form
          <strong>(555)555-5555</strong><br />
          <span style = \"color: blue\">
          Click the Back button, enter a valid phone number and resubmit.<br /><br />
          Thank You.</span></p></body></html>" );
        die(); // terminate script execution
      }
    ?>
```

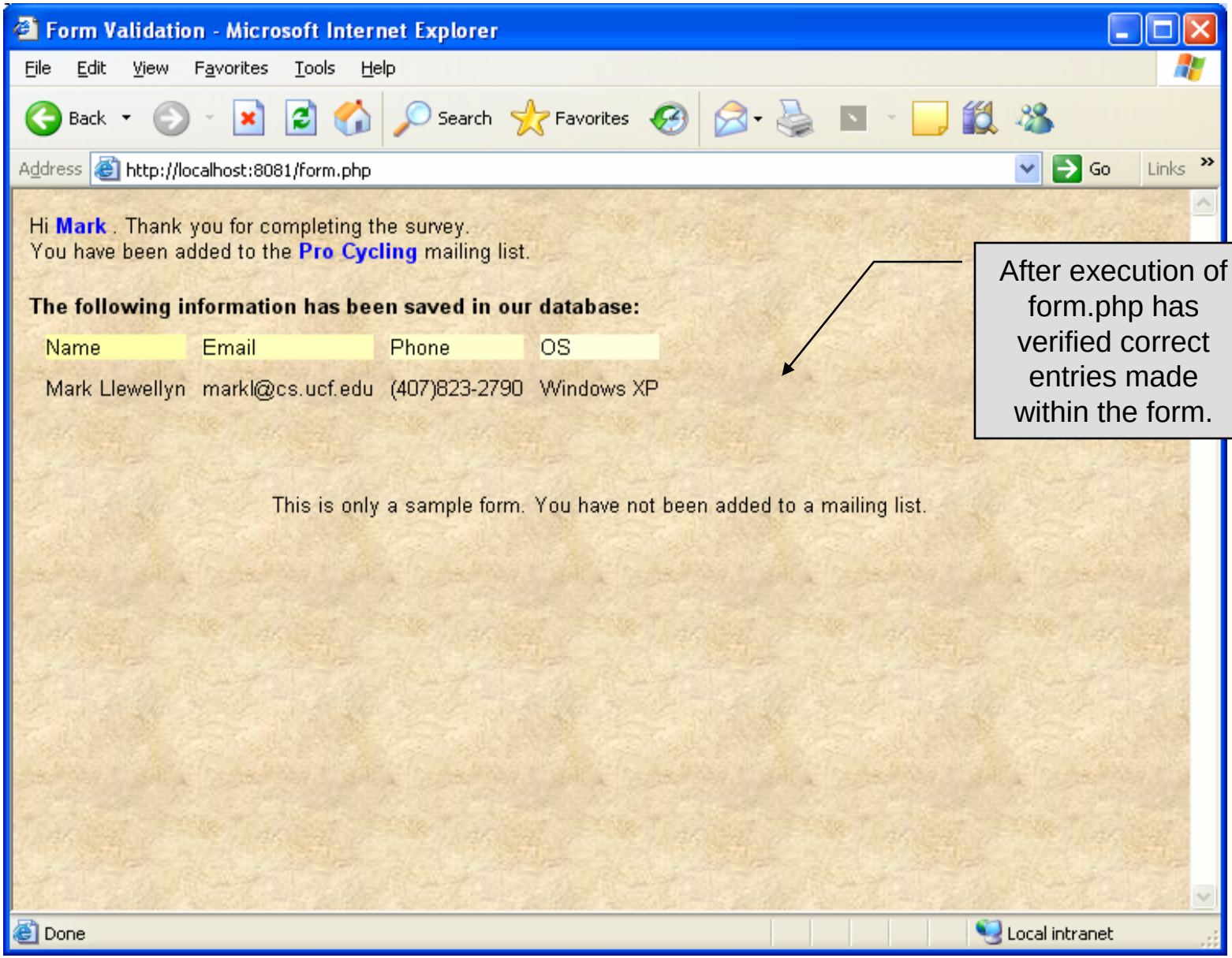
Function extract (associativeArray) creates a variable-value pair corresponding to each key-value pair in the associative array $_POST.

See page 36 for explanation of regular expressions.

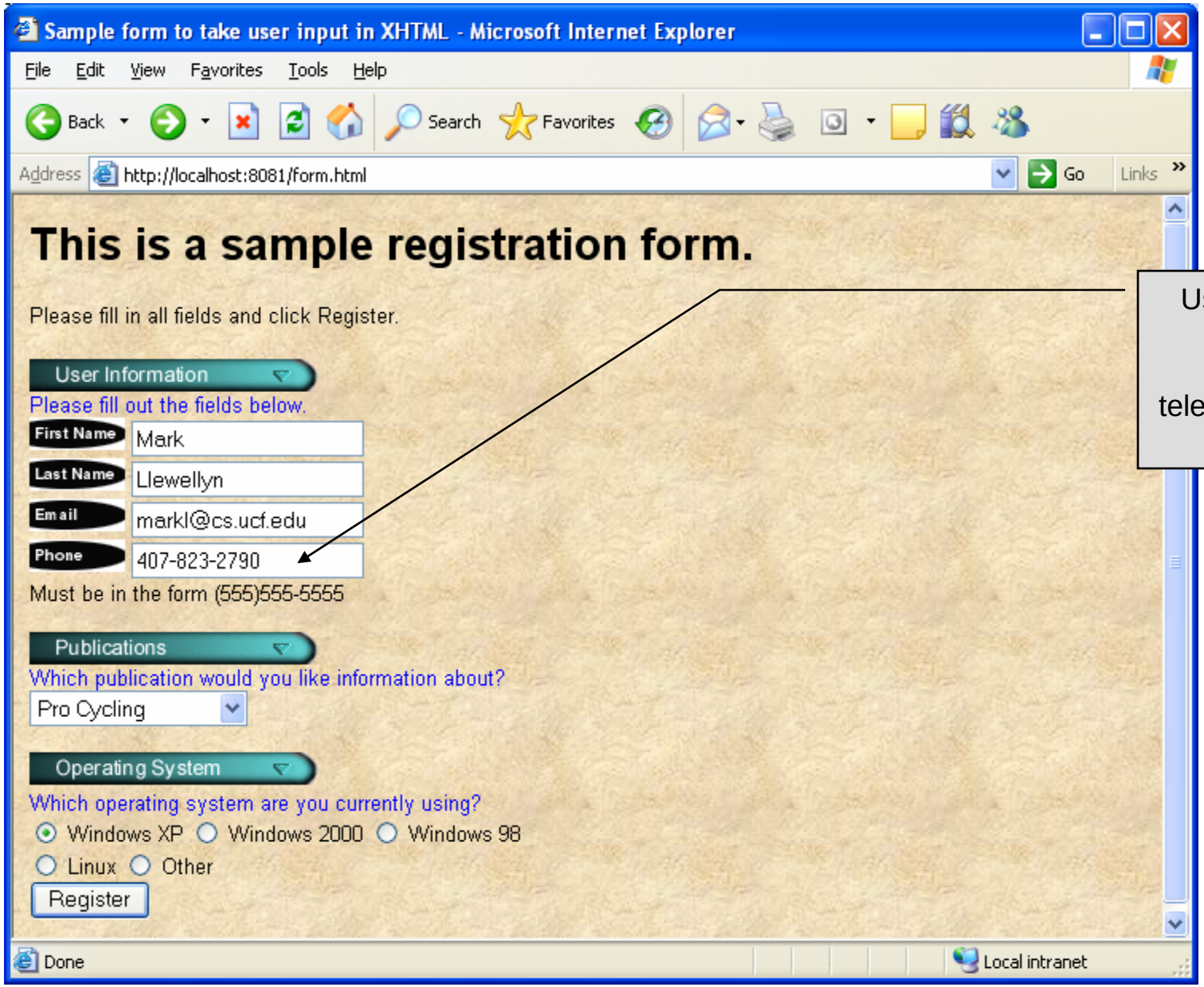
Function die() terminates script execution. An error has occurred, no need to continue.

```
<p>Hi
  <span style = "color: blue"> <strong> <?php print( "$fname" ); ?>  </strong> </span>.
  Thank you for completing the survey.<br />
  You have been added to the  <span style = "color: blue">
    <strong>  <?php print( "$magazine " ); ?>  </strong> </span> mailing list.
</p>
<strong>The following information has been saved in our database:</strong><br />
 <table border = "0" cellpadding = "0" cellspacing = "10">
  <tr>
    <td bgcolor = "#ffffaa">Name </td>
    <td bgcolor = "#ffffbb">Email</td>
    <td bgcolor = "#ffffcc">Phone</td>
    <td bgcolor = "#ffffdd">OS</td>
  </tr>
  <tr>
    <?php
      // print each form field's value
      print( "<td>$fname $lname</td> <td>$email</td> <td>$phone</td> <td>$os</td>" );
    ?>
  </tr>
 </table>
<br /><br /><br />
 <div style = "font-size: 10pt; text-align: center">
   This is only a sample form.   You have not been added to a mailing list.
 </div>
</body>
</html>
```

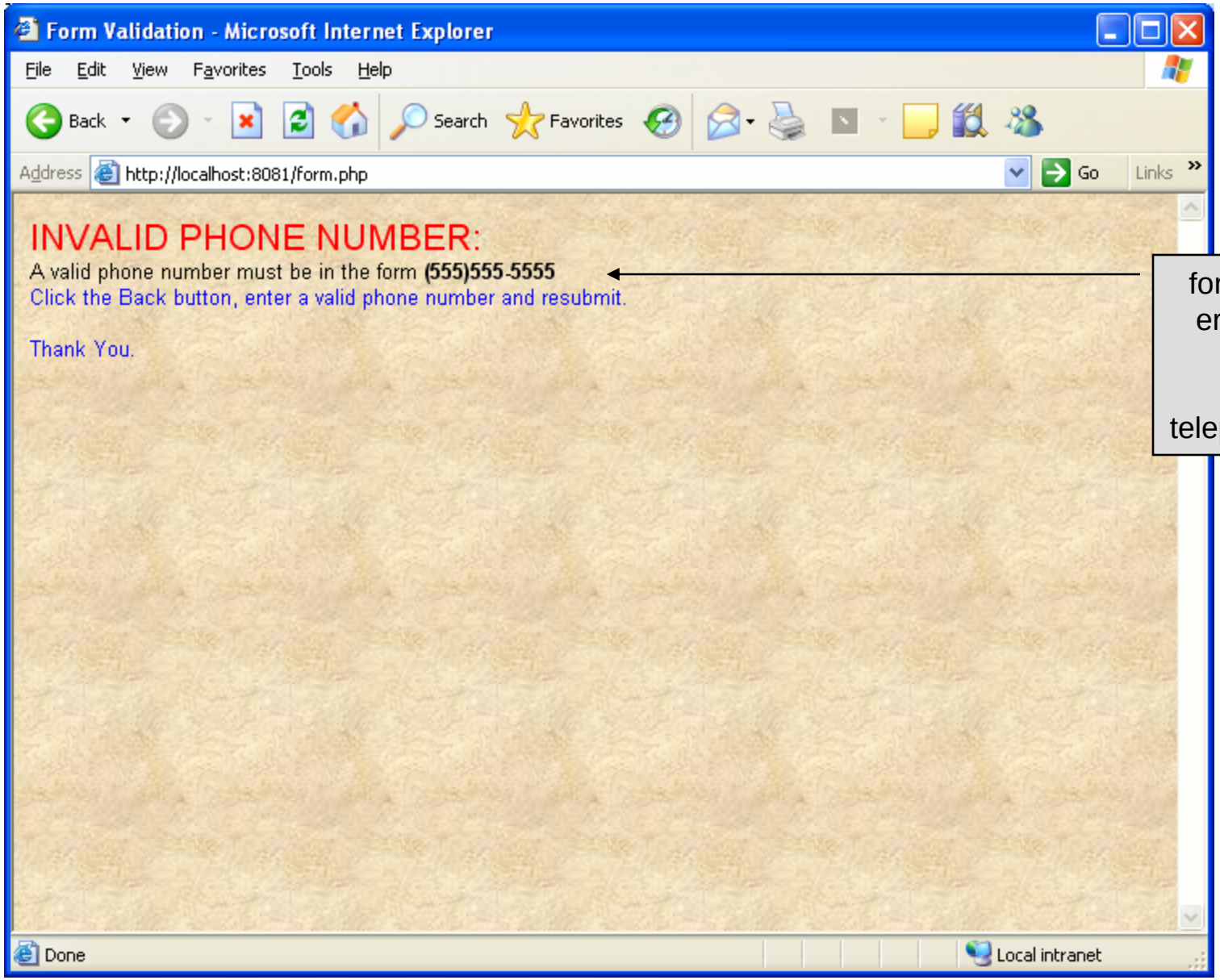


Sample form to take user input in XHTML - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:8081/form.html
Go Links
This is a sample registration form.
Please fill in all fields and click Register.
User Information
Please fill out the fields below.
First Name
Last Name
Email
Phone
Must be in the form (555)555-5555
Publications
Which publication would you like information about?
Velo-News
Operating System
Which operating system are you currently using?
Windows XP Windows 2000 Windows 98
Linux Other
Register
Done
Local intranet
Execution of form.html within a web browser



After execution of form.php has verified correct entries made within the form.



User enters an improperly formatted telephone number in the form.



form.php issues error regarding improperly formatted telephone number.

How the Form Example Works

- The `action` attribute of the `form` element, indicates that when the user clicks the `Register` button, the form data will be posted to `form.php` for processing.
- Using `method = "post"` appends the form data to the browser request that contains the protocol (i.e., HTTP) and the requested resource's URL. Scripts located on the web server's machine (or accessible through the network) can access the form data sent as part of the request.
- Each of the form's input fields are assigned a unique name. When `Register` is clicked, each field's `name` and `value` are sent to the web server.
- Script `form.php` then accesses the value for each specific field through the global array `$_POST`.

How the Form Example Works (cont.)

- The superglobal arrays are associative arrays predefined by PHP that hold variable acquired from the user input, the environment, or the web server and are accessible in any variable scope.
  - If the information from the form had been submitted via the HTTP method `get`, then the superglobal array `$_GET` would contain the name-value pairs.
- Since the HTML form and the PHP script "communicate" via the name-value pairs, it is a good idea to make the XHTML object names meaningful so that the PHP script that retrieves the data is easier to understand.

Register_globals

- In PHP versions 4.2 and higher, the directive `register_globals` is set to `Off` by default for security reasons.
- Turning off `register_globals` means that all variables sent from an XHTML form to a PHP document now must be accessed using the appropriate superglobal array (either `$_POST` or `$_GET`).
- When this directive was turned `On`, as was the default case in PHP versions prior to 4.2, PHP created an individual global variable corresponding to each form field.

Validation of Form Generated Data

- The form example illustrates an important concept in the validation of user input. In this case, we simply checked the validity of the format of the telephone number entered by the client user.
- In general, it is crucial to validate information that will be entered into database or used in mailing lists. For example, validation can be used to ensure that credit-card numbers contain the proper number of digits before the numbers are encrypted to a merchant.
- In this case, the form.php script is implementing the business logic or business rules for our application.

Pattern Matching in PHP

- For powerful string comparisons (pattern matching), PHP provides functions `ereg` and `preg_match`, which use regular expressions to search a string for a specified pattern.
- Function `ereg` uses Portable Operating System Interface (POSIX) extended regular expressions.
  - POSIX-extended regular expressions are a standard to which PHP regular expression conform.
- Function `preg_match` provides Perl-compatible regular expressions.
- Perl-compatible regular expressions are more widely used that POSIX regular expressions. PHP's support for Perl-compatible regular expressions eases migration from Perl to PHP. The following examples illustrates these concepts.

expression.php - Example

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- expression.php -->
<!-- Using regular expressions -->
<html xmlns = "http://www.w3.org/1999/xhtml">
   <head>
      <title>Regular expressions</title>
   </head>
   <body>
      <?php
         $search = "Now is the time";
         print( "Test string is: '$search'<br /><br />" );
         // call function ereg to search for pattern 'Now'  in variable search
         if ( ereg( "Now", $search ) )
            print( "String 'Now' was found.<br />" );

         // search for pattern 'Now' in the beginning of  the string
         if ( ereg( "^Now", $search ) )
            print( "String 'Now' found at beginning of the line.<br />" );

         // search for pattern 'Now' at the end of the string
         if ( ereg( "Now$", $search ) )
            print( "String 'Now' was found at the end of the line.<br />" );
```

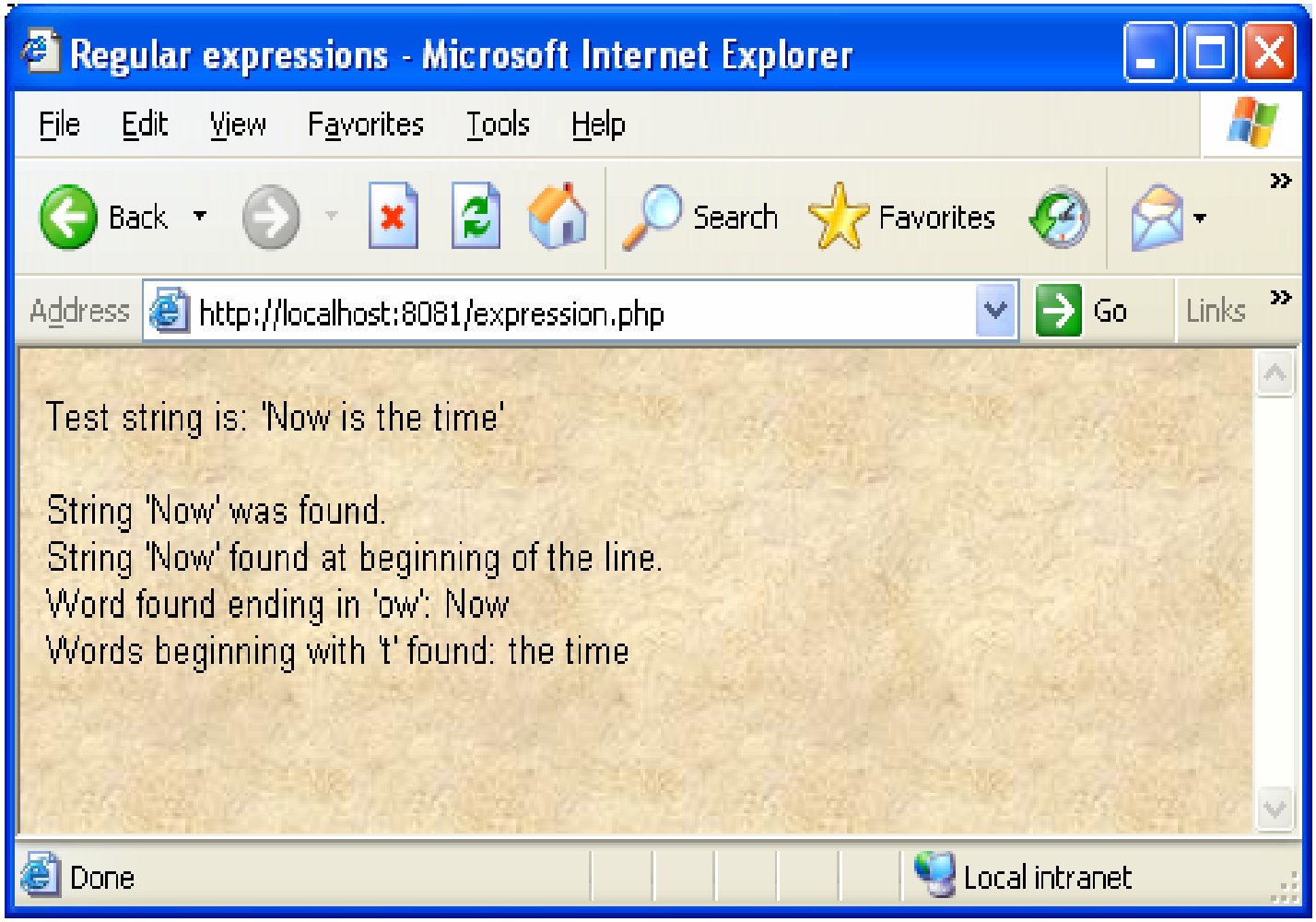
^ matches at beginning of a string

$ matches at end of a string

```
        // search for any word ending in 'ow'
        if ( ereg( "[[:<:]]([a-zA-Z]*ow)[[:>:]]", $search,
           $match ) )
           print( "Word found ending in 'ow': " .
              $match[ 1 ] . "<br />" );

        // search for any words beginning with 't'
        print( "Words beginning with 't' found: ");

        while ( eregi( "[[:<:]](t[[:alpha:]]+)[[:>:]]",
           $search, $match ) ) {
           print( $match[ 1 ] . " " );

          // remove the first occurrence of a word beginning
          // with 't' to find other instances in the string
          $search = ereg_replace( $match[ 1 ], "", $search );
        }

        print( "<br />" );
     ?>
  </body>
</html>
```

Uses a regular expression to match a word ending in "ow".

Output From `expression.php` - Example



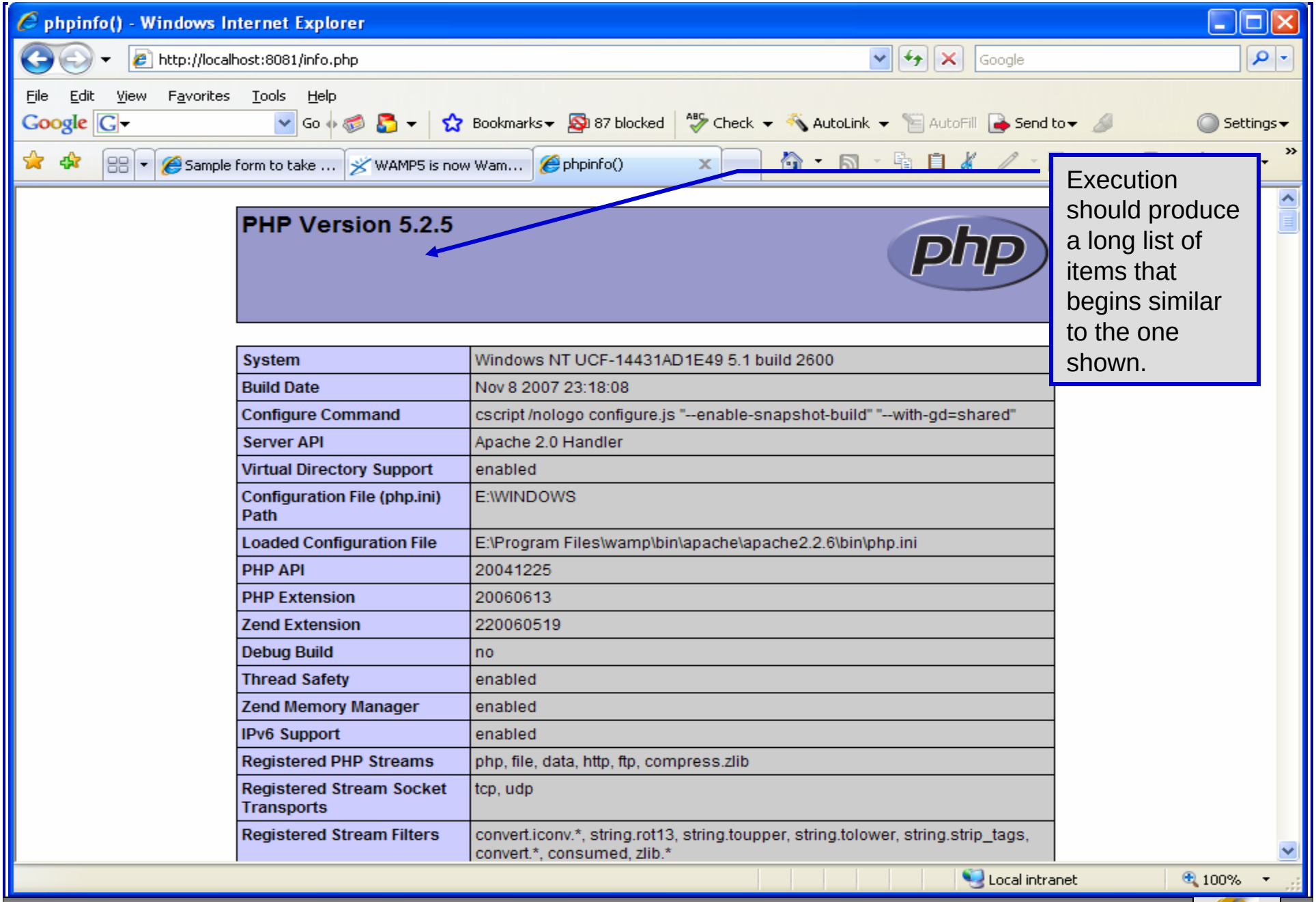
Checking Your PHP Set-up

- Once you get your web server (WAMP) installed, the simplest way to test your installation is to create a PHP file and execute it.
- Create a PHP file containing the following single line:

```
<?php  phpinfo()  ?>
```

