PHP/MySQL

Introduction to Database

I MSc CS

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Goal of this tutorial

- Not to teach everything about PHP, but provide the basic knowledge
- Explain code of examples
- Provide some useful references

What is PHP?

- PHP == 'Hypertext Preprocessor'
- Open-source, server-side scripting language
- Used to generate dynamic web-pages
- PHP scripts reside between reserved PHP tags
  - This allows the programmer to embed PHP scripts within HTML pages

What is PHP (cont'd)

- Interpreted language, scripts are parsed at run-time rather than compiled beforehand
- Executed on the server-side
- Source-code not visible by client
  - 'View Source' in browsers does not display the PHP code
- Various built-in functions allow for fast development
- Compatible with many popular databases

What does PHP code look like?

- Structurally similar to C/C++
- Supports procedural and object-oriented paradigm (to some degree)
- All PHP statements end with a semi-colon
- Each PHP script must be enclosed in the reserved PHP tag

```
<?php
    ...
?>
```

Comments in PHP

- Standard C, C++, and shell comment symbols

```
// C++ and Java-style comment

# Shell-style comments

/* C-style comments
     These can span multiple lines */
```

Variables in PHP

- PHP variables must begin with a "$" sign
- Case-sensitive ($Foo != $foo != $fOo)
- Global and locally-scoped variables
  - Global variables can be used anywhere
  - Local variables restricted to a function or class
- Certain variable names reserved by PHP
  - Form variables ($_POST, $_GET)
  - Server variables ($_SERVER)
  - Etc.

Variable usage

```
<?php
$foo = 25;              // Numerical variable
$bar = "Hello";         // String variable

$foo = ($foo * 7);      // Multiplies foo by 7
$bar = ($bar * 7);      // Invalid expression
?>
```

Echo

- The PHP command '**echo**' is used to output the parameters passed to it
  - The typical usage for this is to send data to the client's web-browser
- Syntax
  - void **echo** (string arg***1*** [, string arg***n***...])
  - In practice, arguments are not passed in parentheses since **echo** is a language construct rather than an actual function

Echo example

```
<?php
$foo = 25;              // Numerical variable
$bar = "Hello";         // String variable

echo $bar;              // Outputs Hello
echo $foo,$bar;         // Outputs 25Hello
echo "5x5=",$foo;       // Outputs 5x5=25
echo "5x5=$foo";        // Outputs 5x5=25
echo '5x5=$foo';        // Outputs 5x5=$foo
?>
```

- **Notice** how echo '5x5=$foo' outputs $foo rather than replacing it with 25
- Strings in single quotes (' ') are not interpreted or evaluated by PHP
- This is true for both variables and character escape-sequences (such as "\n" or "\\")

Arithmetic Operations

```
<?php
        $a=15;
        $b=30;
        $total=$a+$b;
        Print $total;
        Print "<p><h1>$total</h1>";
        // total is 45
?>
```

- $a - $b // subtraction
- $a * $b // multiplication
- $a / $b // division
- $a += 5 // $a = $a+5 Also works for *= and /=

Concatenation

- Use a period to join strings into one.

```
<?php
$string1="Hello";
$string2="PHP";
$string3=$string1 . " " . $string2;
Print $string3;
?>
```

```
Hello PHP
```

Escaping the Character

- If the string has a set of double quotation marks that must remain visible, use the \ [backslash] before the quotation marks to ignore and display them.

```
<?php
$heading="\"Computer Science\"";
Print $heading;
?>
```

```
"Computer Science"
```

PHP Control Structures

- Control Structures: Are the structures within a language that allow us to control the flow of execution through a program or script.
- Grouped into conditional (branching) structures (e.g. if/else) and repetition structures (e.g. while loops).
- Example if/else if/else statement:

```
if ($foo == 0) {
        echo 'The variable foo is equal to 0';
}
else if (($foo > 0) && ($foo <= 5)) {
        echo 'The variable foo is between 1 and 5';
}
else {
        echo 'The variable foo is equal to '.$foo;
}
```

If … Else…

- If (condition)
  {
  Statements;
  }
  Else
  {
  Statement;
  }

```
<?php
If($user=="John")
{
        Print "Hello John.";
}
Else
{
        Print "You are not John.";
}
?>
```