- Save this file in the `www` folder in the WAMP folder (there may already be some files in this folder).
- Start the wamp server running and then access the PHP file through the browser with the following url:

http://localhost:8081/info.php


phpinfo() - Windows Internet Explorer
http://localhost:8081/info.php
Google
File Edit View Favorites Tools Help
Bookmarks 87 blocked Check AutoLink AutoFill Send to Settings
Sample form to take ...
WAMP5 is now Wam...
phpinfo()
PHP Version 5.2.5
php
Execution should produce a long list of items that begins similar to the one shown.
System | Windows NT UCF-14431AD1E49 5.1 build 2600
Build Date | Nov 8 2007 23:18:08
Configure Command | cscript /nologo configure.js "--enable-snapshot-build" "--with-gd=shared"
Server API | Apache 2.0 Handler
Virtual Directory Support | enabled
Configuration File (php.ini) Path | E:\WINDOWS
Loaded Configuration File | E:\Program Files\wamp\bin\apache\apache2.2.6\bin\php.ini
PHP API | 20041225
PHP Extension | 20060613
Zend Extension | 220060519
Debug Build | no
Thread Safety | enabled
Zend Memory Manager | enabled
IPv6 Support | enabled
Registered PHP Streams | php, file, data, http, ftp, compress.zlib
Registered Stream Socket Transports | tcp, udp
Registered Stream Filters | convert.iconv.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, zlib.*
Local intranet
100%

Verifying a Username and Password Using PHP

- It is often the case that a private website is created which is accessible only to certain individuals.
- Implementing privacy generally involves username and password verification.
- In the next example, we'll see an XHTML form that queries a user for a username and password. The fields USERNAME and PASSWORD are posted to the PHP script `verify.php` for verification.
  - For simplicity, data is not encrypted before sending it to the server.
  - For more information on PHP encryption functions visit: http://www.php.net/manual/en/ref.mcrypt.php.

password.html – page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<!-- password.html                    -->
<!-- XHTML form sent to password.php for verification -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>Verifying a username and a password.</title>
    <style type = "text/css">
      td { background-color: #DDDDDD }
    </style>
  </head>
  <body style = "font-family: arial">
    <p style = "font-size: 18pt">
    <font color=red><B> Welcome to the COP 4610 High Security WebPage </B></font><HR>
    <p style = "font-size: 13pt">
      Type in your username and password below.
      <br />
      <span style = "color: #0000FF; font-size: 10pt;
        font-weight: bold">
        Note that password will be sent as plain text - encryption not used in this application
      </span>
    </p>
```


password.html – page 2

```
<!-- post form data to password.php -->
<form action = "password.php" method = "post">
  <br />
    <table border = "3" cellspacing = "3"  style = "height: 90px; width: 150px;
    font-size: 10pt" cellpadding = "1">
    <tr>
      <td colspan = "3">  <strong>Username:</strong>  </td>
    </tr>
    <tr>
      <td colspan = "3"> <input size = "40" name = "USERNAME"
          style = "height: 22px; width: 115px" />            </td>
    </tr>
    <tr>
      <td colspan = "3">  <strong>Password:</strong>    </td>
    </tr>
    <tr>
      <td colspan = "3">  <input size = "40" name = "PASSWORD"
          style = "height: 22px; width: 115px"  type = "password" /> <br/></td>
    </tr>
 <tr>
      <td colspan = "1">
        <input type = "submit" name = "Enter"  value = "Enter" style = "height: 23px;
          width: 47px" />       </td>
      <td colspan = "2">  <input type = "submit" name = "NewUser"   value = "New User"
          style = "height: 23px" />
      </td>
    </tr>
 </table>     </form>     <HR>   </body>    </html>
```


password.php – page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- password.php      -->
<!-- Searching a database for usernames and passwords. -->

<html xmlns = "http://www.w3.org/1999/xhtml">
   <head>
      <?php
         extract( $_POST );
         // check if user has left USERNAME or PASSWORD field blank
         if ( !$USERNAME || !$PASSWORD ) {
            fieldsBlank();
            die();
         }
         // check if the New User button was clicked
         if ( isset( $NewUser ) ) {
            // open password.txt for writing using append mode
            if ( !( $file = fopen( "password.txt", "a" ) ) ) {

               // print error message and terminate script
               // execution if file cannot be opened
               print( "<title>Error</title></head><body>
                  Could not open password file
                  </body></html>" );
               die();
            }
```


password.php – page 2

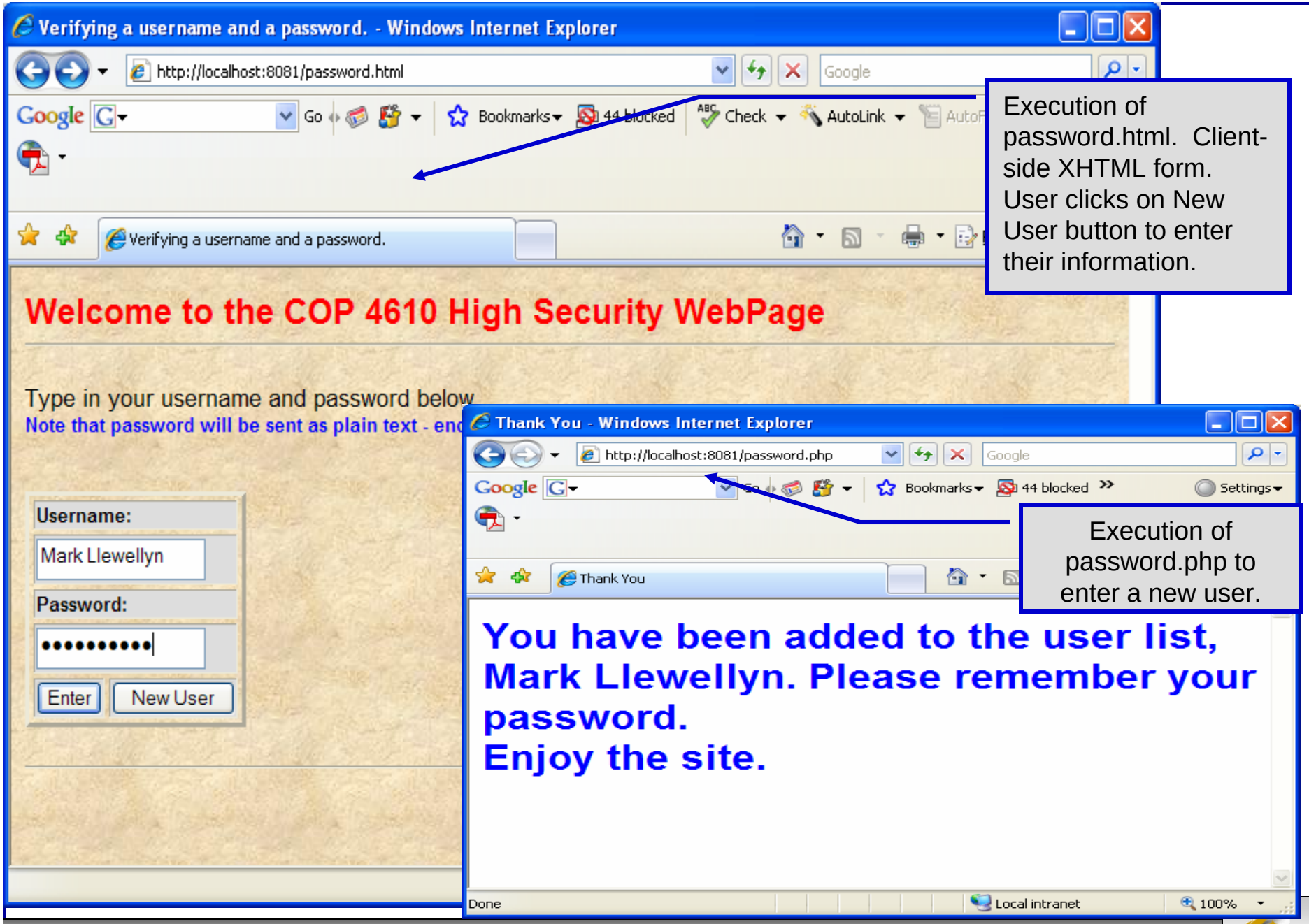
```
   // write username and password to file and call function userAdded
   fputs( $file, "$USERNAME,$PASSWORD\n" );
   userAdded( $USERNAME );
}
else {

   // if a new user is not being added, open file
   // for reading
   if ( !( $file = fopen( "password.txt",  "r" ) ) ) {
      print( "<title>Error</title></head>
         <body>Could not open password file
         </body></html>" );
      die();
   }

   $userVerified = 0;

   // read each line in file and check username and password
   while ( !feof( $file ) && !$userVerified ) {

      // read line from file
      $line = fgets( $file, 255 );

      // remove newline character from end of line
      $line = chop( $line );

      // split username and password using comma delimited string
      $field = split( ",", $line, 2 );
```

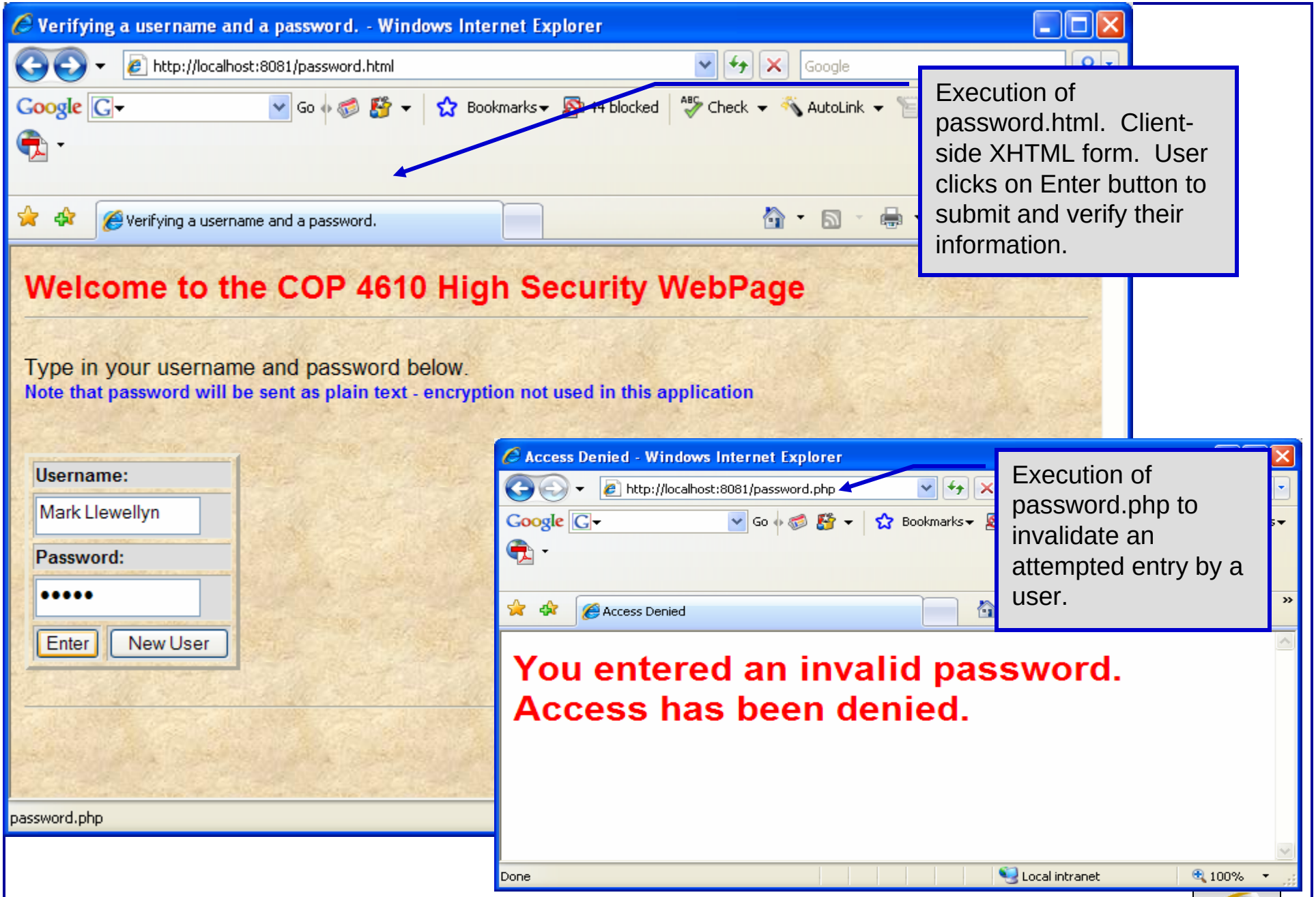

```
      // verify username
      if ( $USERNAME == $field[ 0 ] ) {
         $userVerified = 1;

         // call function checkPassword to verify user's password
         if ( checkPassword( $PASSWORD, $field ) == true )
            accessGranted( $USERNAME );
         else
            wrongPassword();
      }
   }

   // close text file
   fclose( $file );

   // call function accessDenied if username has not been verified
   if ( !$userVerified )
      accessDenied();
}

 // verify user password and return a boolean
function checkPassword( $userpassword, $filedata )
{
   if ( $userpassword == $filedata[ 1 ] )
      return true;
   else
      return false;
}
```


password.php – page 4

```
// print a message indicating the user has been added
function userAdded( $name )  {
   print( "<title>Thank You</title></head>
      <body style = \"font-family: arial;
      font-size: 1em; color: blue\">
      <strong>You have been added
      to the user list, $name.  Please remember your password.
      <br />Enjoy the site.</strong>" );
}

 // print a message indicating permission has been granted
function accessGranted( $name )  {
   print( "<title>Thank You</title></head>
      <body style = \"font-family: arial;
      font-size: 1em; color: blue\">
      <strong>Permission has been
      granted, $name. <br />
      Enjoy the site.</strong>" );
}
// print a message indicating password is invalid
function wrongPassword()   {
   print( "<title>Access Denied</title></head>
      <body style = \"font-family: arial;
      font-size: 1em; color: red\">
      <strong>You entered an invalid
      password.<br />Access has
      been denied.</strong>" );
}
```

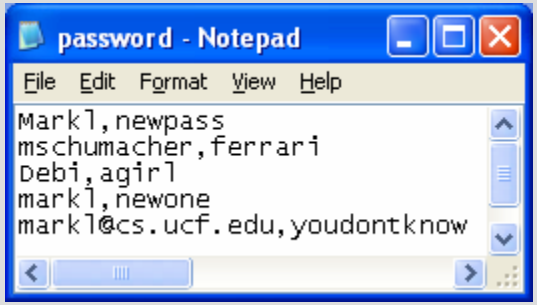

```
// print a message indicating access has been denied
        function accessDenied()   {
           print( "<title>Access Denied</title></head>
              <body style = \"font-family: arial;
              font-size: 1em; color: red\">
              <strong>
              You were denied access to this server.
              <br /></strong>" );
        }

         // print a message indicating that fields
         // have been left blank
        function fieldsBlank()   {
           print( "<title>Access Denied</title></head>
              <body style = \"font-family: arial;
              font-size: 1em; color: red\">
              <strong>
              Please fill in all form fields.
              <br /></strong>" );
        }
     ?>
  </body>
</html>
```



Verifying a username and a password. - Windows Internet Explorer
http://localhost:8081/password.html
Google
Bookmarks
44 blocked
Check
AutoLink
Verifying a username and a password.
Welcome to the COP 4610 High Security WebPage
Type in your username and password below
Note that password will be sent as plain text - enc
Username:
Mark Llewellyn
Password:
Enter
New User
Execution of password.html. Client-side XHTML form. User clicks on New User button to enter their information.
Thank You - Windows Internet Explorer
http://localhost:8081/password.php
Google
Bookmarks
44 blocked
Settings
Thank You
You have been added to the user list, Mark Llewellyn. Please remember your password.
Enjoy the site.
Done
Local intranet
100%
Execution of password.php to enter a new user.


Verifying a username and a password. - Windows Internet Explorer
http://localhost:8081/password.html
Google
Go
Bookmarks
14 blocked
Check
AutoLink
Verifying a username and a password.
Welcome to the COP 4610 High Security WebPage
Type in your username and password below.
Note that password will be sent as plain text - encryption not used in this application
Username:
Mark Llewellyn
Password:
Enter
New User
password.php
Execution of password.html. Client-side XHTML form. User clicks on Enter button to submit and verify their information.
Access Denied - Windows Internet Explorer
http://localhost:8081/password.php
Access Denied
You entered an invalid password.
Access has been denied.
Done
Local intranet
100%
Execution of password.php to invalidate an attempted entry by a user.

How password.php Works

- The PHP script `password.php` verifies the client's username and password by querying a database. For this example, the "database" of usernames and passwords is just a text file (for simplicity). Existing users are validated against this file, and new users are appended to it.



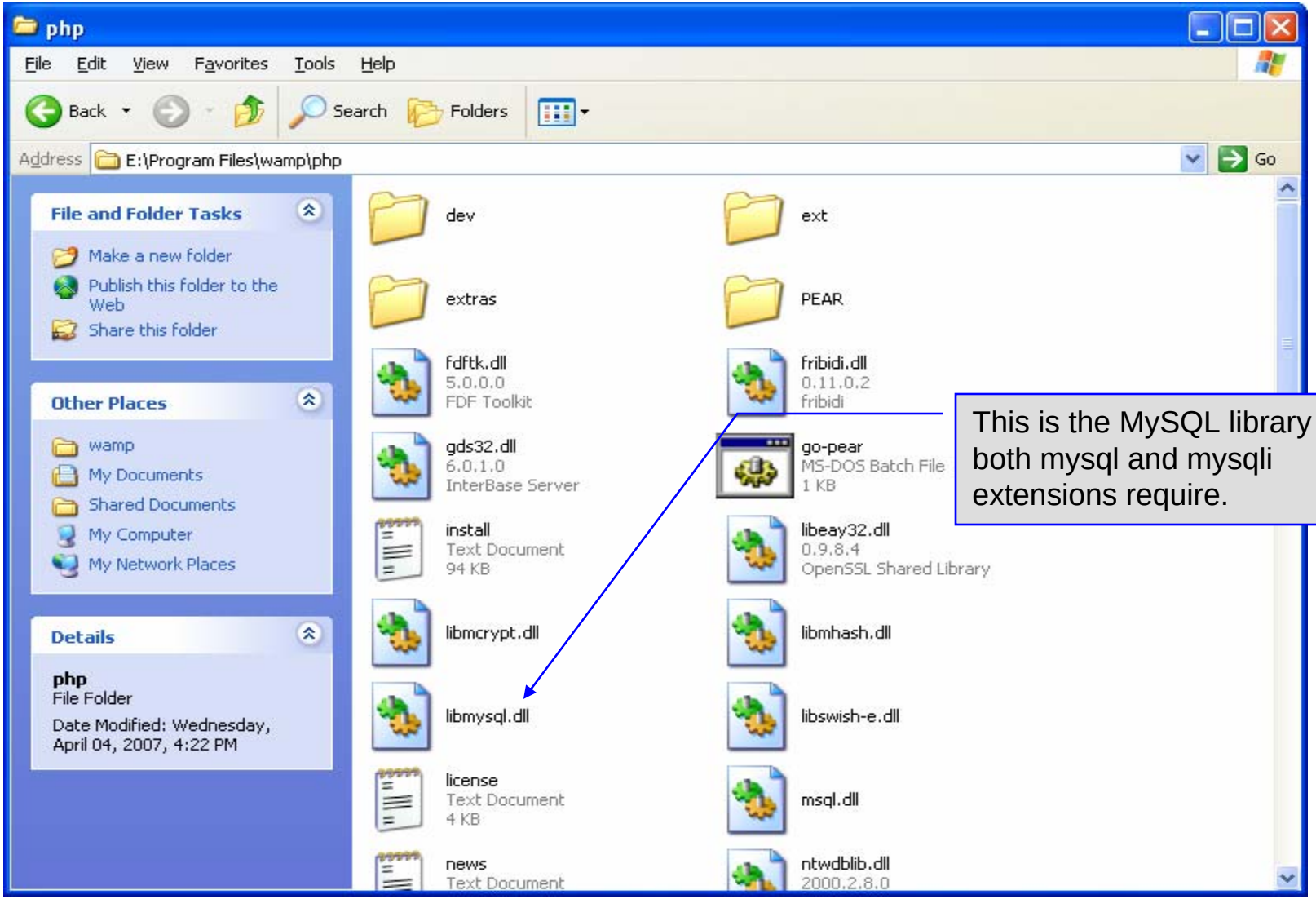
The password.txt "database"

- Whether we are dealing with a new user is determined by calling function `isset` to test if variable `$NewUser` has been set.
- When the user submits the password.html form to the server, they click either Enter or New User button. After calling function extract, either variable `$NewUser` or `$Enter` is created depending on which button was selected. If `$NewUser` has not been set, we assume the user clicked Enter.

PHP and Database Connectivity

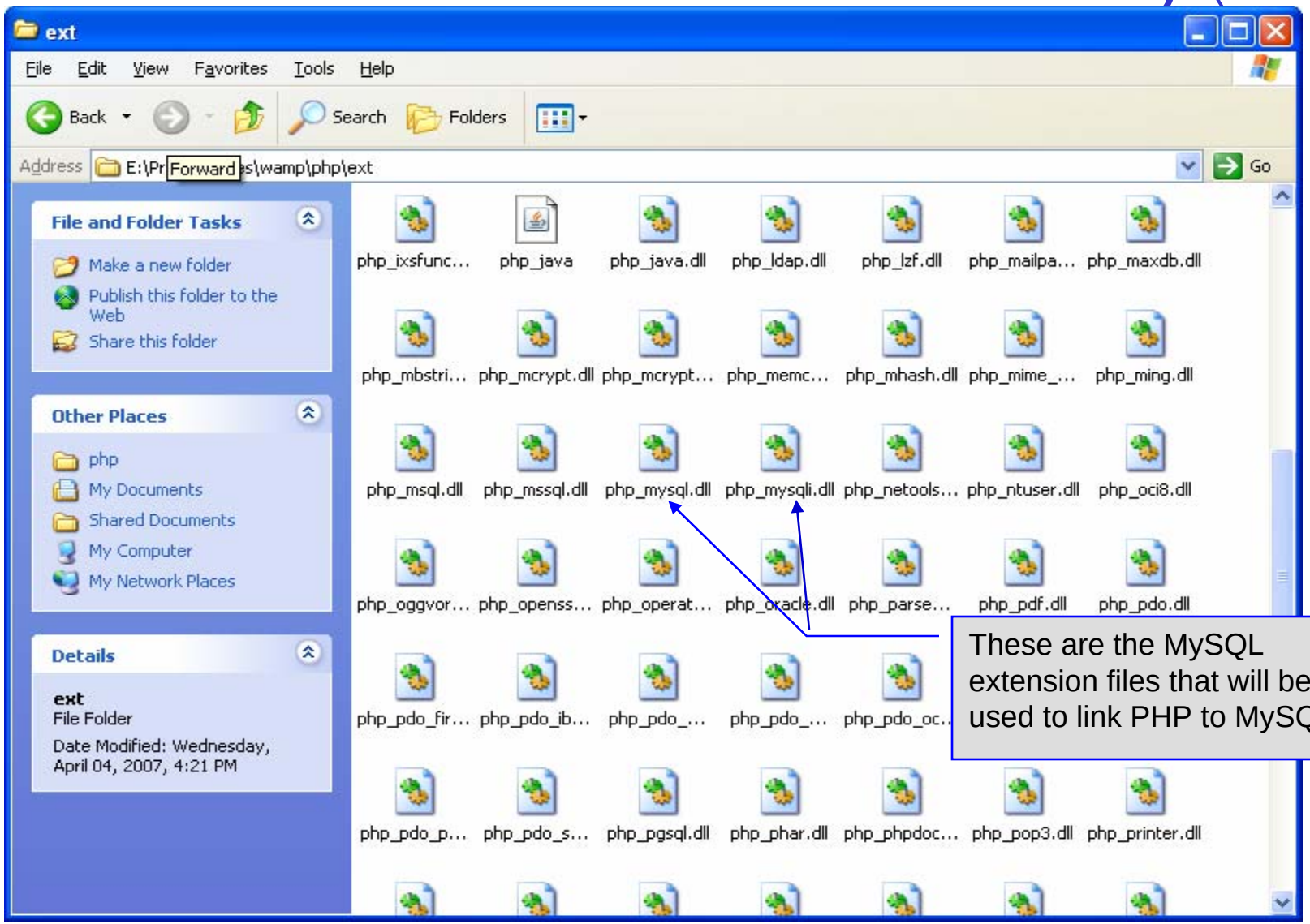
- PHP offers built-in support for a wide variety of database systems from Unix DBM through relational systems such as MySQL to full size commercial systems like Oracle.
- We'll continue to use MySQL as the underlying database system so that you can easily compare the work we've done with MySQL using Java servlets and JSPs.
- Before you go any further in these notes you must configure PHP to access MySQL databases. Beginning with PHP 5, MySQL is not enabled by default in PHP, nor is the MySQL library bundled with PHP.
  - Versions of MySQL greater than 4.1.0 use MySQLi extensions.
  - Versions of MySQL less than 4.1.0 use MySQL extensions.

PHP and Database Connectivity (cont.)

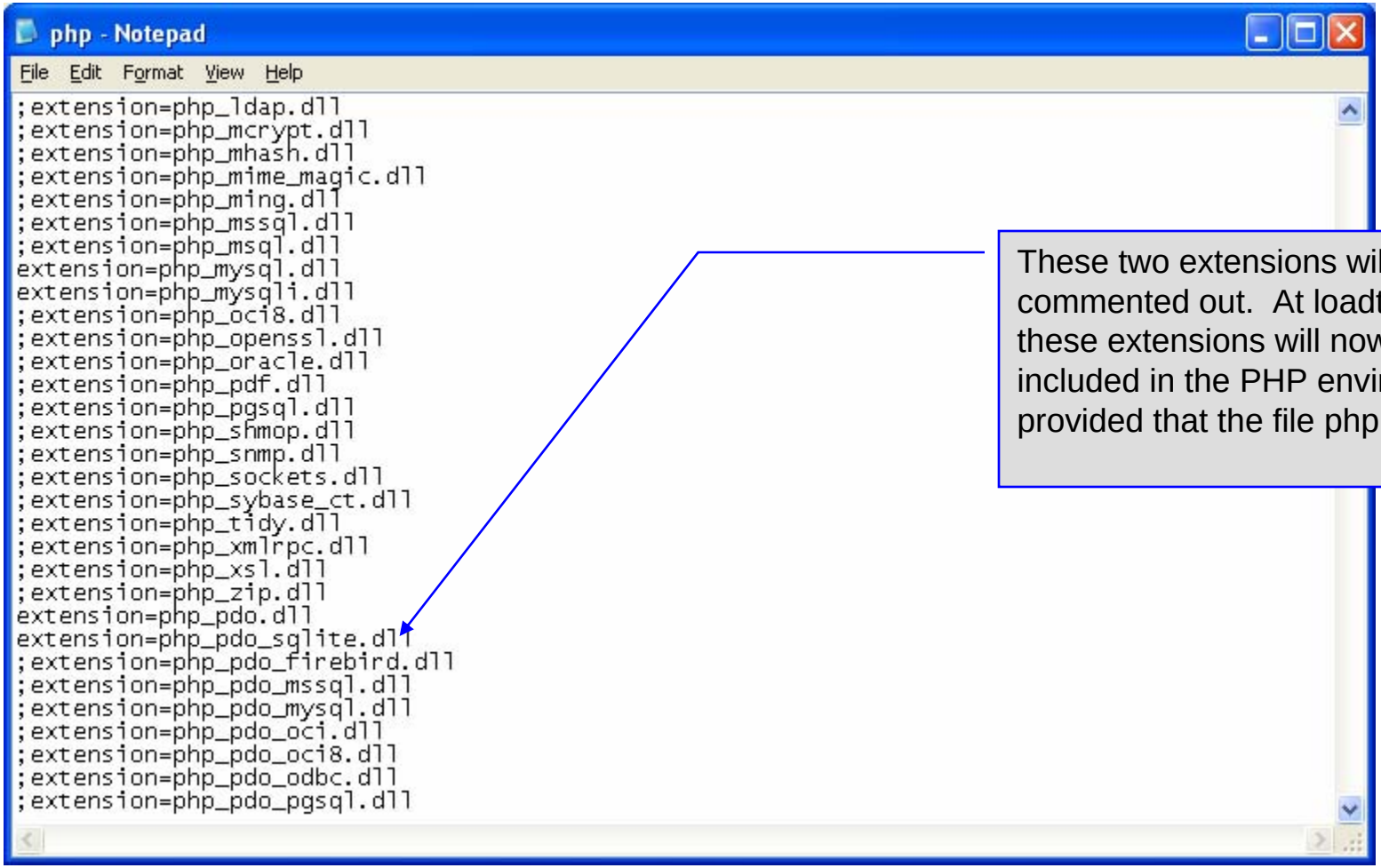


This is the MySQL library that both mysql and mysqli extensions require.

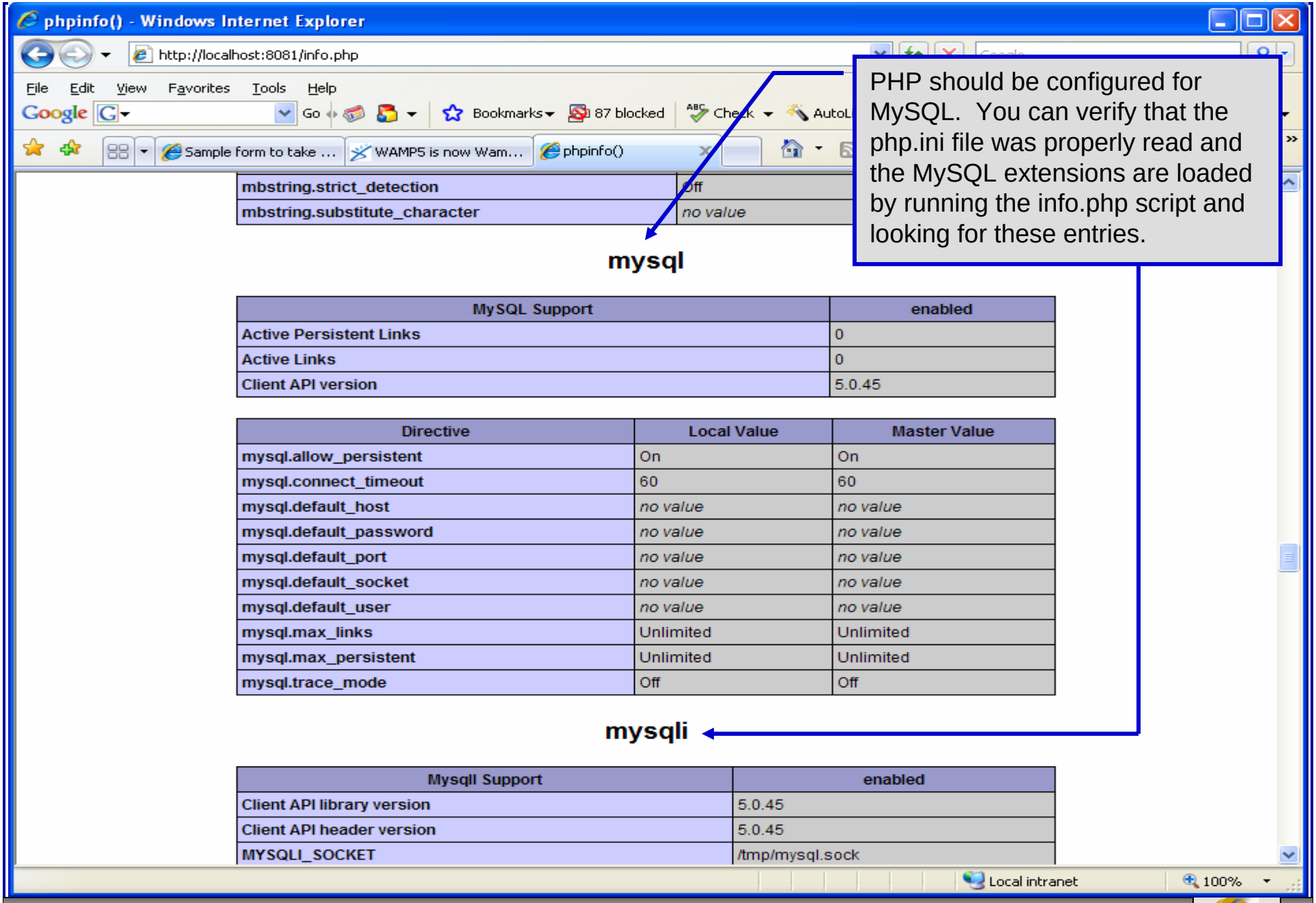
PHP and Database Connectivity (cont.)



PHP and Database Connectivity (cont.)



These two extensions will not be commented out. At loadtime, these extensions will now be included in the PHP environment, provided that the file php.ini is set..


phpinfo() - Windows Internet Explorer
http://localhost:8081/info.php
File Edit View Favorites Tools Help
Sample form to take ...
WAMP5 is now Wam...
phpinfo()
mbstring.strict_detection Off
mbstring.substitute_character no value
mysql
MySQL Support enabled
Active Persistent Links 0
Active Links 0
Client API version 5.0.45
Directive Local Value Master Value
mysql.allow_persistent On On
mysql.connect_timeout 60 60
mysql.default_host no value no value
mysql.default_password no value no value
mysql.default_port no value no value
mysql.default_socket no value no value
mysql.default_user no value no value
mysql.max_links Unlimited Unlimited
mysql.max_persistent Unlimited Unlimited
mysql.trace_mode Off Off
mysqli
Mysqli Support enabled
Client API library version 5.0.45
Client API header version 5.0.45
MYSQLI_SOCKET /tmp/mysql.sock
Local intranet
100%
PHP should be configured for MySQL. You can verify that the php.ini file was properly read and the MySQL extensions are loaded by running the info.php script and looking for these entries.

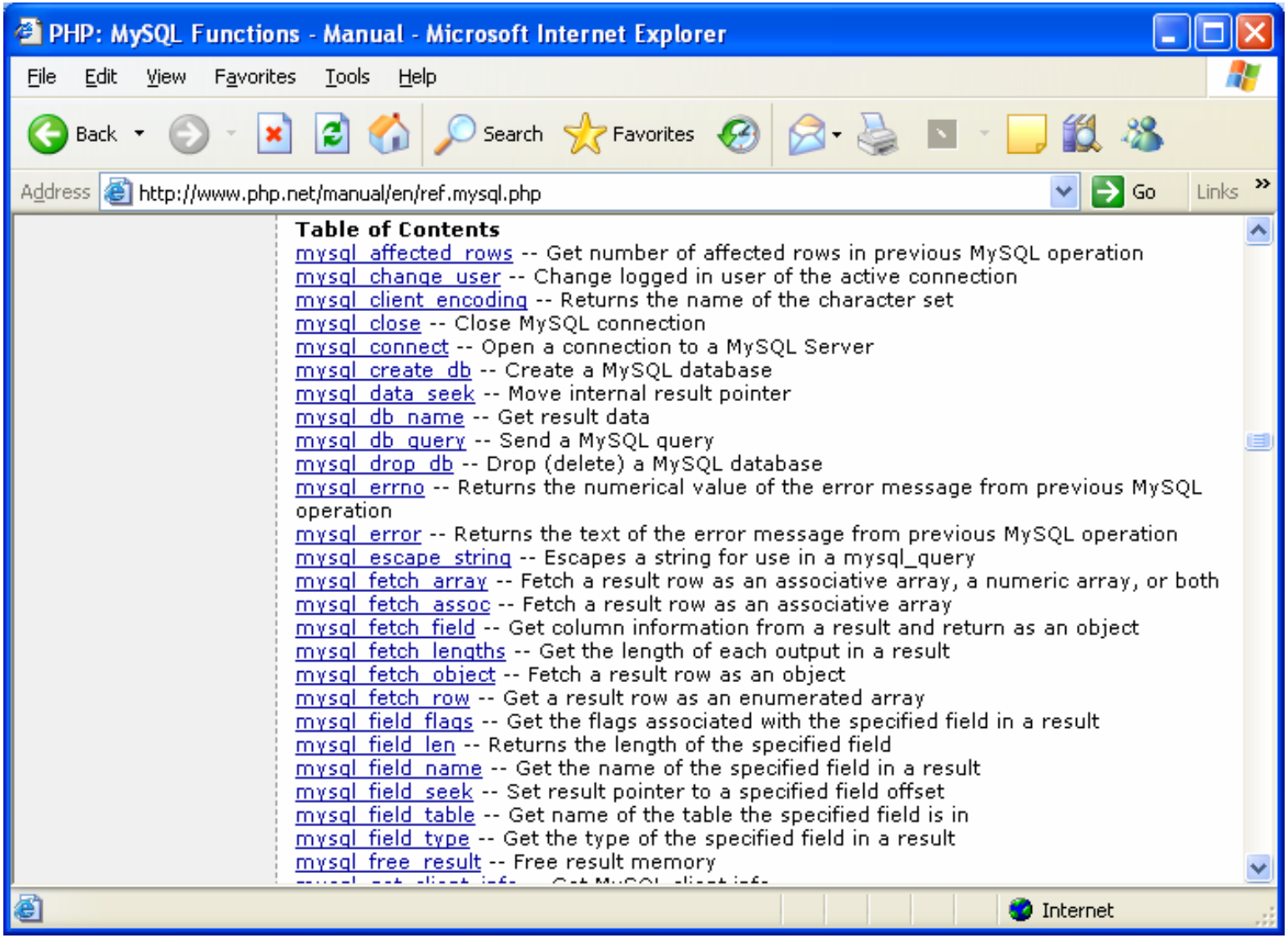
PHP and Database Connectivity (cont.)

- PHP contains a fairly extensive set of commands that can be used to access and manipulate MySQL databases.
- A very brief listing of some of these commands appears on the next page.
- For a complete listing see:

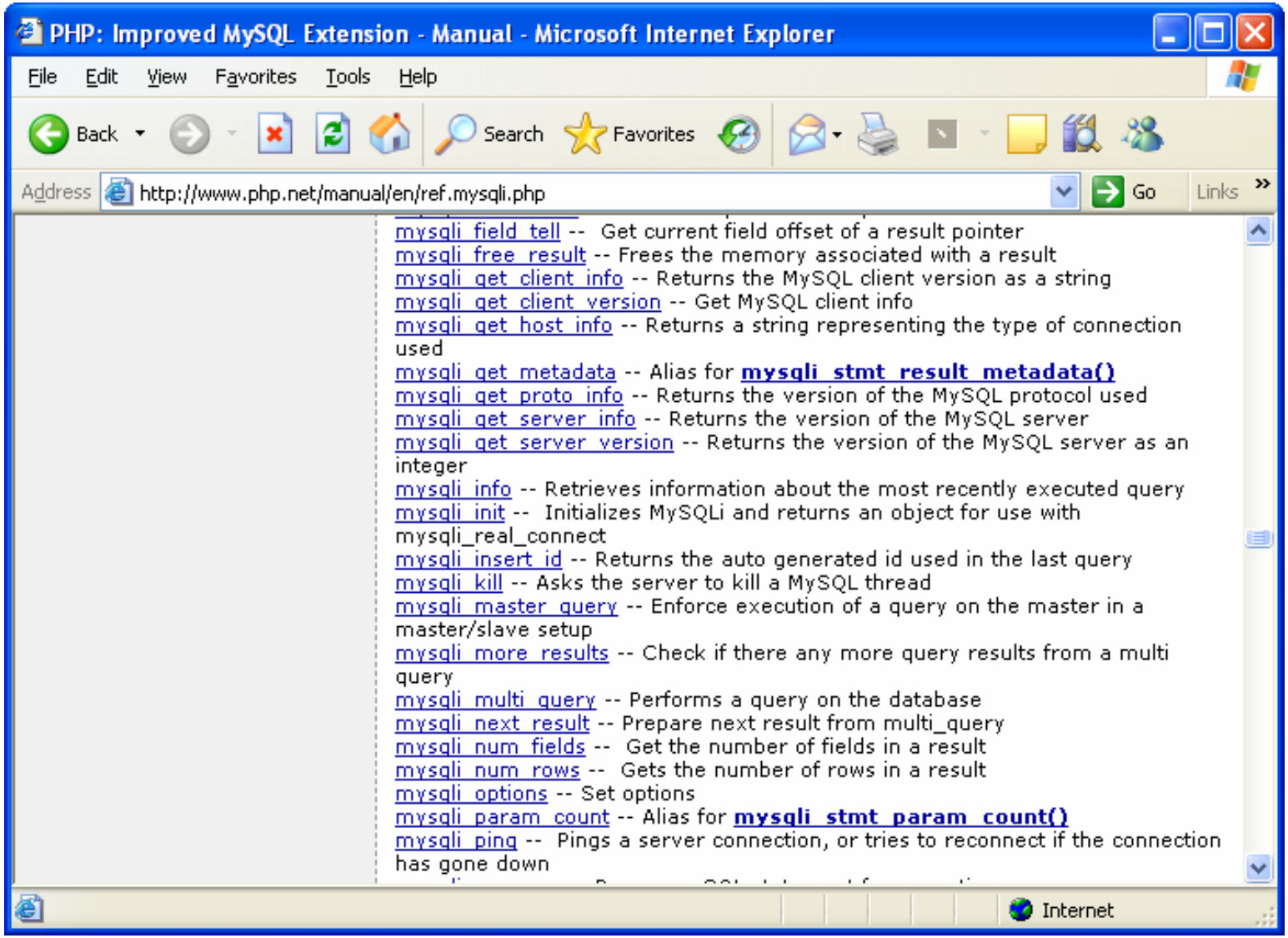
  http://us2.php.net/manual/en/print/ref.mysql.php.

  http://us2.php.net/manual/en/print/ref.mysqli.php.

Portion of `mysql.dll` Extension



Portion of `mysqli.dll` Extension



PHP and Database Connectivity (cont.)

- Now that you have PHP set to accept MySQL extensions, let's connect to the bike database that we used for examples with Java servlets and JSPs.
- The following example is a simple database connection process in PHP where the client interacts with the database from an XHTML form that simply asks them to select which attributes from the bikes table that they would like to display. This is done through the `data.html` file.
- When the client clicks the submit query button, the `database.php` script executes by connecting to the database, posting the query, retrieving the results, and displaying them to the client.

data.html

Client side

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- data.html     -->
<!-- Querying a MySQL Database From a PHP Script -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>      <title>Sample Database Query From PHP</title>   </head>
  <body style = "background-color: #545454" background=image1.jpg >
    <h2 style = "font-family: arial color: blue"> Querying a MySQL database from a PHP Script. </h2>
    <form method = "post" action = "database.php">
      <p>Select a field to display:
        <!-- add a select box containing options for SELECT query   -->
        <select name = "select">
          <option selected = "selected">*</option>
          <option>bikename</option>
          <option>size</option>
          <option>color</option>
          <option>cost</option>
          <option>purchased</option>
          <option>mileage</option>
        </select>
      </p>
      <input type = "submit" value = "Send Query"   style = "background-color: blue;
        color: yellow; font-weight: bold" />
    </form>
  </body>   </html>
```


database.php

Server side

Page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- database.php        -->
<!-- Program to query a database and send results to the client.     -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>     <title>Database Search Results</title>   </head>

  <body style = "font-family: arial, sans-serif"
    style = "background-color: #4A766E" background=image1.jpg link=blue vlink=blue>
    <?php

      extract( $_POST );

      // build SELECT query
      $query = "SELECT " . $select . " FROM bikes";

      // Connect to MySQL
      if ( !( $database = mysqli_connect( "localhost",
        "root", "root", bikedb ) ) )
        die( "Could not connect to database" );
```

Default query is to select the attributes chosen by the client for use in a SELECT query.

Connect to MySQL database. URL, username, password, and database all specified.

database.php

Server side

Page 2

```
   // query bikedb database
   if ( !( $result = mysql_query( $database, $query ) ) ) {
      print( "Could not execute query! <br />" );
      die( mysql_error() );
   }
?>

<h3 style = "color: blue">
Database Search Results</h3>
<table border = "1" cellpadding = "3" cellspacing = "3"
   style = "background-color: #00FFFF">  <!-- ADD8E6  -->

   <?php
         // fetch meta-data
         $metadata = mysqli_fetch_fields( $result);
         print("<tr>");
         for ($i=0; $i<count($metadata); $i++){
                  print("<td>");
                  printf("%s",$metadata[$i]->name);
                  print("</td>");
         }
         print("</tr>");
```

Get metadata for the query

Display metadata in the top row of the table

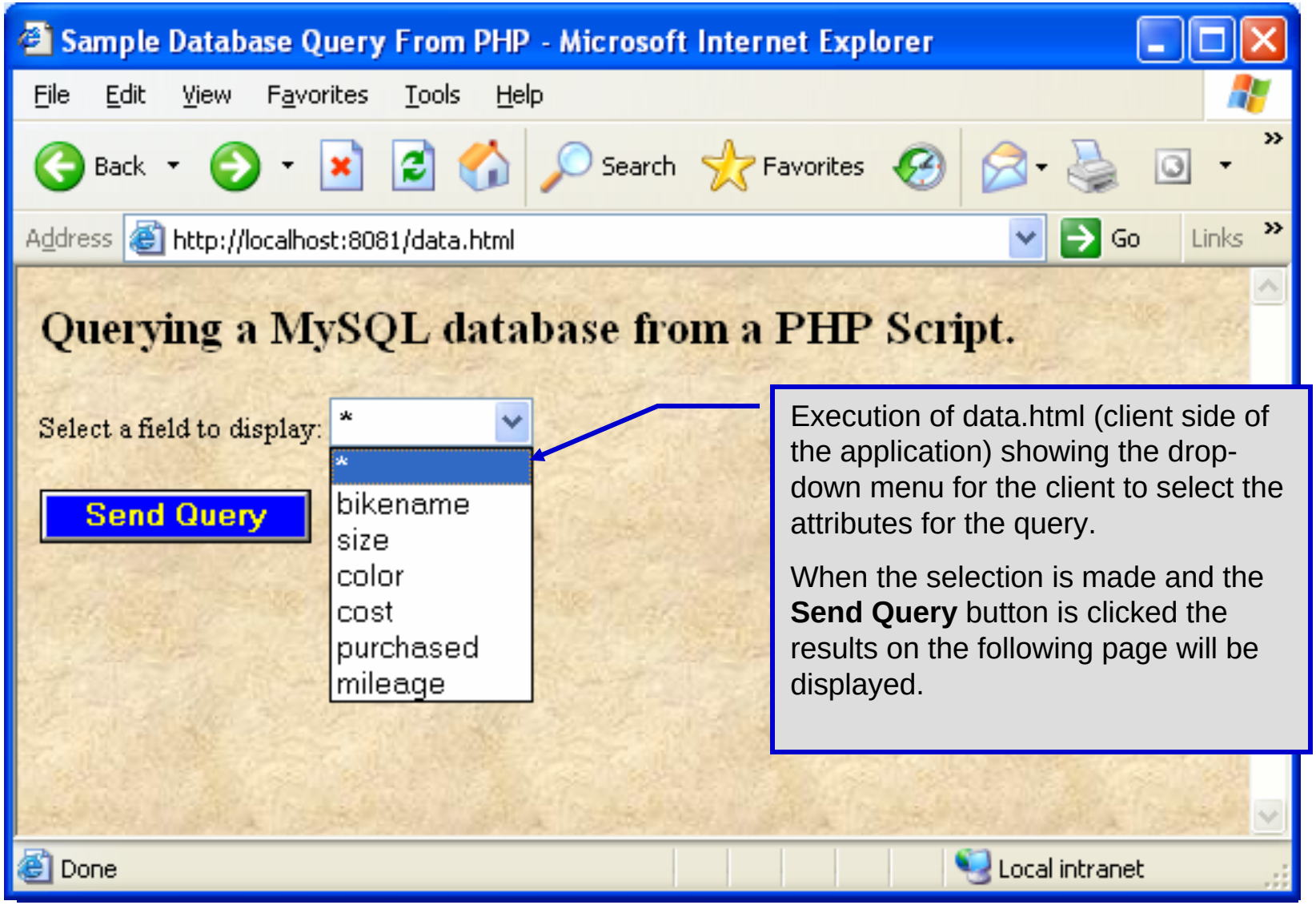
database.php

Server side

Page 3

```
      // fetch each record in result set
         for ( $counter = 0;
            $row = mysql_fetch_row( $result );
            $counter++ ){
            // build table to display results
            print( "<tr>" );
            foreach ( $row as $key => $value )
               print( "<td>$value</td>" );
            print( "</tr>" );
         }
         mysql_close( $database );
      ?>
   </table>
   <br />Your search yielded <strong>
         <?php print( "$counter" ) ?> results.<br /><br /></strong>
         <h5>Please email comments to
         <a href = "mailto:markl@cs.ucf.edu">
                              markl@cs.ucf.edu
          </a>
        </h5>
</body></html>
```

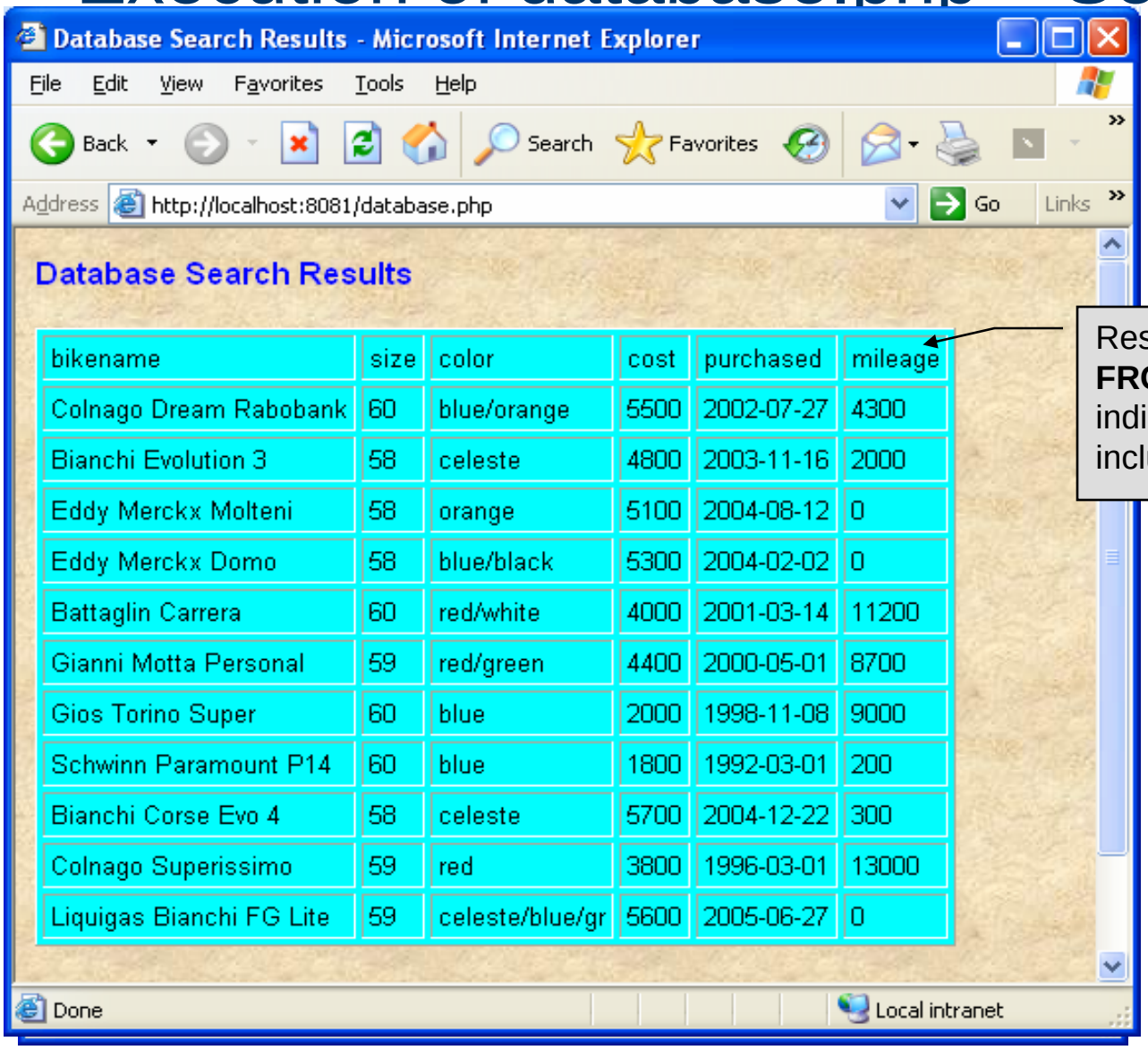

Execution of data.html – Client side



Execution of data.html (client side of the application) showing the drop-down menu for the client to select the attributes for the query.

When the selection is made and the **Send Query** button is clicked the results on the following page will be displayed.

Execution of database.php – Server side



bikename	size	color	cost	purchased	mileage
Colnago Dream Rabobank	60	blue/orange	5500	2002-07-27	4300
Bianchi Evolution 3	58	celeste	4800	2003-11-16	2000
Eddy Merckx Molteni	58	orange	5100	2004-08-12	0
Eddy Merckx Domo	58	blue/black	5300	2004-02-02	0
Battaglin Carrera	60	red/white	4000	2001-03-14	11200
Gianni Motta Personal	59	red/green	4400	2000-05-01	8700
Gios Torino Super	60	blue	2000	1998-11-08	9000
Schwinn Paramount P14	60	blue	1800	1992-03-01	200
Bianchi Corse Evo 4	58	celeste	5700	2004-12-22	300
Colnago Superissimo	59	red	3800	1996-03-01	13000
Liquigas Bianchi FG Lite	59	celeste/blue/gr	5600	2005-06-27	0

Results of query **SELECT * FROM bikes**. Display indicates that 10 rows were included in the result.

Cookies

- A cookie is a text file that a Web site stores on a client's computer to maintain information about the client during and between browsing sessions.
- A Web site can store a cookie on a client's computer to record user preferences and other information that the Web site can retrieve during the client's subsequent visits. For example, many Web sites use cookies to store client's zipcodes. The Web site can retrieve the zipcode from the cookie and provide weather reports and news updates tailored to the user's region.
- Web sites also use cookies to track information about client activity. Analysis of information collected via cookies can reveal the popularity of Web sites or products.

Cookies (cont.)

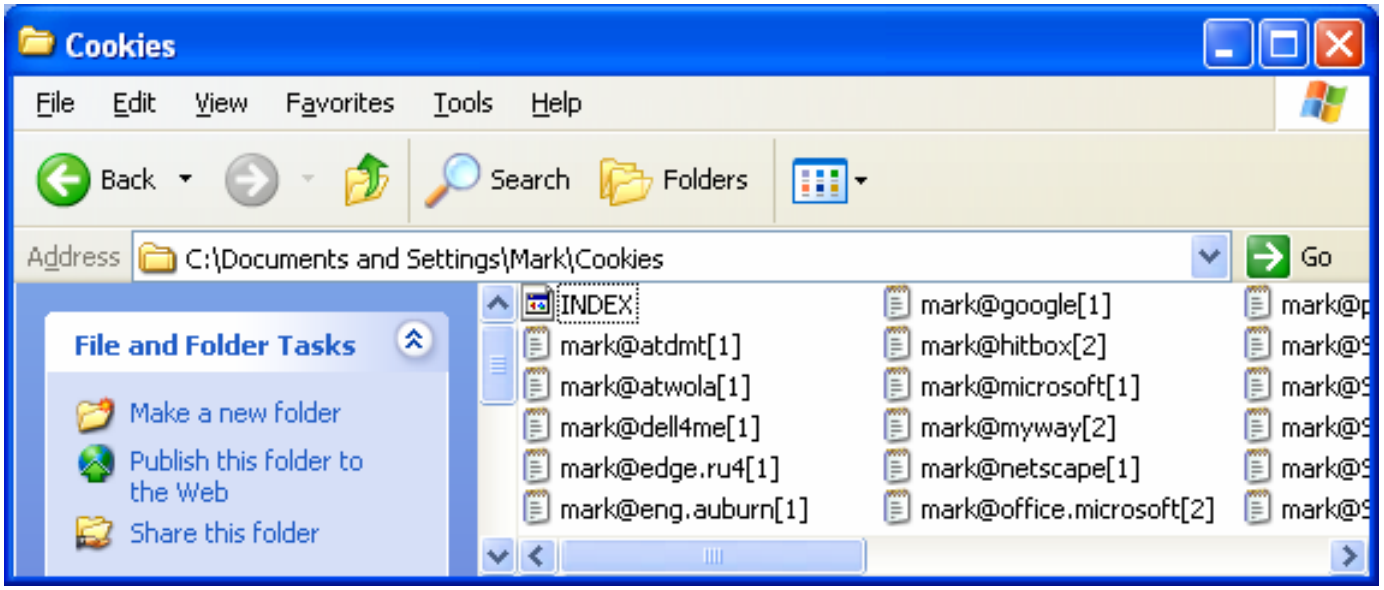
- Marketers use cookies to determine the effectiveness of advertising campaigns.
- Web sites store cookies on users' hard drives, which raises issues regarding security and privacy. Web sites should not store critical information, such as credit-card numbers or passwords, in cookies, because cookies are just text files that anyone can read.
- Several cookie features address security and privacy concerns. A server can access only the cookies that it has placed on the client.
- A cookies has an expiration date, after which the Web browser deletes it.

Cookies (cont.)

- Users who are concerned about the privacy and security implications of cookies can disable them in their Web browsers. However, the disabling of cookies can make it impossible for the user to interact with Web sites that rely on cookies to function properly.
- Information stored in the cookie is sent to the Web server from which it originated whenever the user requests a Web page from that particular server. The Web server can send the client XHTML output that reflects the preferences or information that is stored in the cookie.
- The location of the cookie file varies from browser to browser. Internet Explorer places cookies in the Cookies directory located at `C:\Documents and Settings\...\Cookies`

Cookies (cont.)

- After a cookie is created, a text file is added to this directory. While the name of the file will vary from user to user a typical example is shown below.



- The contents of a cookie are shown on page 43.

Cookies (cont.)

- Now let's create the code necessary to create our own cookie.
- In this example, a PHP script is invoked from a client-side HTML document. The HTML document creates a form for the user to enter the information that will be stored in the cookie. (Often the information that is stored in a cookie will be extracted from several different areas and may involved tracking the client's actions at the Web site.)
- Once the user has entered their information, when they click the Write Cookie button, the `cookies.php` script executes.
- The XHTML document and the PHP script are shown on the next pages. The XHTML document `cookies.html` is on page 36 and the PHP script `cookies.php` appears on page 37.

cookies.html – page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<!-- cookies.html -->
<!-- Writing a Cookie        -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title>Writing a cookie to the client computer</title>   </head>

  <body style = "font-family: arial, sans-serif;
    background-color: #856363"  background=image1.jpg>
    <h2>Click Write Cookie to save your cookie data.</h2>

    <form method = "post" action = "cookies.php" style = "font-size: 10pt"
            background-color: #856363">
      <strong>Name:</strong><br />
      <input type = "text" name = "NAME" /><br />
      <strong>Height:</strong><br />
      <input type = "text" name = "HEIGHT" /><br />
      <strong>Favorite Color:</strong><br />
      <input type = "text" name = "COLOR" /><br />
      <p>
        <input type = "submit" value = "Write Cookie"  style = "background-color: #0000FF;
          color: yellow;  font-weight: bold" /></p>
    </form>
  </body>  </html>
```

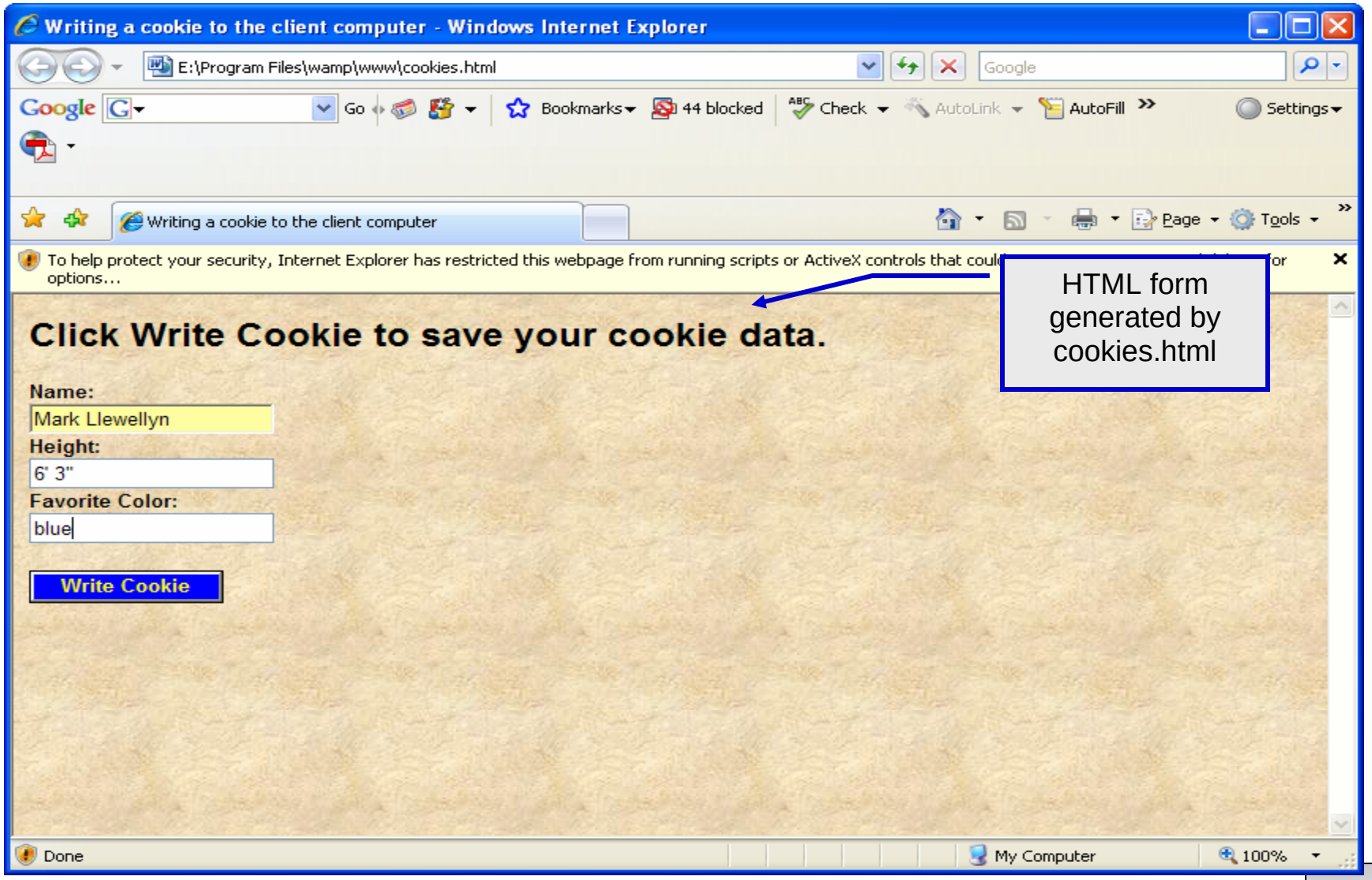

cookies.php – page 1

```
<?php
   // cookies.php
   // Program to write a cookie to a client's machine
    extract( $_POST );
   // write each form field's value to a cookie and set the
   // cookie's expiration date
   setcookie( "Name", $NAME, time() + 60 * 60 * 24 * 5 );
   setcookie( "Height", $HEIGHT, time() + 60 * 60 * 24 * 5 );
   setcookie( "Color", $COLOR, time() + 60 * 60 * 24 * 5 );
?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns = "http://www.w3.org/1999/xhtml">
   <head>      <title>Cookie Saved</title>   </head>
   <body style = "font-family: arial, sans-serif", background=image1.jpg>
      <p><b>The cookie has been set with the following data:</b></p>
      <!-- print each form field's value -->
      <br /><span style = "color: blue">Name:</span>
         <?php print( $NAME ) ?><br />
      <span style = "color: blue">Height:</span>
         <?php print( $HEIGHT ) ?><br />
      <span style = "color: blue">Favorite Color:</span>
      <span style = "color: <?php print( "$COLOR\">$COLOR" ) ?>
      </span><br />
      <p>Click <a href = "readCookies.php">here</a>  to read the saved cookie.</p>
   </body>  </html>
```

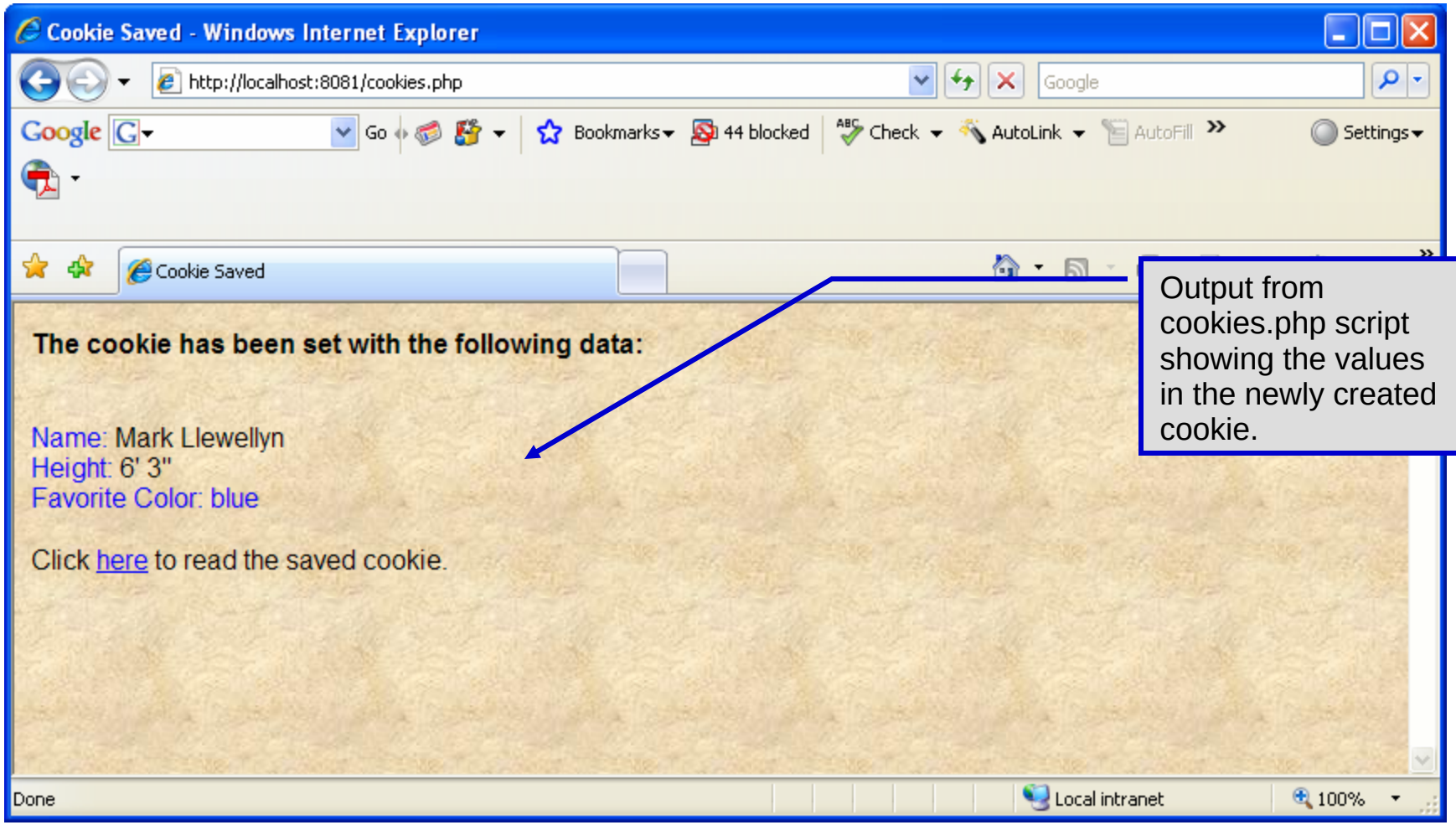
Function setcookie sets the cookies to the values passed from the cookies.html form. Function setcookie prints XHTML header information and therefore it needs to be called before any other XHTML (including comments) is printed.

The third argument to setcookie is optional and indicates the expiration date of the cookie. In this case it is set to expire 5 days from the current time. Function time returns the current time and then we add to this the number of seconds after which the cookie is to expire.

Cookies (cont.)



Cookies (cont.)



Cookies (cont.)

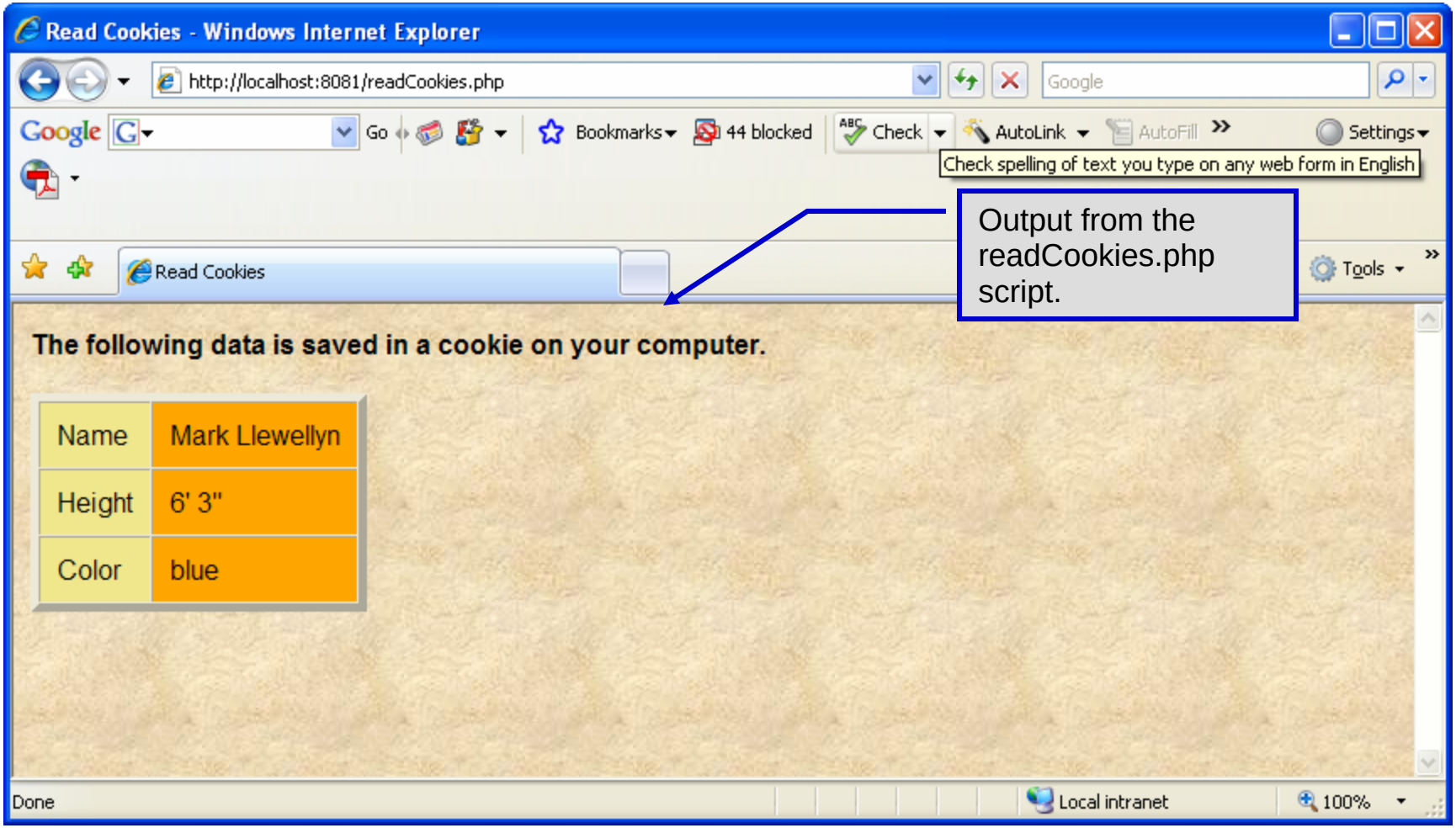
- Once the cookie has been created, the cookies.php script gives the user the chance to view the newly created cookie by invoking the readCookies.php script from within the cookies.php script by clicking on the link.
- The readCookies.php script code is illustrated on the next page followed by the output from the execution of this PHP script.

readCookies.php – page 1

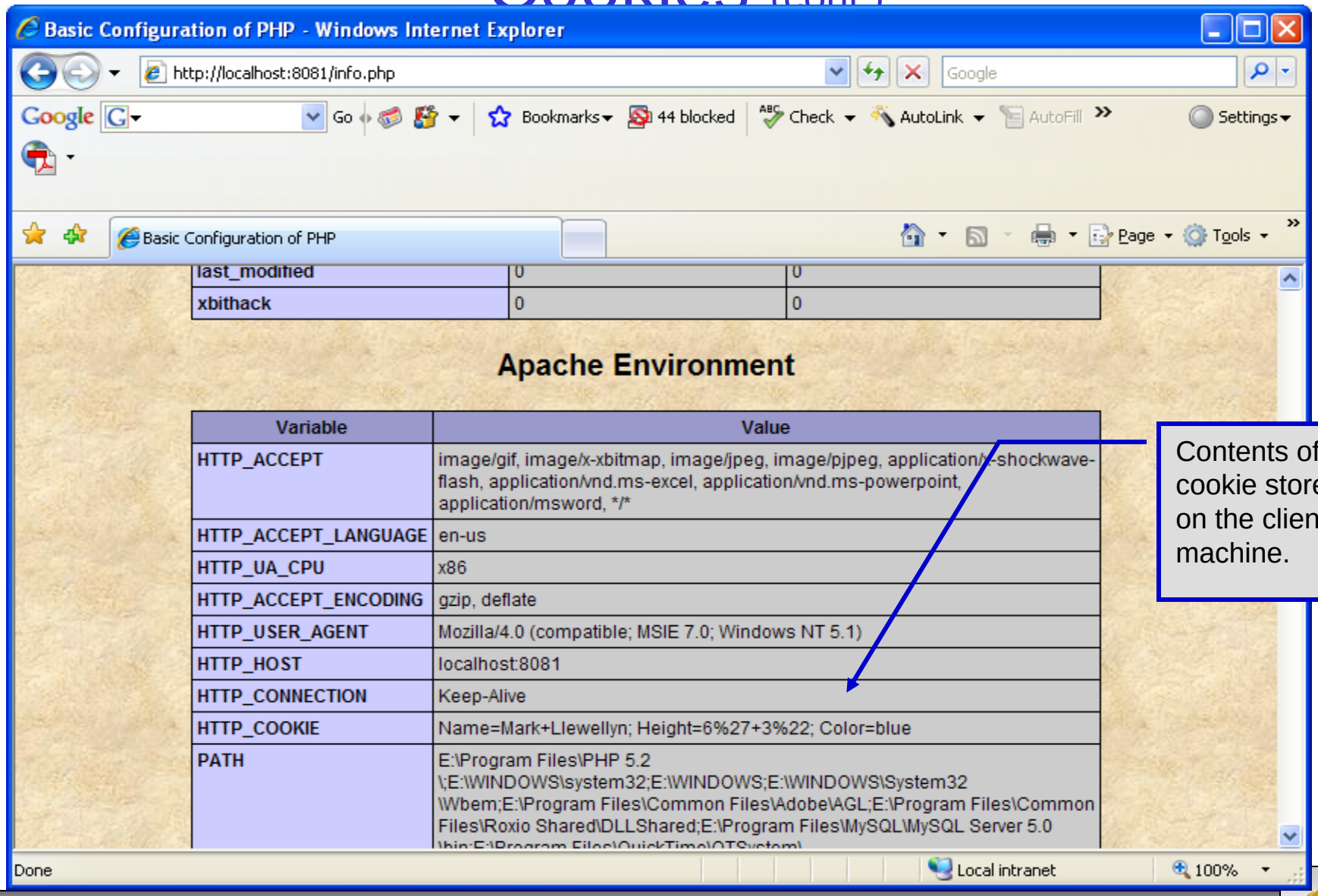
```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<!-- readCookies.php                    -->
<!-- Program to read cookies from the client's computer -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head><title>Read Cookies</title></head>

  <body style = "font-family: arial, sans-serif" background=image1.jpg>
    <p>
      <strong>   The following data is saved in a cookie on your computer.
     </strong>
    </p>
    <table border = "5" cellspacing = "0" cellpadding = "10">

      <?php
        // iterate through array $_COOKIE and print
        // name and value of each cookie
        foreach ( $_COOKIE as $key => $value )
          print( "<tr>
            <td bgcolor=\"#F0E68C\">$key</td>
            <td bgcolor=\"#FFA500\">$value</td>
            </tr>" );
      ?>
    </table>
  </body>  </html>
```

Superglobal array holding cookie.

Cookies (cont.)

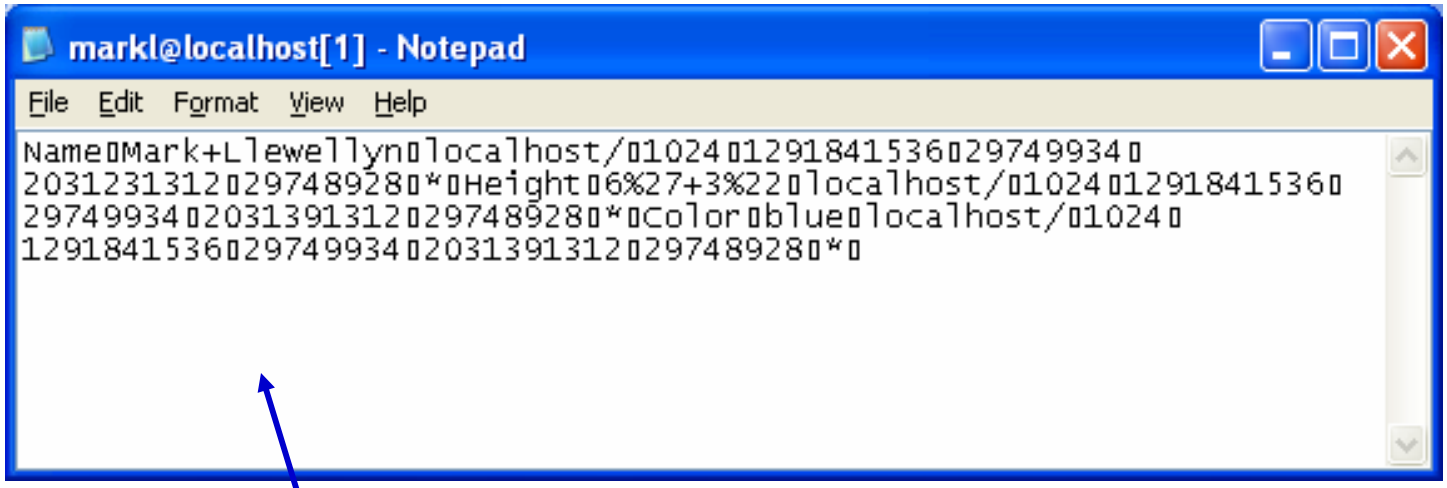


Cookies (cont.)



Contents of the cookie stored on the client machine.

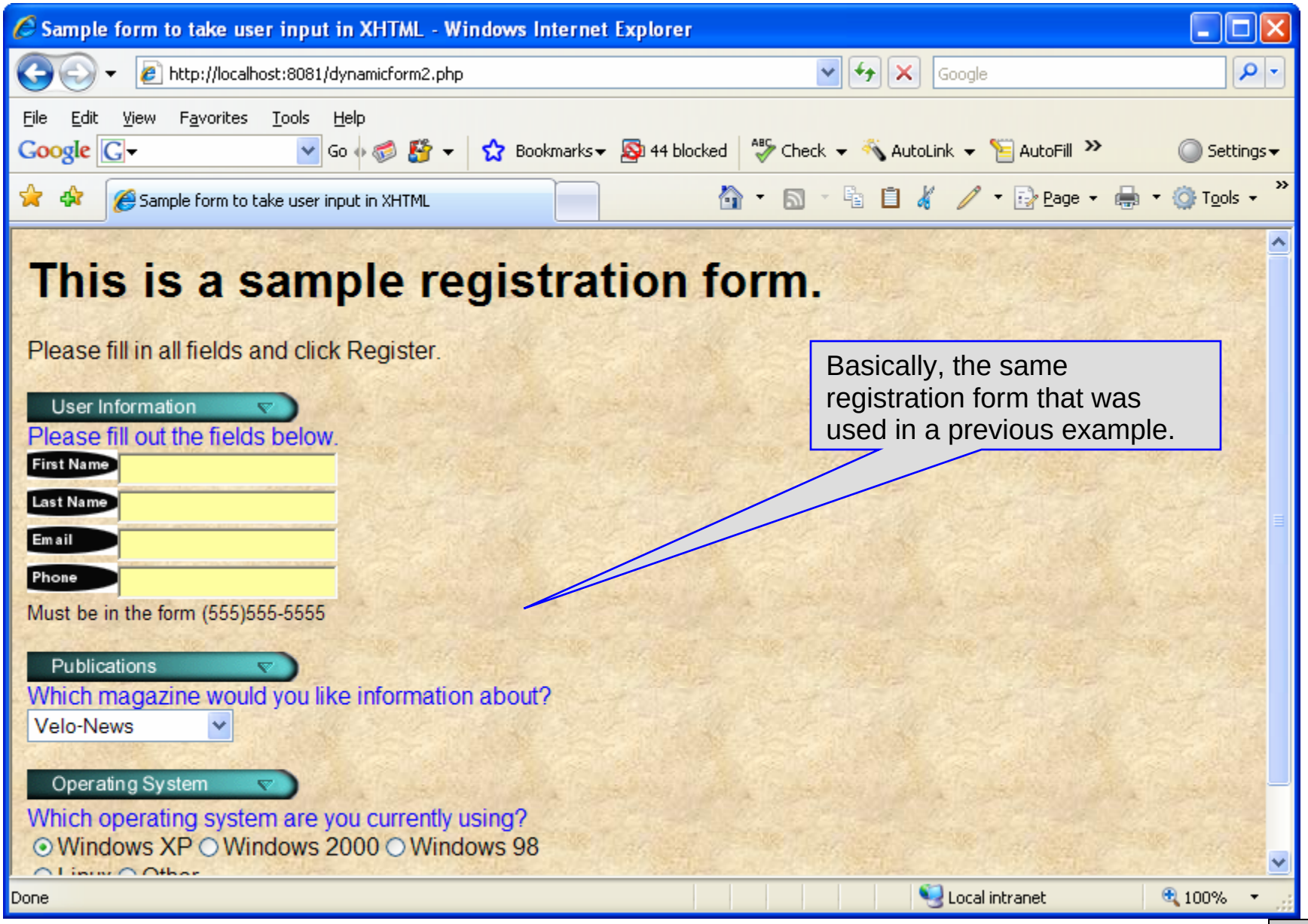
Cookies (cont.)

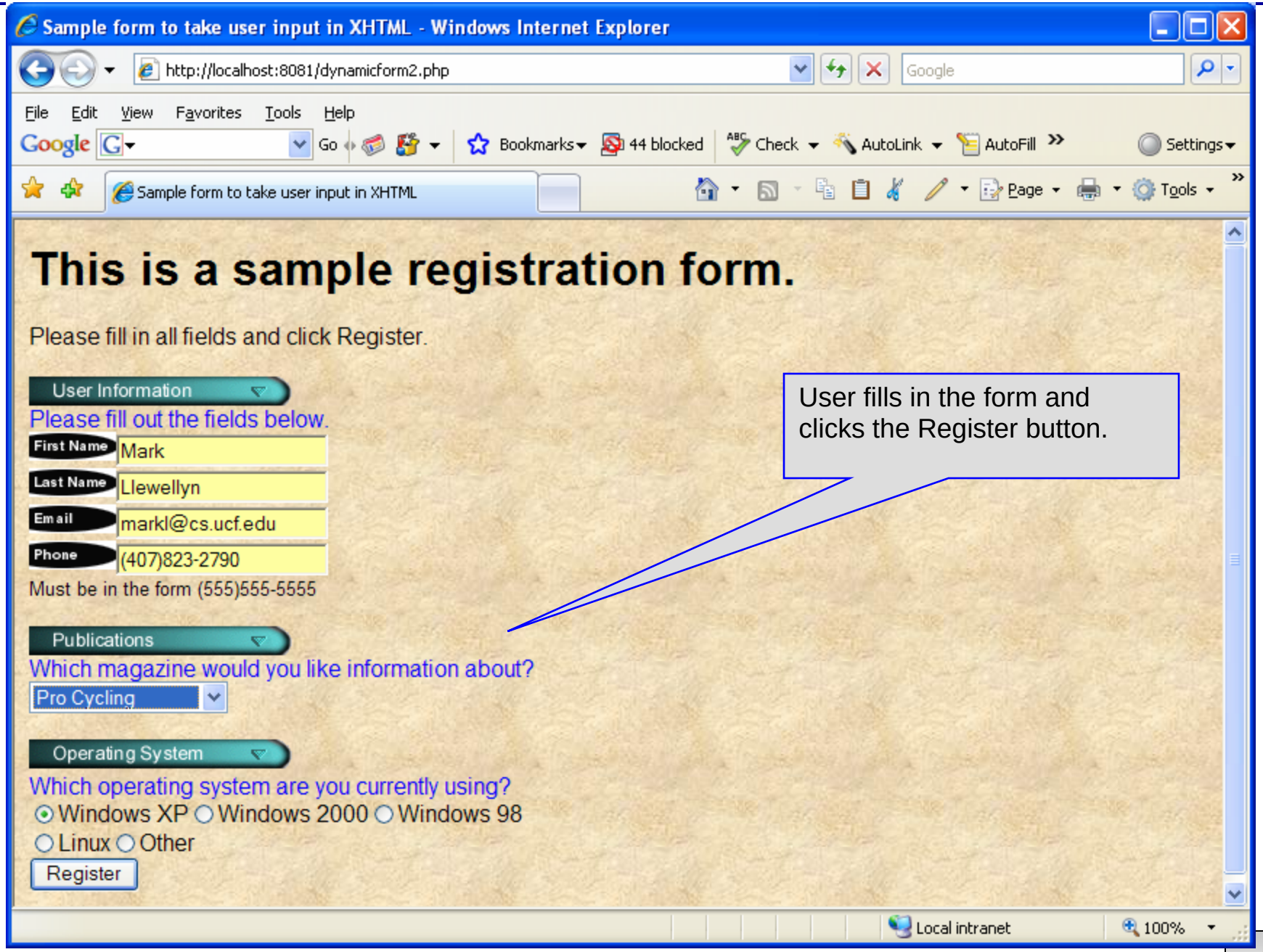


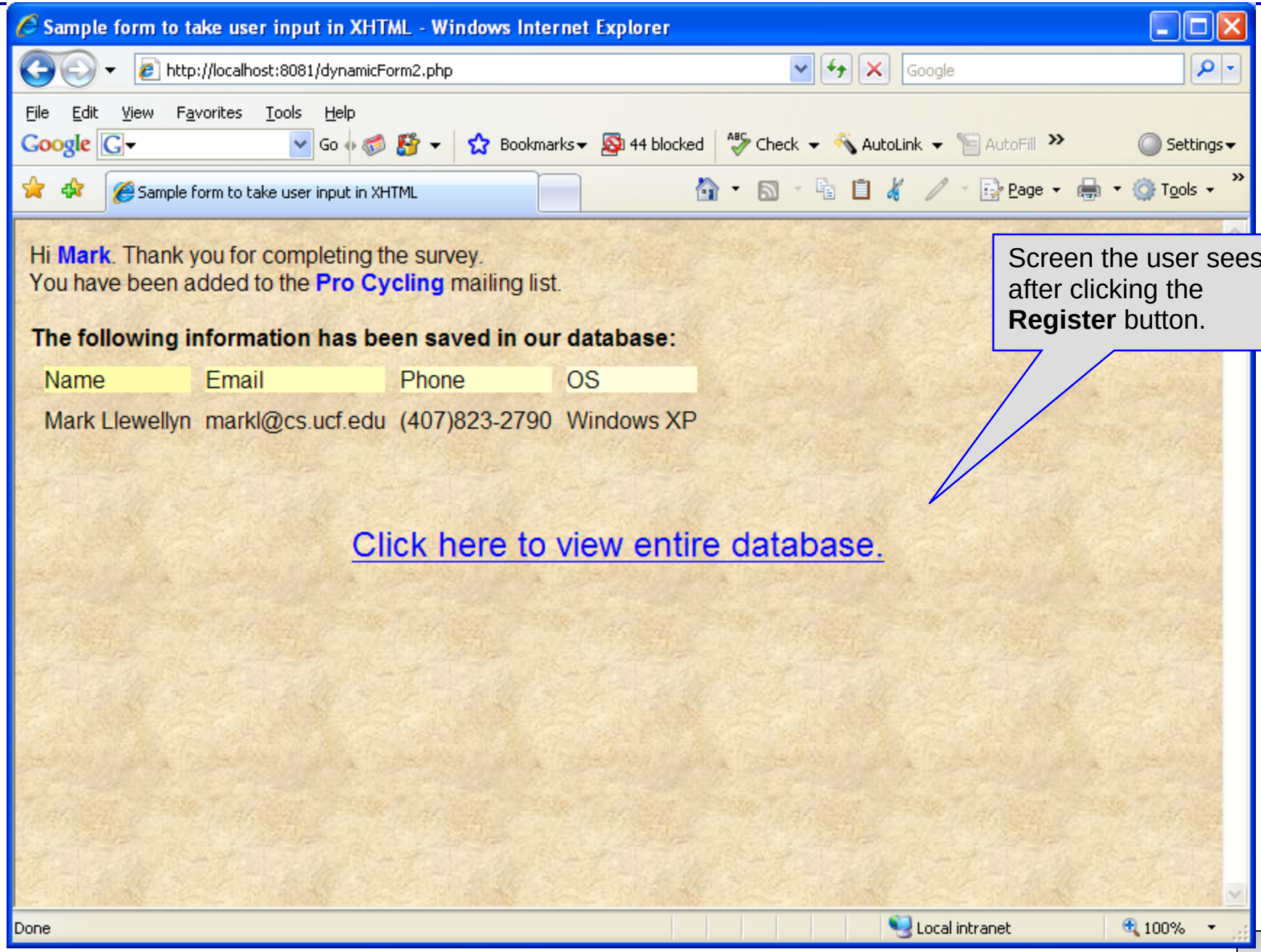
Actual text file holding cookie data for the cookie that was created in this example.

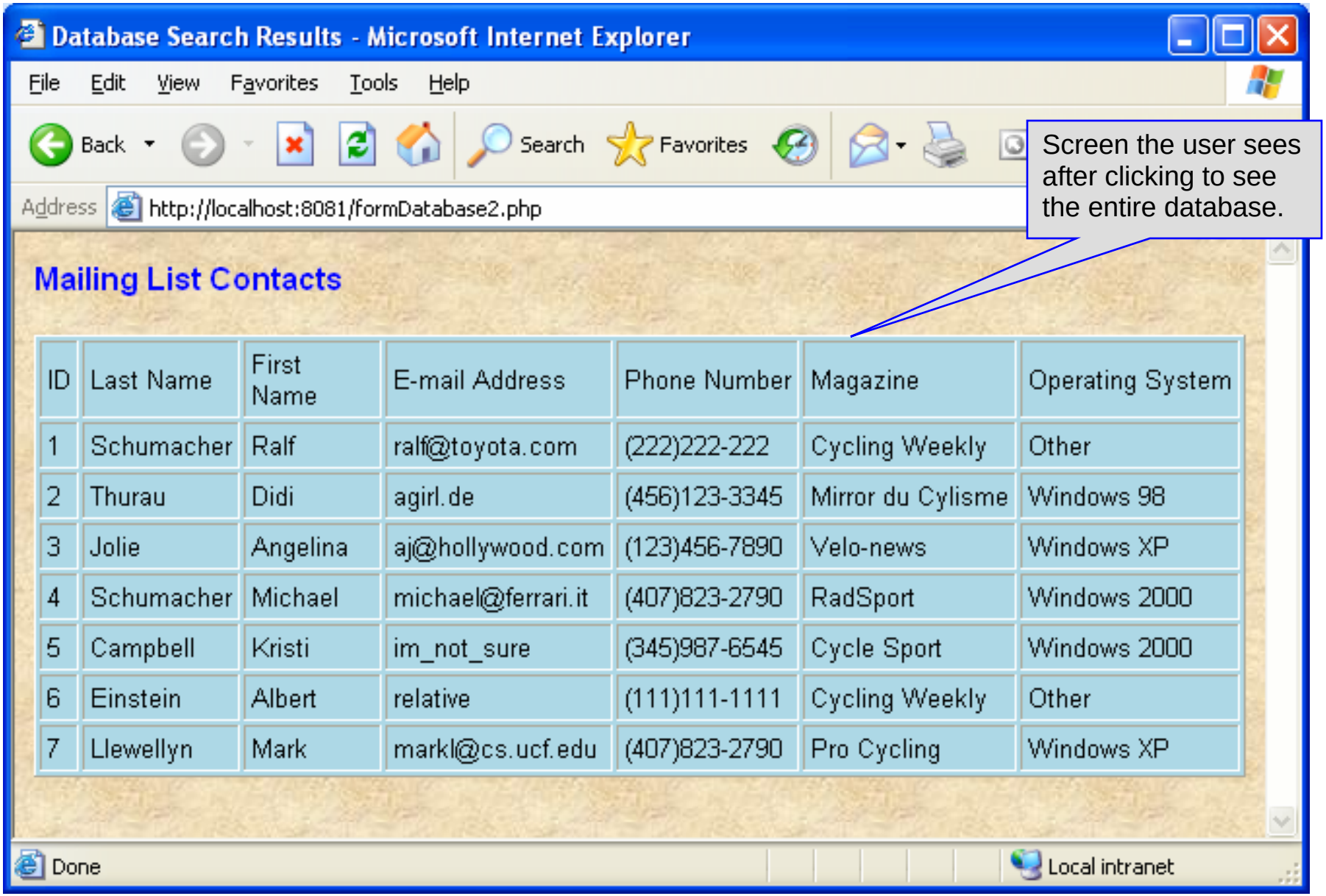
Dynamic Content in PHP

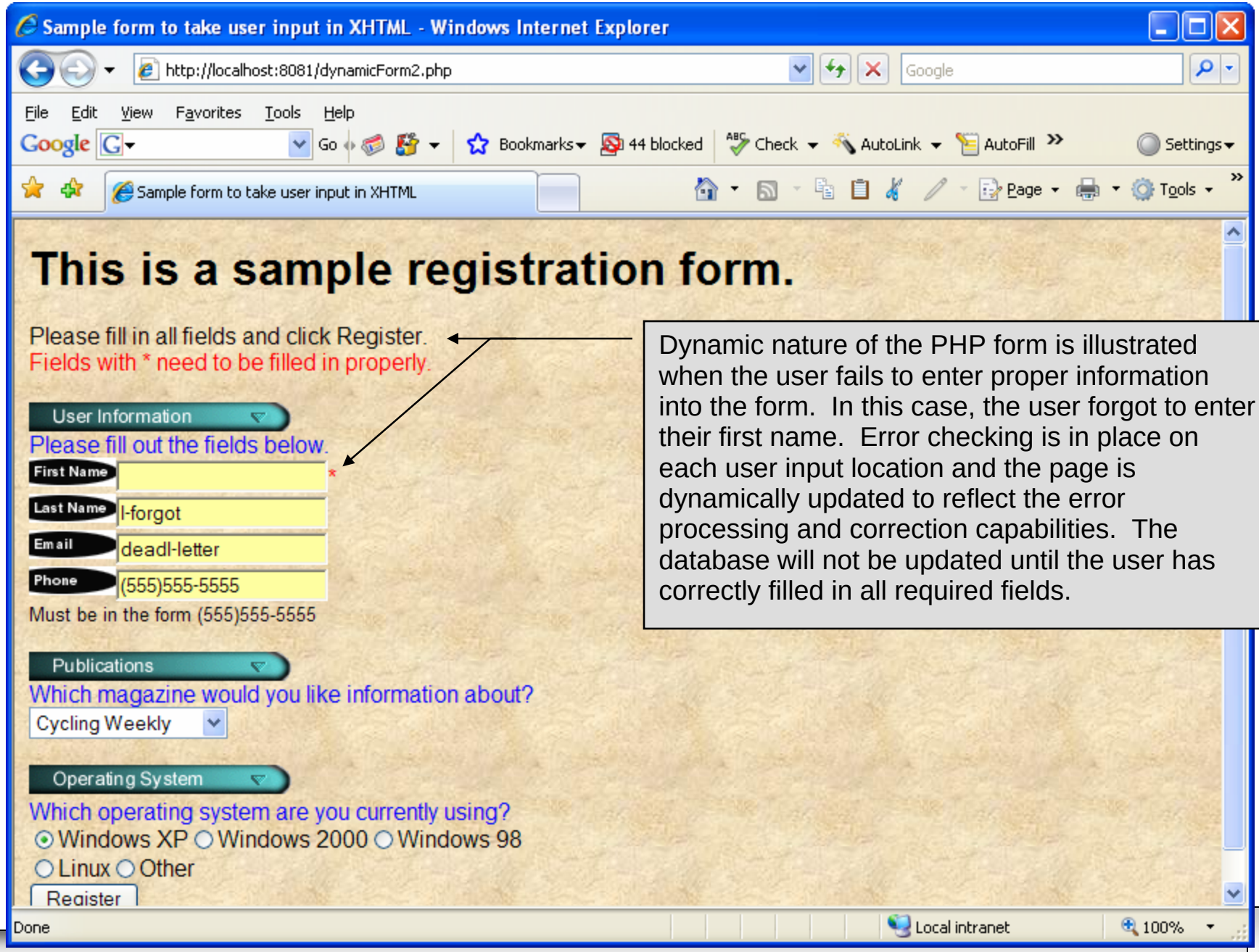
- Of all the strengths PHP exhibits as a server-side scripting language, perhaps its greatest strength lies in its ability to dynamically change XHTML output based on user input.
- In this final section of notes, we'll build on the examples we've constructed in the previous two sets of notes by combining `form.html` and `form.php` into one dynamic PHP document named `dynamicForm2.php`.
- We'll add error checking to the user input fields and inform the user of invalid entries on the form itself, rather than on an error page. If an error exists, the script maintains the previously submitted values in each form element.
- Finally, after the form has been successfully completed, we'll store the input from the user in a MySQL database.


Sample form to take user input in XHTML - Windows Internet Explorer
http://localhost:8081/dynamicform2.php
Google
File Edit View Favorites Tools Help
Bookmarks 44 blocked Check AutoLink AutoFill Settings
Sample form to take user input in XHTML
Page Tools
This is a sample registration form.
Please fill in all fields and click Register.
User Information
Please fill out the fields below.
First Name
Last Name
Email
Phone
Must be in the form (555)555-5555
Basically, the same registration form that was used in a previous example.
Publications
Which magazine would you like information about?
Velo-News
Operating System
Which operating system are you currently using?
Windows XP Windows 2000 Windows 98
Done
Local intranet
100%

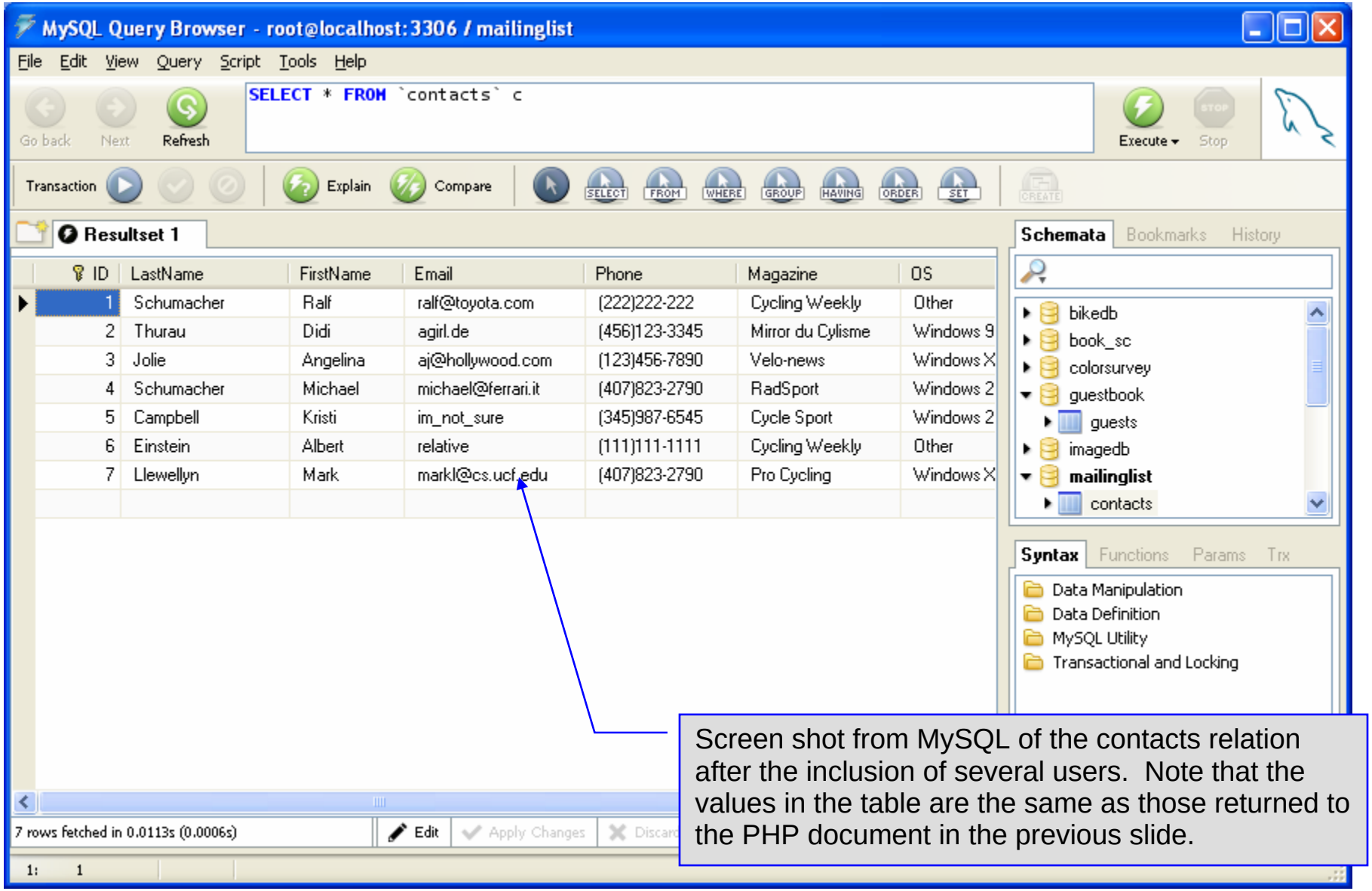

Sample form to take user input in XHTML - Windows Internet Explorer
http://localhost:8081/dynamicform2.php
Sample form to take user input in XHTML
This is a sample registration form.
Please fill in all fields and click Register.
User Information
Please fill out the fields below.
First Name
Mark
Last Name
Llewellyn
Email
markl@cs.ucf.edu
Phone
(407)823-2790
Must be in the form (555)555-5555
Publications
Which magazine would you like information about?
Pro Cycling
Operating System
Which operating system are you currently using?
Windows XP
Windows 2000
Windows 98
Linux
Other
Register
User fills in the form and clicks the Register button.


Sample form to take user input in XHTML - Windows Internet Explorer
http://localhost:8081/dynamicForm2.php
Google
File Edit View Favorites Tools Help
Google Go Bookmarks 44 blocked Check AutoLink AutoFill Settings
Sample form to take user input in XHTML
Page Tools
Hi Mark. Thank you for completing the survey.
You have been added to the Pro Cycling mailing list.
The following information has been saved in our database:
Name Email Phone OS
Mark Llewellyn markl@cs.ucf.edu (407)823-2790 Windows XP
Click here to view entire database.
Screen the user sees after clicking the Register button.
Done
Local intranet
100%


Database Search Results - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:8081/formDatabase2.php
Screen the user sees after clicking to see the entire database.
Mailing List Contacts
ID | Last Name | First Name | E-mail Address | Phone Number | Magazine | Operating System
1 | Schumacher | Ralf | ralf@toyota.com | (222)222-222 | Cycling Weekly | Other
2 | Thurau | Didi | agirl.de | (456)123-3345 | Mirror du Cylisme | Windows 98
3 | Jolie | Angelina | aj@hollywood.com | (123)456-7890 | Velo-news | Windows XP
4 | Schumacher | Michael | michael@ferrari.it | (407)823-2790 | RadSport | Windows 2000
5 | Campbell | Kristi | im_not_sure | (345)987-6545 | Cycle Sport | Windows 2000
6 | Einstein | Albert | relative | (111)111-1111 | Cycling Weekly | Other
7 | Llewellyn | Mark | markl@cs.ucf.edu | (407)823-2790 | Pro Cycling | Windows XP
Done
Local intranet



Dynamic nature of the PHP form is illustrated when the user fails to enter proper information into the form. In this case, the user forgot to enter their first name. Error checking is in place on each user input location and the page is dynamically updated to reflect the error processing and correction capabilities. The database will not be updated until the user has correctly filled in all required fields.



Screen shot from MySQL of the contacts relation after the inclusion of several users. Note that the values in the table are the same as those returned to the PHP document in the previous slide.

dynamicForm2.php – page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<!-- dynamicForm2.php          -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>Sample form to take user input in XHTML</title>
</head>
<body style = "font-family: arial, sans-serif;  background-color: #856363"
background=background.jpg>
  <?php
    extract ( $_POST );
    $iserror = false;
    // array of magazine titles
    $maglist = array( "Velo-News",
      "Cycling Weekly",
      "Pro Cycling",
      "Cycle Sport",
              "RadSport",
              "Mirror du Cyclisme" );
    // array of possible operating systems
    $systemlist = array( "Windows XP",
      "Windows 2000",
      "Windows 98",
      "Linux",
      "Other");
```


```
// array of name and alt values for the text input fields
      $inputlist = array( "fname" => "First Name",
        "lname" => "Last Name",
        "email" => "Email",
        "phone" => "Phone" );
      if ( isset ( $submit ) ) {
        if ( $fname == "" ) {
          $formerrors[ "fnameerror" ] = true;
          $iserror = true;
        }
        if ( $lname == "" ) {
          $formerrors[ "lnameerror" ] = true;
          $iserror = true;
        }
        if ( $email == "" ) {
          $formerrors[ "emailerror" ] = true;
          $iserror = true;
        }
        if ( !ereg( "^\([0-9]{3}\)[0-9]{3}-[0-9]{4}$", $phone ) ) {
          $formerrors[ "phoneerror" ] = true;
          $iserror = true;
        }
        if ( !$iserror ) {
          // build INSERT query
          $query = "INSERT INTO contacts " .
            "(ID, LastName, FirstName, Email, Phone, Magazine, OS ) " .
            "VALUES (null, '$lname', '$fname', '$email', " .  "'" . quotemeta( $phone ) . "', '$mag', '$os' )";
```


```
// Connect to MySQL
 if ( !( $database = mysql_connect( "localhost",
    "root", "root" ) ) )
    die( "Could not connect to database" );

 // open MailingList database
 if ( !mysql_select_db( "MailingList", $database ) )
    die( "Could not open MailingList database" );

 // execute query in MailingList database
 if ( !( $result = mysql_query( $query, $database ) ) ) {
    print( "Could not execute query! <br />" );
    die( mysql_error() );
 }
 print( "<p>Hi
    <span style = 'color: blue'> <strong>$fname</strong></span>.
    Thank you for completing the survey.<br />
    You have been added to the <span style = 'color: blue'>
    <strong>$mag</strong></span> mailing list.              </p>
    <strong>The following information has been saved in our database:</strong><br />

    <table border = '0' cellpadding = '0' cellspacing = '10'>
    <tr>
    <td bgcolor = '#ffffaa'>Name </td>
    <td bgcolor = '#ffffbb'>Email</td>
    <td bgcolor = '#ffffcc'>Phone</td>
    <td bgcolor = '#ffffdd'>OS</td>
    </tr>
    <tr>
```


```
        <!-- print each form field's value -->
        <td>$fname $lname</td>
        <td>$email</td>
        <td>$phone</td>
        <td>$os</td>
        </tr></table>
        <br /><br /><br />
        <div style = 'font-size : 10pt; text-align: center'>
                                    <div style = 'font-size : 18pt'>
                                    <a href = 'formDatabase2.php'>
                                    Click here to view entire database.</a>
                                    </div>
          </div></body></html>" );
      die();
    }
}
print( "<h1>This is a sample registration form.</h1>
   Please fill in all fields and click Register." );
if ( $iserror ) {
   print( "<br /><span style = 'color : red'>
      Fields with * need to be filled in properly.</span>" );
}
print( "<!-- post form data to dynamicForm2.php -->
   <form method = 'post' action = 'dynamicForm2.php'>
   <img src = 'images/user.gif' alt = 'User' /><br />
   <span style = 'color: blue'>
   Please fill out the fields below.<br />
   </span>
```

Invoke PHP script to see contents of entire database if user clicks this link. Code begins on page 14.

The form created is self-submitting (i.e., it posts to itself). This is done by setting the action to dynamicForm2.php

dynamicForm2.php – page 5

```
<!-- create four text boxes for user input -->" );
 foreach ( $inputlist as $inputname => $inputalt ) {
    $inputtext = $inputvalues[ $inputname ];

    print( "<img src = 'images/$inputname.gif'
       alt = '$inputalt' /><input type = 'text'  name = '$inputname' value = '" . $$inputname . "' />" );
    if ( $formerrors[ ( $inputname )."error" ] == true )
       print( "<span style = 'color : red'>*</span>" );
    print( "<br />" );
 }
 print( "<span style = 'font-size : 10pt" );
 if ( $formerrors[ "phoneerror" ] )  print( "; color : red" );
 print( "'>Must be in the form (555)555-5555
    </span><br /><br />
    <img src = 'images/downloads.gif'
    alt = 'Publications' /><br />
    <span style = 'color: blue'>
    Which magazine would you like information about?
    </span><br />
    <!-- create drop-down list containing magazine names -->
    <select name = 'mag'>" );
 foreach ( $maglist as $currmag ) {
    print( "<option" );
    if ( ( $currmag == $mag ) )
       print( " selected = 'true'" );
    print( ">$currmag</option>" );
 }
```

The $$variable notation specifies variable variables. PHP permits the use of variable variables to allow developers to reference variables dynamically.
The expression $$variable could also be written as ${$variable} for added clarity.

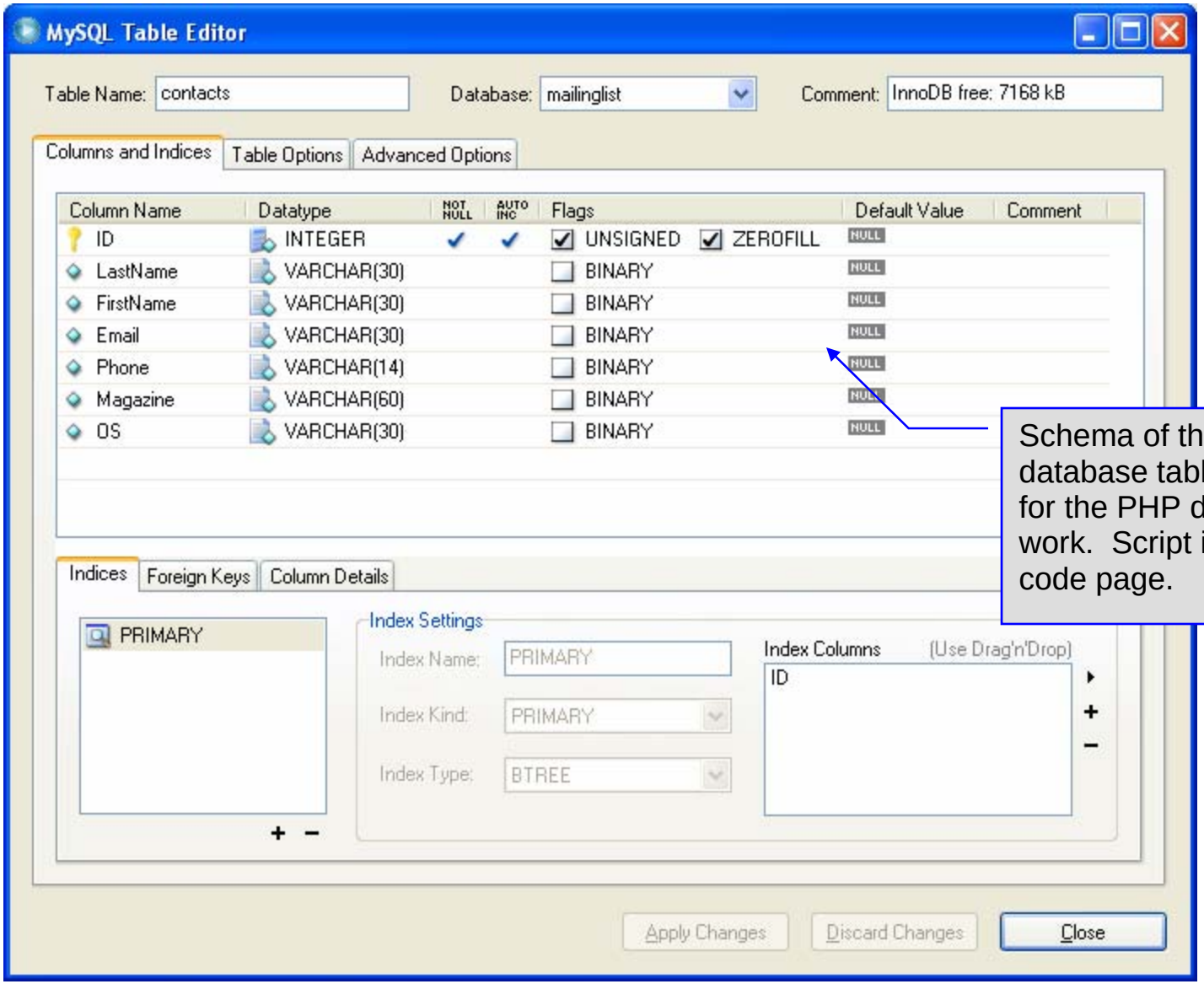
```
    print( "</select><br /><br />
    <img src = 'images/os.gif' alt = 'Operating System' />
    <br /><span style = 'color: blue'>
    Which operating system are you currently using?
    <br /></span>

    <!-- create five radio buttons -->" );

$counter = 0;

foreach ( $systemlist as $currsystem ) {
    print( "<input type = 'radio' name = 'os'
       value = '$currsystem'" );

    if ( $currsystem == $os ) print( "checked = 'checked'" );
    if ( iserror && $counter == 0 ) print( "checked = 'checked'" );

    print( " />$currsystem" );

    if ( $counter == 2 ) print( "<br />" );
    $counter++;
}

print( "<!-- create a submit button -->
    <br />
    <input type = 'submit' name = 'submit' value = 'Register' />
    </form></body></html>" );
?>
```


formDatabase2.php – page 1

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<!– formDatabase2.php       -->
<!-- Program to query a database and send results to the client.     -->

<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>     <title>Database Search Results</title>   </head>
  <body style = "font-family: arial, sans-serif"
    style = "background-color: #F0E68C" background=image1.jpg>
    <?php
      extract( $_POST );
      // build SELECT query
      $query = "SELECT * FROM contacts";
            // Connect to MySQL
      if ( !( $database = mysqli_connect( "localhost",  "root", "root“, MailingList ) ) )
        die( "Could not connect to database" );
       // query MailingList database
      if ( !( $result = mysqli_query( $database, $query ) ) ) {
        print( "Could not execute query! <br />" );
        die( mysqli_error() );
      }
    ?>
    <h3 style = "color: blue">
    Mailing List Contacts</h3>
```


formDatabase2.php – page 2

```
<table border = "1" cellpadding = "3" cellspacing = "2"
 style = "background-color: #ADD8E6">
 <tr>
   <td>ID</td>
   <td>Last Name</td>
   <td>First Name</td>
   <td>E-mail Address</td>
   <td>Phone Number</td>
   <td>Magazine</td>
   <td>Operating System</td>
 </tr>
 <?php
   // fetch each record in result set
   for ( $counter = 0;
     $row = mysqli_fetch_row( $result );
     $counter++ ){
     // build table to display results
     print( "<tr>" );
     foreach ( $row as $key => $value )
       print( "<td>$value</td>" );
     print( "</tr>" );
   }
   mysqli_close( $database );
 ?>

  </table>
 </body>
</html>
```

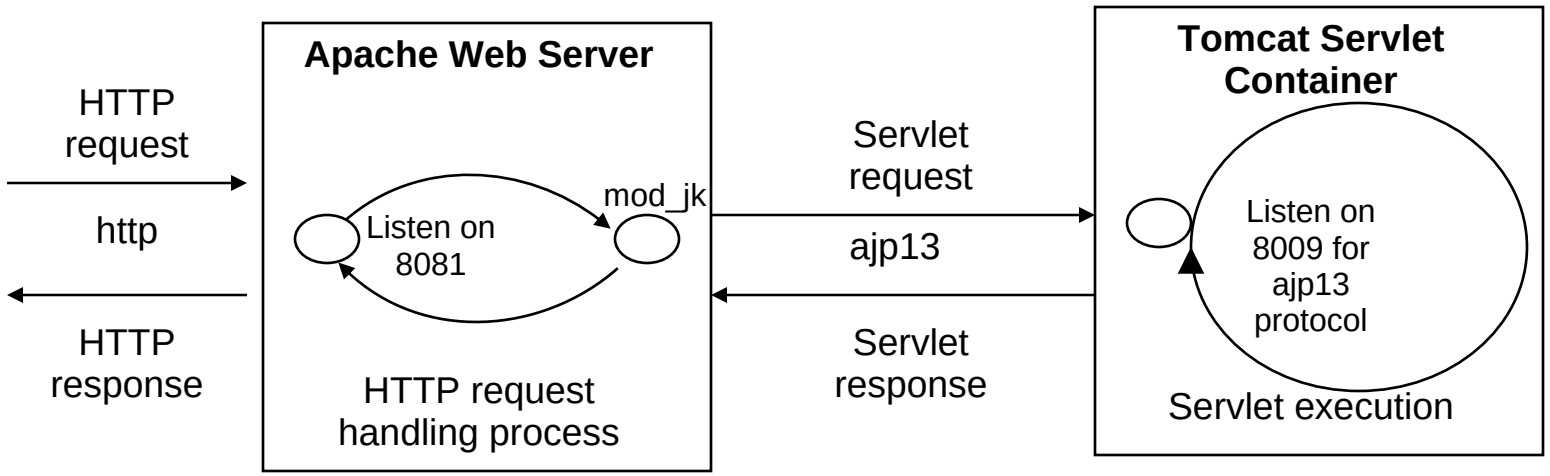
Schema of the MailingList database table contacts required for the PHP database example to work. Script is available on the code page.

Connecting Apache To Tomcat

- Although it is possible for Tomcat to run standalone and serve HTTP requests directly (we did this for servlets and jsps), the Apache server does a much better job of handling tasks such as static content and SSL connections.
- For this reason, Tomcat is typically used alongside an Apache server. Unlike PHP which runs as a module inside the Apache process, a JVM is external and requires a mechanism to connect it to the web server.
- Tomcat inherited the Apache JServ protocol (AJP) from the JServ project. AJP is a protocol for connecting an external process to a servlet container. It is the responsibility of an Apache module, in this case `mod_jk`, to speak this protocol to the servlet container (Tomcat).

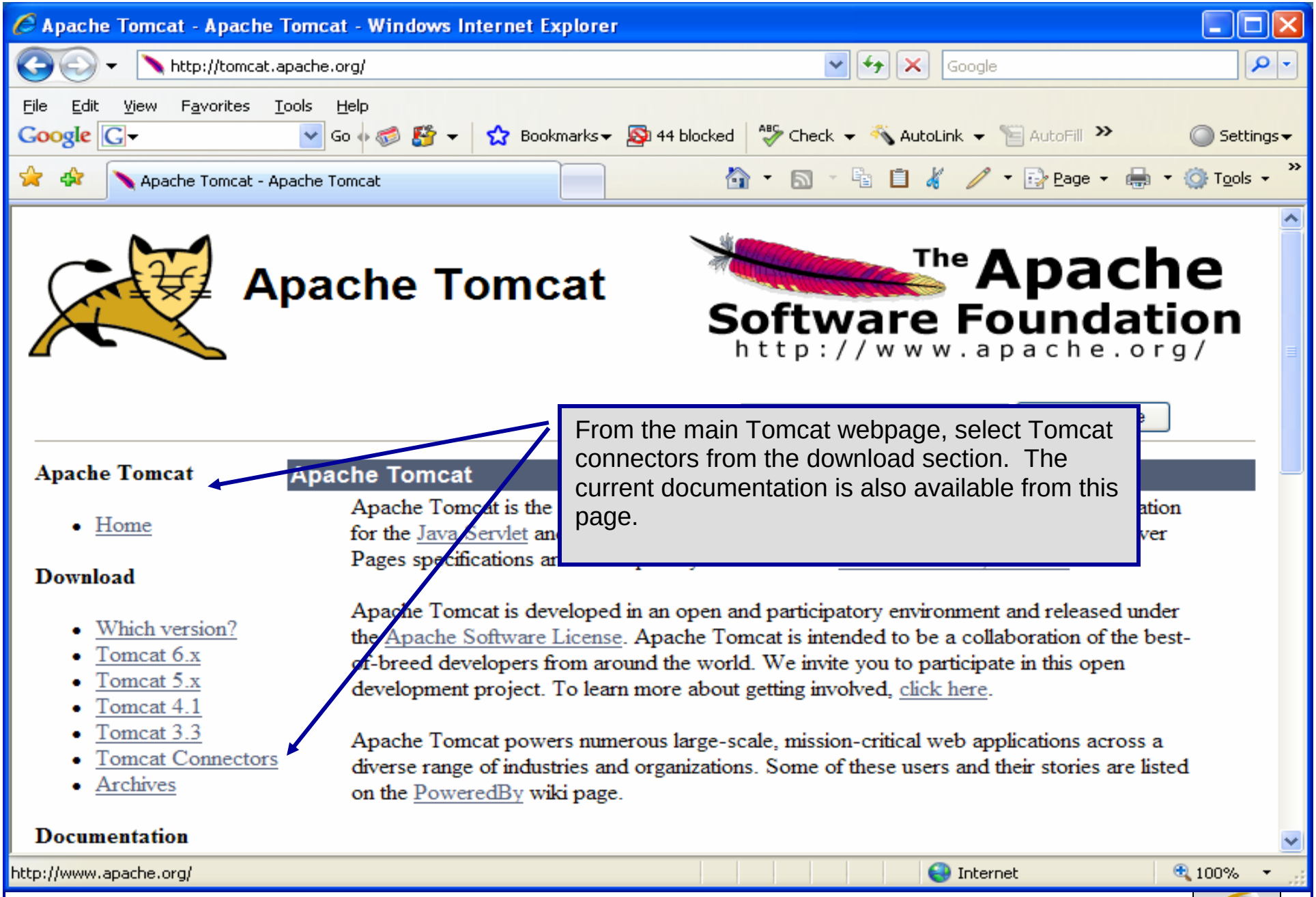
Connecting Apache To Tomcat (cont.)

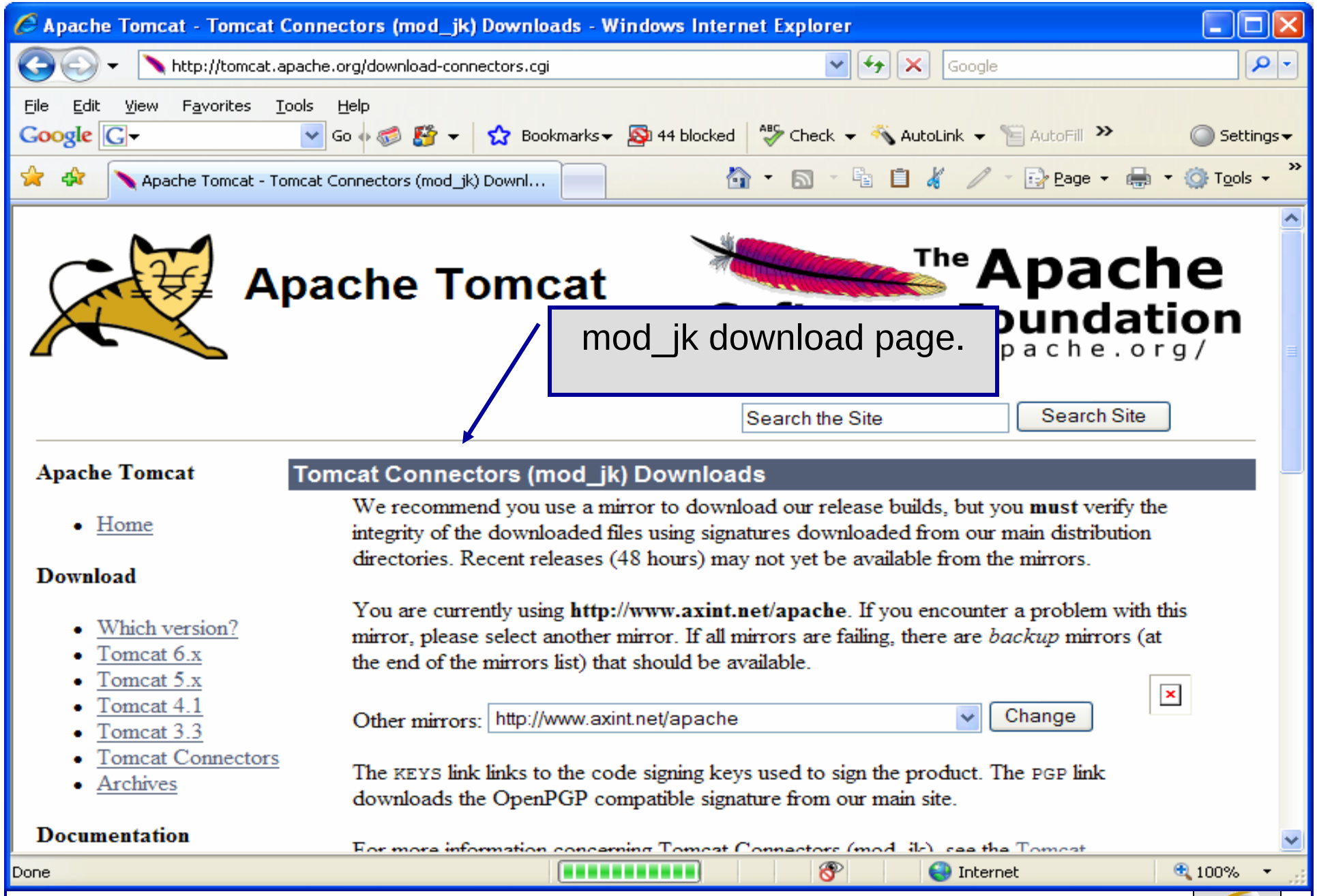
- In this last section of notes, I'll show you how to integrate Apache and Tomcat into a single package.
- The ultimate set-up will resemble the figure shown below. Note that if you also would like Tomcat to run standalone HTTP requests, it will need to run on a different HTTP port than Apache. That's why I set-up Apache on port 8081 and Tomcat on port 8080.



Getting The Tomcat Connector

- The first step in Apache-Tomcat integration is to obtain the Tomcat connector from Apache.
- Follow the screen shots on the next few pages to obtain the `mod_jk` connector.
- The Windows based connector binary files has the name `mod_jk-apache-2.2.4.so`.


Apache Tomcat - Apache Tomcat - Windows Internet Explorer
http://tomcat.apache.org/
Apache Tomcat - Apache Tomcat
Apache Tomcat
The Apache Software Foundation
http://www.apache.org/
Apache Tomcat
Home
Download
Which version?
Tomcat 6.x
Tomcat 5.x
Tomcat 4.1
Tomcat 3.3
Tomcat Connectors
Archives
Documentation
Apache Tomcat
Apache Tomcat is the
for the Java Servlet an
Pages specifications ar
Apache Tomcat is developed in an open and participatory environment and released under the Apache Software License. Apache Tomcat is intended to be a collaboration of the best-of-breed developers from around the world. We invite you to participate in this open development project. To learn more about getting involved, click here.
Apache Tomcat powers numerous large-scale, mission-critical web applications across a diverse range of industries and organizations. Some of these users and their stories are listed on the PoweredBy wiki page.
From the main Tomcat webpage, select Tomcat connectors from the download section. The current documentation is also available from this page.
http://www.apache.org/
Internet
100%


Apache Tomcat - Tomcat Connectors (mod_jk) Downloads - Windows Internet Explorer
http://tomcat.apache.org/download-connectors.cgi
Apache Tomcat - Tomcat Connectors (mod_jk) Downl...
Apache Tomcat
The Apache Software Foundation
http://www.apache.org/
mod_jk download page.
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Tomcat 6.x
Tomcat 5.x
Tomcat 4.1
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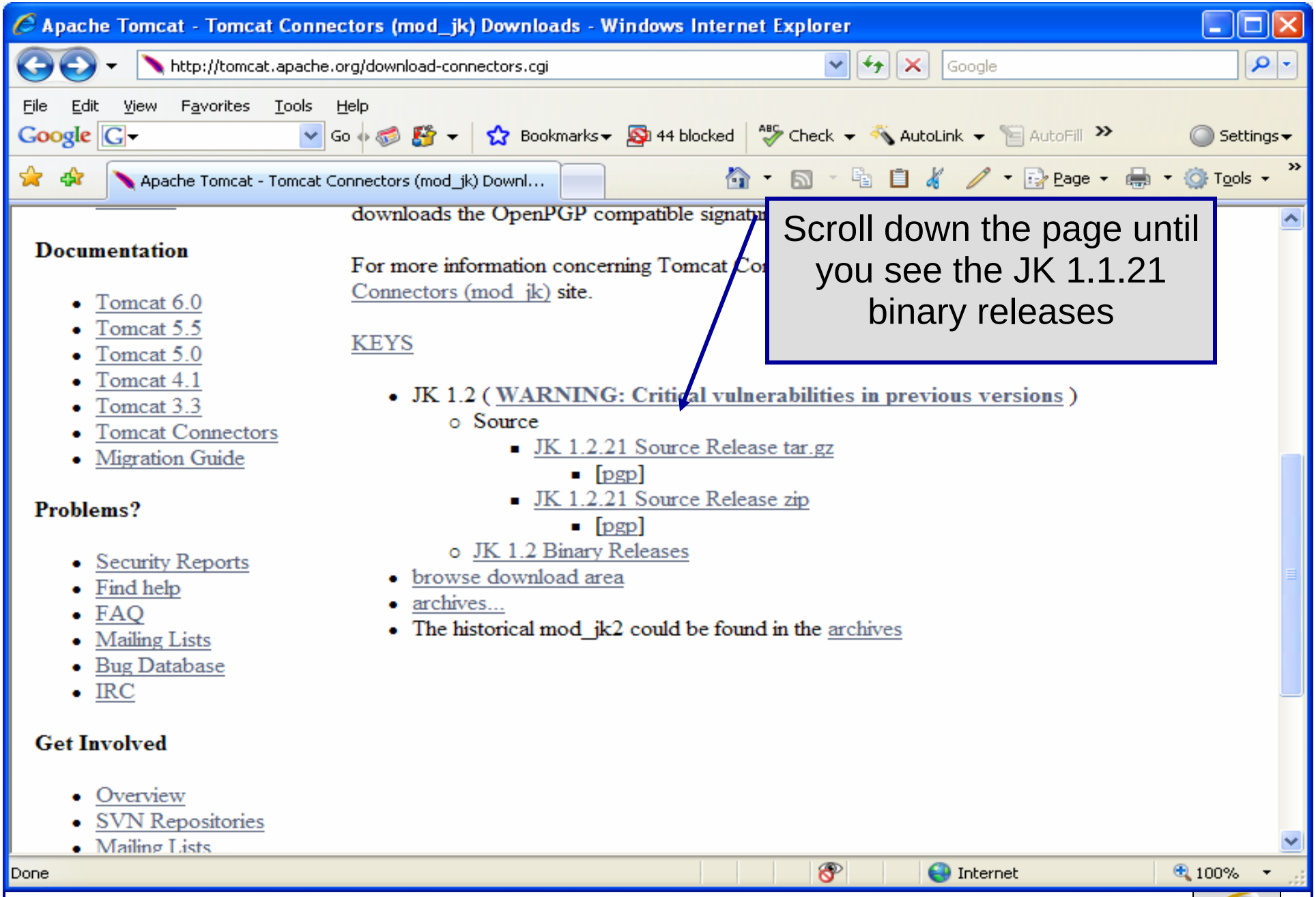
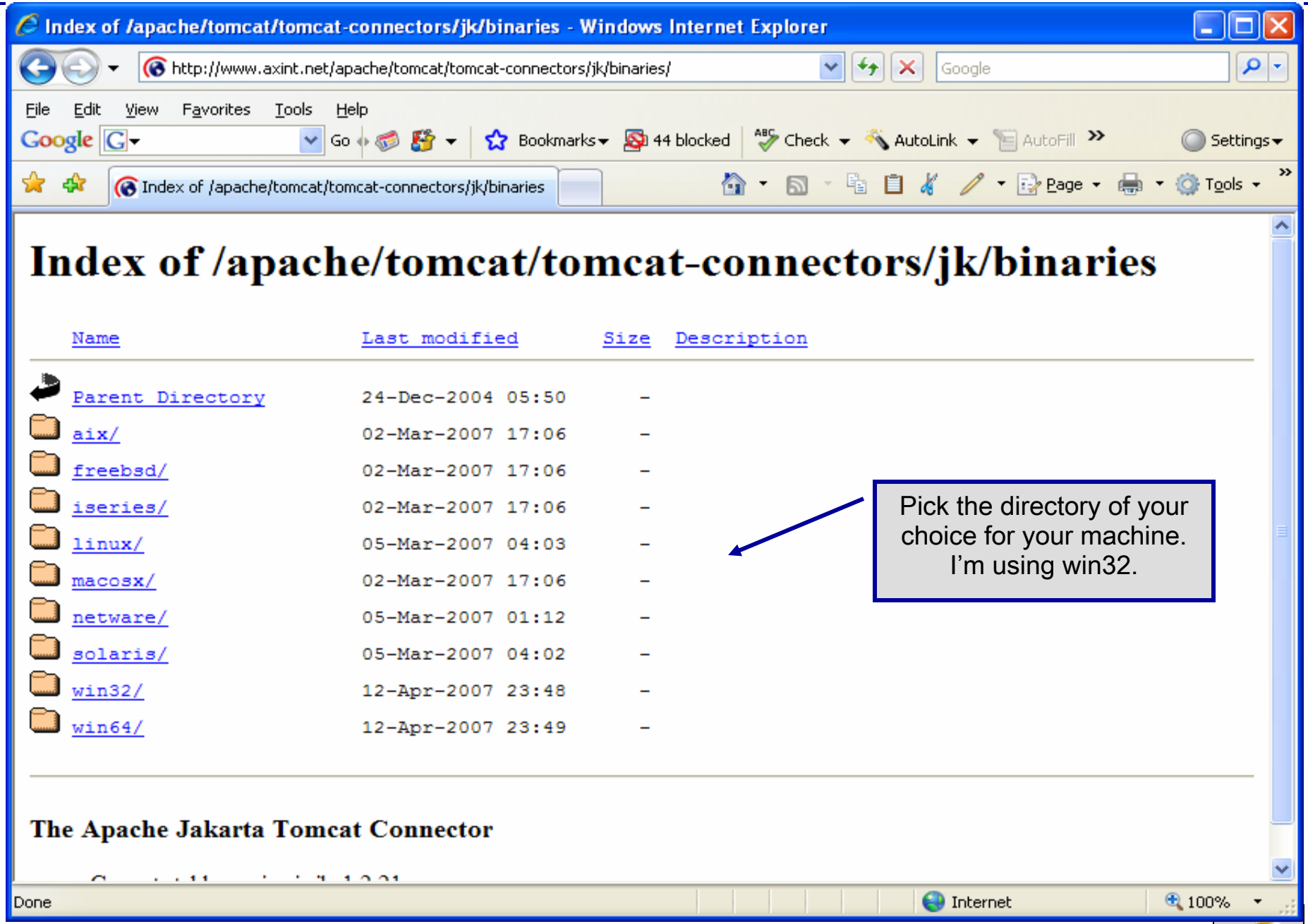
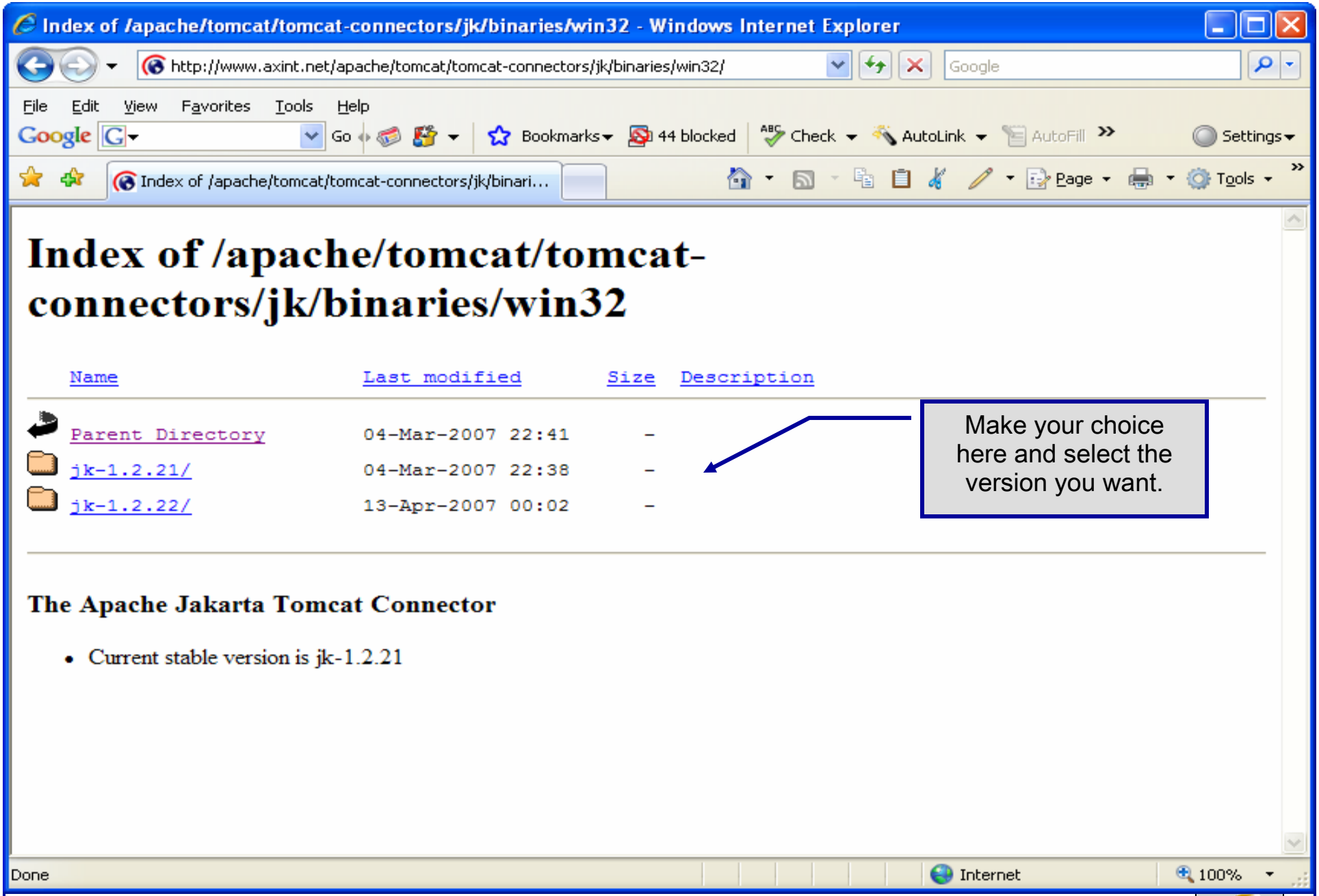
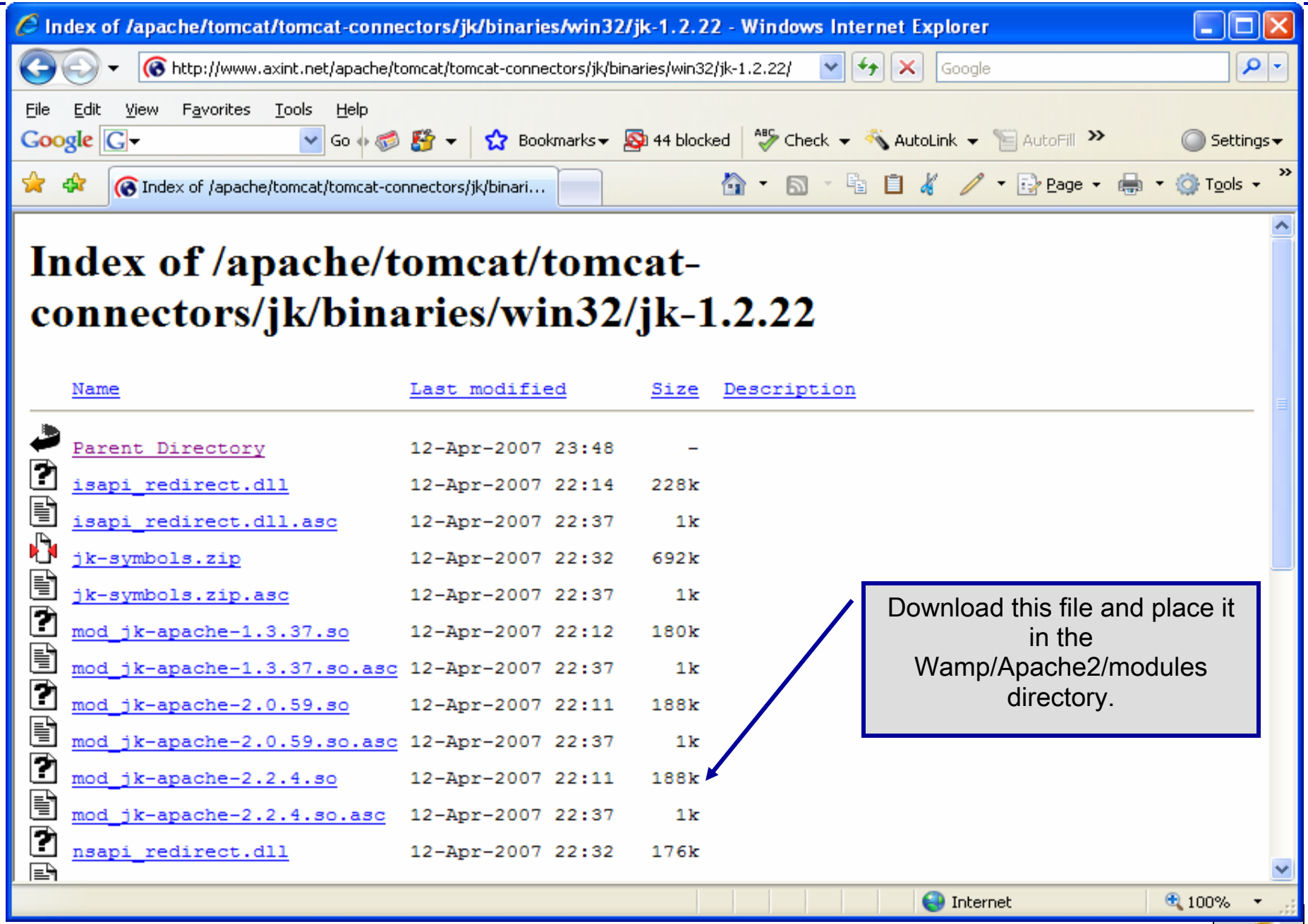
Tomcat Connectors
Archives
Documentation
Tomcat Connectors (mod_jk) Downloads
We recommend you use a mirror to download our release builds, but you must verify the integrity of the downloaded files using signatures downloaded from our main distribution directories. Recent releases (48 hours) may not yet be available from the mirrors.
You are currently using http://www.axint.net/apache. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are backup mirrors (at the end of the mirrors list) that should be available.
Other mirrors: http://www.axint.net/apache
Change
The KEYS link links to the code signing keys used to sign the product. The PGP link downloads the OpenPGP compatible signature from our main site.
Done
Internet
100%


Apache Tomcat - Tomcat Connectors (mod_jk) Downloads - Windows Internet Explorer
http://tomcat.apache.org/download-connectors.cgi
Apache Tomcat - Tomcat Connectors (mod_jk) Downl...
Documentation
Tomcat 6.0
Tomcat 5.5
Tomcat 5.0
Tomcat 4.1
Tomcat 3.3
Tomcat Connectors
Migration Guide
Problems?
Security Reports
Find help
FAQ
Mailing Lists
Bug Database
IRC
Get Involved
Overview
SVN Repositories
Mailing Lists
downloads the OpenPGP compatible signatu
For more information concerning Tomcat Co
Connectors (mod_jk) site.
KEYS
JK 1.2 (WARNING: Critical vulnerabilities in previous versions)
Source
JK 1.2.21 Source Release tar.gz
[pgp]
JK 1.2.21 Source Release zip
[pgp]
JK 1.2 Binary Releases
browse download area
archives...
The historical mod_jk2 could be found in the archives
Scroll down the page until you see the JK 1.1.21 binary releases
Done
Internet
100%

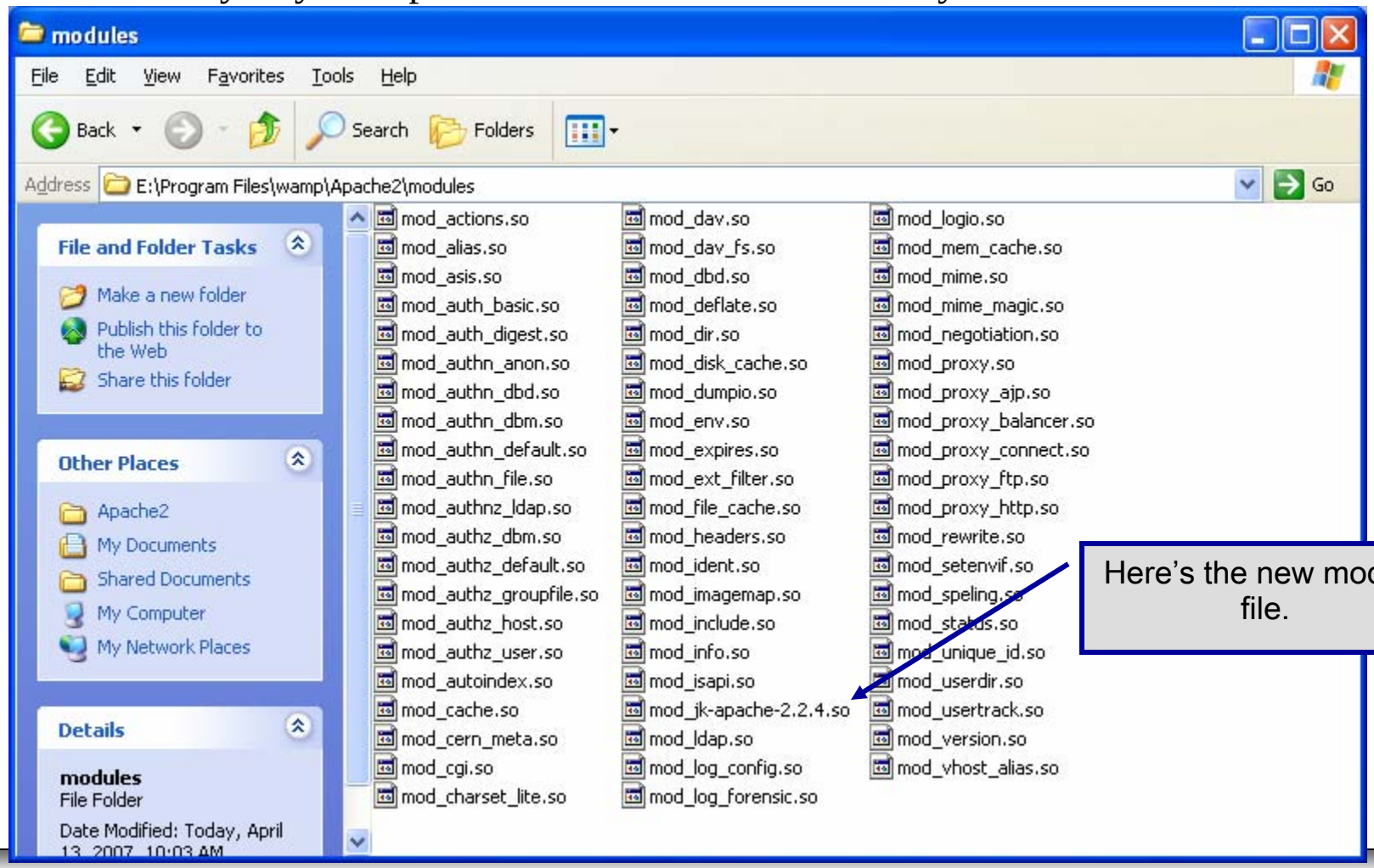

Index of /apache/tomcat/tomcat-connectors/jk/binaries - Windows Internet Explorer
http://www.axint.net/apache/tomcat/tomcat-connectors/jk/binaries/
File Edit View Favorites Tools Help
Index of /apache/tomcat/tomcat-connectors/jk/binaries
Index of /apache/tomcat/tomcat-connectors/jk/binaries
Name Last modified Size Description
Parent Directory 24-Dec-2004 05:50 -
aix/ 02-Mar-2007 17:06 -
freebsd/ 02-Mar-2007 17:06 -
iseries/ 02-Mar-2007 17:06 -
linux/ 05-Mar-2007 04:03 -
macosx/ 02-Mar-2007 17:06 -
netware/ 05-Mar-2007 01:12 -
solaris/ 05-Mar-2007 04:02 -
win32/ 12-Apr-2007 23:48 -
win64/ 12-Apr-2007 23:49 -
The Apache Jakarta Tomcat Connector
Pick the directory of your choice for your machine. I'm using win32.
Done
Internet
100%


Index of /apache/tomcat/tomcat-connectors/jk/binaries/win32 - Windows Internet Explorer
http://www.axint.net/apache/tomcat/tomcat-connectors/jk/binaries/win32/
Google
File Edit View Favorites Tools Help
Bookmarks 44 blocked Check AutoLink AutoFill Settings
Index of /apache/tomcat/tomcat-connectors/jk/binari...
Page Tools
Index of /apache/tomcat/tomcat-connectors/jk/binaries/win32
Name Last modified Size Description
Parent Directory 04-Mar-2007 22:41 -
jk-1.2.21/ 04-Mar-2007 22:38 -
jk-1.2.22/ 13-Apr-2007 00:02 -
Make your choice here and select the version you want.
The Apache Jakarta Tomcat Connector
Current stable version is jk-1.2.21
Done
Internet
100%


Index of /apache/tomcat/tomcat-connectors/jk/binaries/win32/jk-1.2.22 - Windows Internet Explorer
http://www.axint.net/apache/tomcat/tomcat-connectors/jk/binaries/win32/jk-1.2.22/
File Edit View Favorites Tools Help
Index of /apache/tomcat/tomcat-connectors/jk/binari...
Index of /apache/tomcat/tomcat-connectors/jk/binaries/win32/jk-1.2.22
Name Last modified Size Description
Parent Directory 12-Apr-2007 23:48 -
isapi_redirect.dll 12-Apr-2007 22:14 228k
isapi_redirect.dll.asc 12-Apr-2007 22:37 1k
jk-symbols.zip 12-Apr-2007 22:32 692k
jk-symbols.zip.asc 12-Apr-2007 22:37 1k
mod_jk-apache-1.3.37.so 12-Apr-2007 22:12 180k
mod_jk-apache-1.3.37.so.asc 12-Apr-2007 22:37 1k
mod_jk-apache-2.0.59.so 12-Apr-2007 22:11 188k
mod_jk-apache-2.0.59.so.asc 12-Apr-2007 22:37 1k
mod_jk-apache-2.2.4.so 12-Apr-2007 22:11 188k
mod_jk-apache-2.2.4.so.asc 12-Apr-2007 22:37 1k
nsapi_redirect.dll 12-Apr-2007 22:32 176k
Internet
100%
Download this file and place it in the Wamp/Apache2/modules directory.

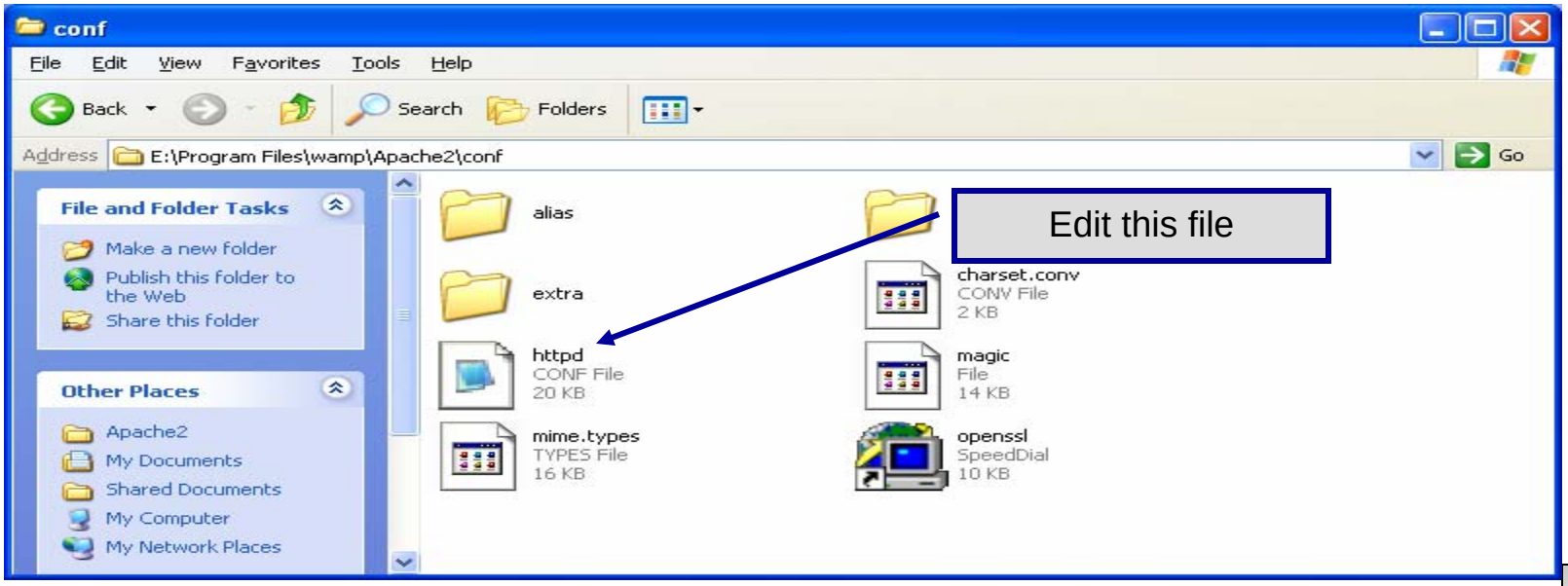
Installing The Tomcat Connector

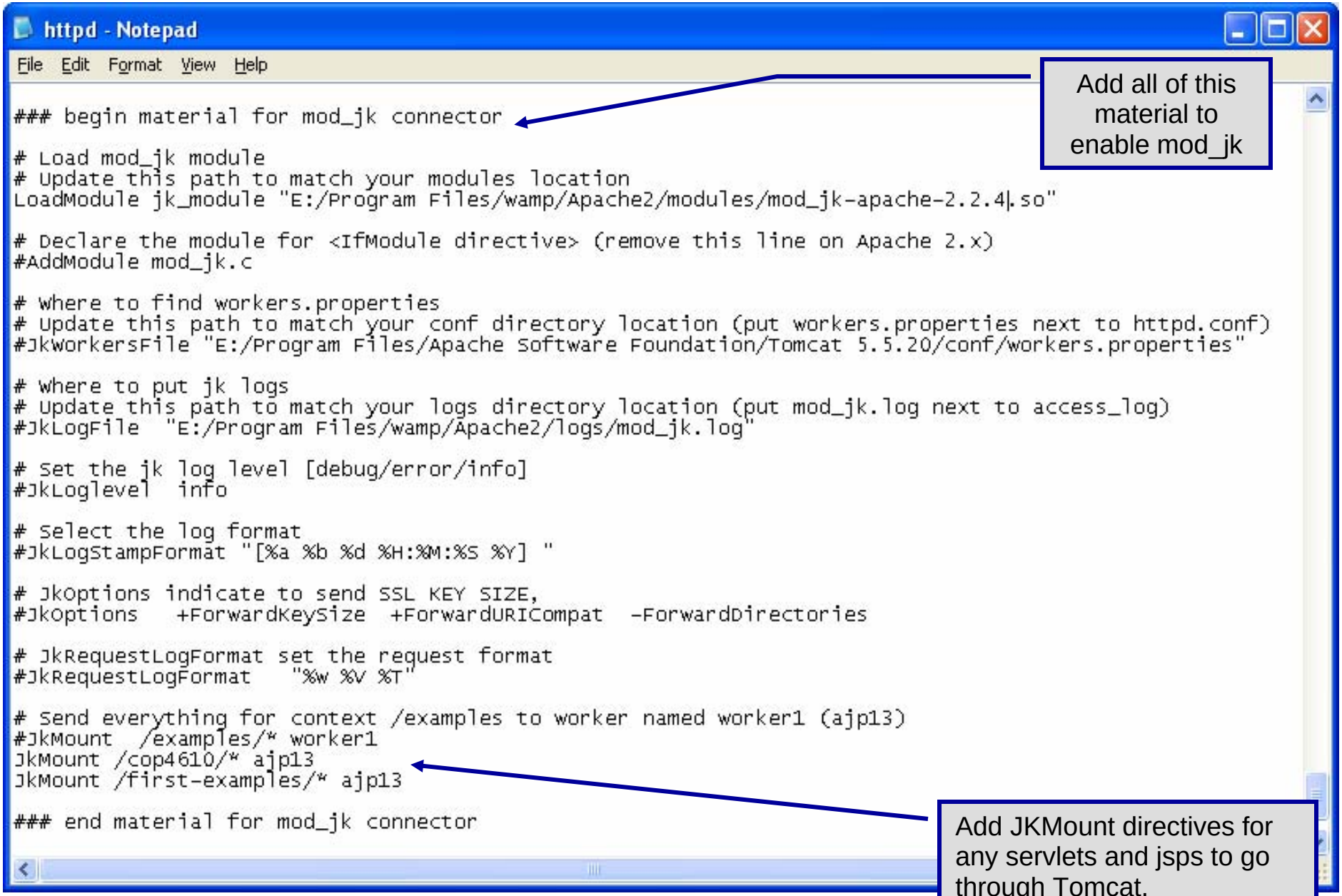
- Once you've downloaded the Tomcat connector, put it in the `modules` sub-directory of your Apache installation's root directory.



Enabling The Tomcat Connector

- Once you've put the connector file in the `modules` sub-directory of your Apache installation's root directory, you are now ready to configure Apache to recognize and enable the module.
- To do this you'll need to edit your Apache configuration file. This is the same file you edited to enable PHP.
- This file is located in the `conf` subdirectory and is named `httpd`.




httpd - Notepad
File Edit Format View Help
begin material for mod_jk connector
Load mod_jk module
Update this path to match your modules location
LoadModule jk_module "E:/Program Files/wamp/Apache2/modules/mod_jk-apache-2.2.4.so"
Declare the module for <IfModule directive> (remove this line on Apache 2.x)
#AddModule mod_jk.c
Where to find workers.properties
Update this path to match your conf directory location (put workers.properties next to httpd.conf)
#JkWorkersFile "E:/Program Files/Apache Software Foundation/Tomcat 5.5.20/conf/workers.properties"
Where to put jk logs
Update this path to match your logs directory location (put mod_jk.log next to access_log)
#JkLogFile "E:/Program Files/wamp/Apache2/logs/mod_jk.log"
Set the jk log level [debug/error/info]
#JkLogLevel info
Select the log format
#JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "
JkOptions indicate to send SSL KEY SIZE,
#JkOptions +ForwardKeySize +ForwardURICompat -ForwardDirectories
JkRequestLogFormat set the request format
#JkRequestLogFormat "%w %V %T"
Send everything for context /examples to worker named worker1 (ajp13)
#JkMount /examples/* worker1
JkMount /cop4610/* ajp13
JkMount /first-examples/* ajp13
end material for mod_jk connector
Add all of this material to enable mod_jk
Add JKMount directives for any servlets and jsps to go through Tomcat.

- The `JWorkerFile` directive (see previous page) refers to a separate file that configures the `ajp13` protocol communications parameters. An example called `workers.properties` is included with `mod_jk`. For a basic set-up, this default file will work fine.

- There are a couple of things you should verify however: (1) `workers.tomcat_home` should agree with the value you've already set for Tomcat called `CATALINA_HOME`, and (2) `worker.ajp13.port` must be the same as the one listed in the Tomcat `server.xml` file as shown on the next page.

- In more robust applications, additional editing of the `JWorkerFile` will be required. For example, if you have more than one installation of Tomcat on your machine, you'll need to adjust the `worker.ajp.port` parameter in `workers.properties` to make sure that `mod_jk` is connecting to the correct Tomcat installation as Tomcat installations will not be able to start up sharing port numbers.

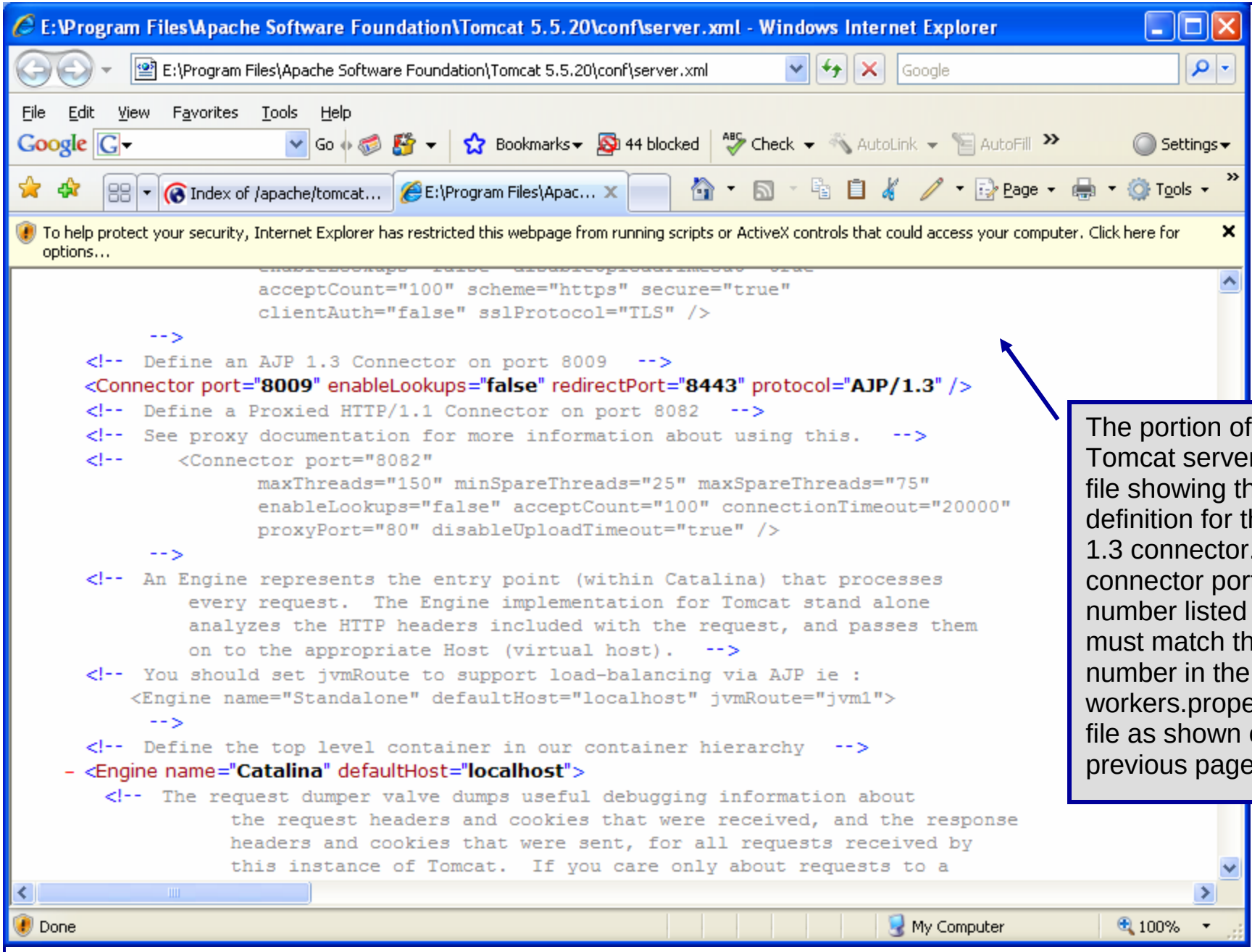
workers - WordPad

File Edit View Insert Format Help

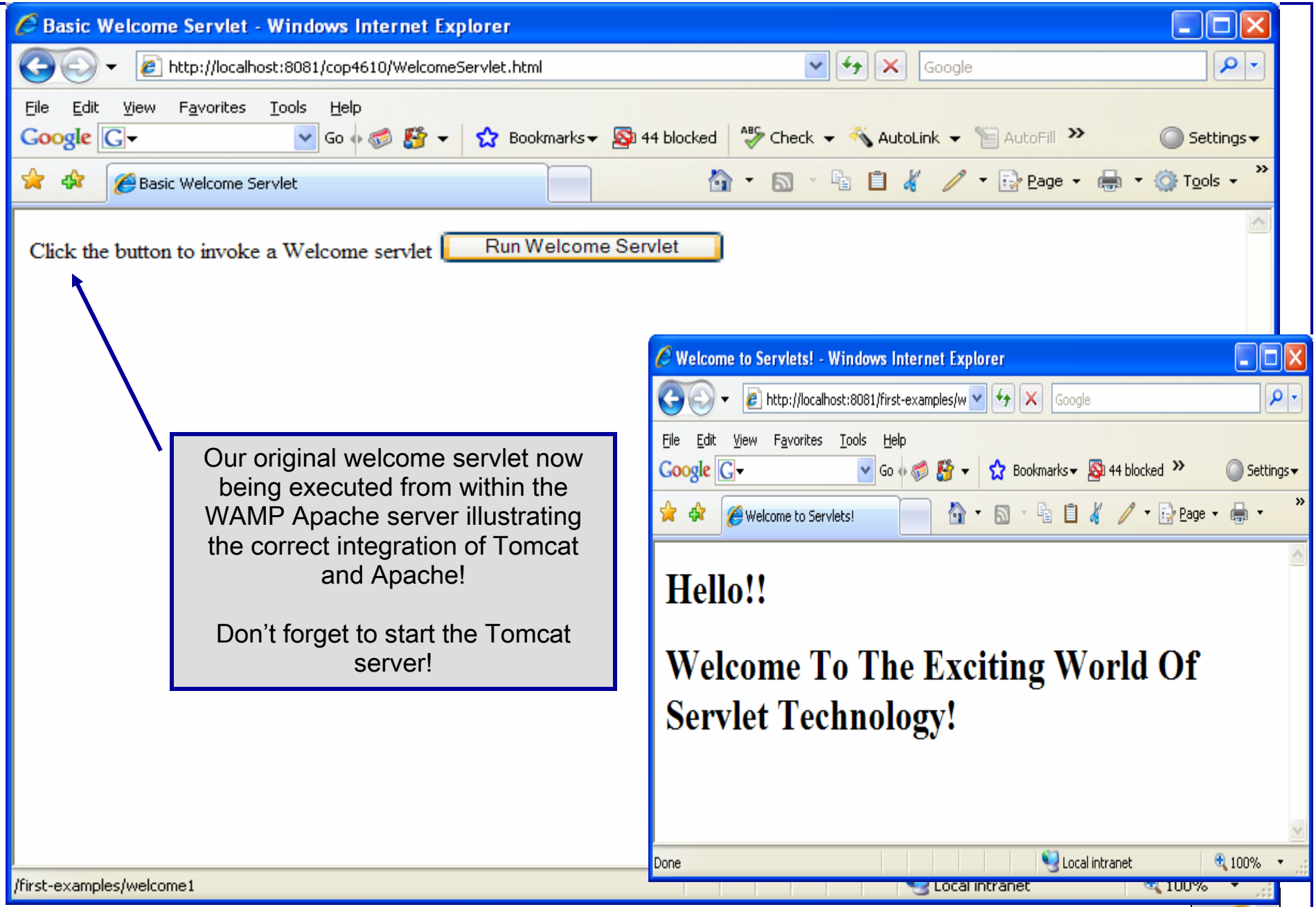
```
worker.ajp12.lbfactor=1

#
#------ DEFAULT ajp13 WORKER DEFINITION ------------------------------
#---------------------------------------------------------------------
#

#
# Defining a worker named ajp13 and of type ajp13
# Note that the name and the type do not have to match.
#
worker.ajp13.port=8009
worker.ajp13.host=localhost
worker.ajp13.type=ajp13
#
# Specifies the load balance factor when used with
# a load balancing worker.
# Note:
#  ----> lbfactor must be > 0
#  ----> Low lbfactor means less work done by the worker.
worker.ajp13.lbfactor=1

#
# Specify the size of the open connection cache.
#worker.ajp13.cachesize

#
#------ DEFAULT LOAD BALANCER WORKER DEFINITION ----------------------
#---------------------------------------------------------------------
#
```

For Help, press F1 NUM

The portion of the Tomcat worker.properties file showing the definition for the default AJP 1.3 worker. NOTE: the port number listed here must match the port number listed in the Tomcat server.xml file as shown on the next page.

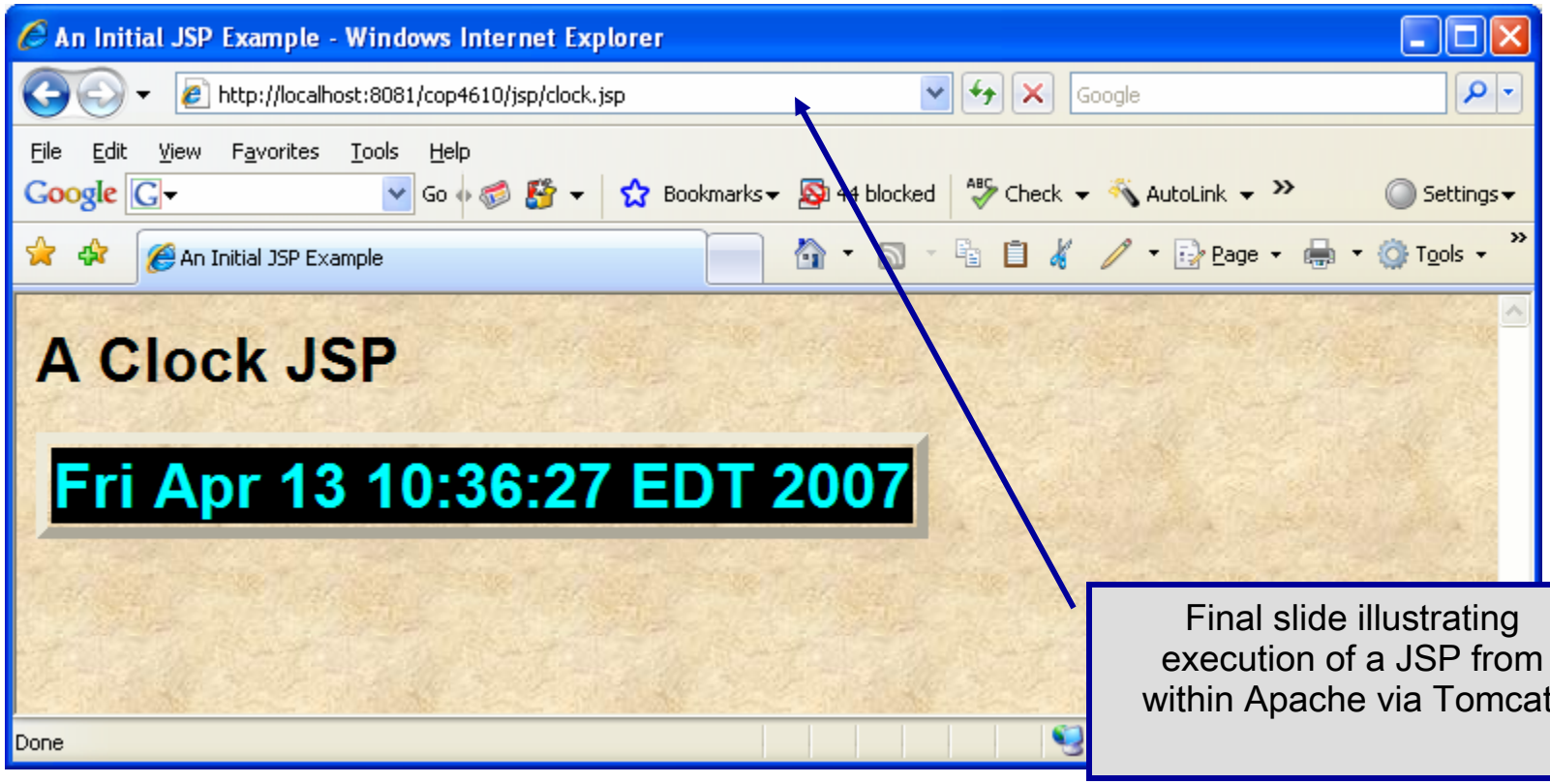


The portion of the Tomcat server.xml file showing the definition for the AJP 1.3 connector. This connector port number listed here must match the port number in the workers.properties file as shown on the previous page.



Our original welcome servlet now being executed from within the WAMP Apache server illustrating the correct integration of Tomcat and Apache!

Don't forget to start the Tomcat server!



Final slide illustrating execution of a JSP from within Apache via Tomcat.