No THEN in PHP

While Loops

- While (condition)
  {
  Statements;
  }

```
<?php
$count=0;
While($count<3)
{
        Print "hello PHP. ";
        $count += 1;
        // $count = $count + 1;
        // or
        // $count++;
?>
```

```
hello PHP. hello PHP. hello PHP.
```

Date Display

```
2009/4/1
```

```
$datedisplay=date("yyyy/m/d");
Print $datedisplay;
# If the date is April 1st, 2009
# It would display as 2009/4/1
```

```
Wednesday, April 1, 2009
```

```
$datedisplay=date("l, F m, Y");
Print $datedisplay;
# If the date is April 1st, 2009
# Wednesday, April 1, 2009
```

Month, Day & Date Format Symbols

M	Jan
F	January
m	01
n	1

Day of Month	d	01
Day of Month	J	1
Day of Week	l	Monday
Day of Week	D	Mon

Functions

- Functions MUST be defined before then can be called
- Function headers are of the format
  - `function functionName($arg_1, $arg_2, …, $arg_n)`
- Unlike variables, function names are not case sensitive (foo(…) == Foo(…) == FoO(…))

Functions example

```
<?php
      // This is a function
      function foo($arg_1, $arg_2)
       {
         $arg_2 = $arg_1 * $arg_2;
         return $arg_2;
      }

      $result_1 = foo(12, 3);          // Store the function
      echo $result_1;                  // Outputs 36
      echo foo(12, 3);                 // Outputs 36
?>
```

Include Files

Include “opendb.php”;

Include “closedb.php”;

This inserts files; the code in files will be inserted into current code. This will provide useful and protective means once you connect to a database, as well as for other repeated functions.

Include (“footer.php”);

The file footer.php might look like:

<hr SIZE=11 NOSHADE WIDTH=“100%”>

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URL: http://www.kent.edu

PHP - Forms

- Access to the HTTP POST and GET data is simple in PHP
- The global variables $_POST[] and $_GET[] contain the request data

```
<?php
    if ($_POST["submit"])
        echo "<h2>You clicked Submit!</h2>";
    else if ($_POST["cancel"])
        echo "<h2>You clicked Cancel!</h2>";
 ?>
 <form action="form.php" method="post">
    <input type="submit" name="submit" value="Submit">
    <input type="submit" name="cancel" value="Cancel">
 </form>
```

http://www.cs.kent.edu/~nruan/form.php

WHY PHP – Sessions ?

Whenever you want to create a website that allows you to store and display information about a user, determine which user groups a person belongs to, utilize permissions on your website or you just want to do something cool on your site, PHP's Sessions are vital to each of these features.

Cookies are about 30% unreliable right now and it's getting worse every day. More and more web browsers are starting to come with security and privacy settings and people browsing the net these days are starting to frown upon Cookies because they store information on their local computer that they do not want stored there.

PHP has a great set of functions that can achieve the same results of Cookies and more without storing information on the user's computer. PHP Sessions store the information on the web server in a location that you chose in special files. These files are connected to the user's web browser via the server and a special ID called a "Session ID". This is nearly 99% flawless in operation and it is virtually invisible to the user.

PHP - Sessions

- Sessions store their identifier in a cookie in the client's browser
- Every page that uses session data must be proceeded by the **session_start()** function
- Session variables are then set and retrieved by accessing the global **$_SESSION[]**

- **Save it as session.php**

```
<?php
    session_start();
    if (!$_SESSION["count"])
        $_SESSION["count"] = 0;
    if ($_GET["count"] == "yes")
        $_SESSION["count"] = $_SESSION["count"] + 1;
    echo "<h1>".$_SESSION["count"]."</h1>";
?>
<a href="session.php?count=yes">Click here to count</a>
```

http://www.cs.kent.edu/~nruan/session.php

Avoid Error PHP - Sessions

PHP Example: <?php
echo "Look at this nasty error below:
";
session_start();
?>
Error!

Warning: Cannot send session cookie - headers already sent by (output started at session_header_error/session_error.php:2) in session_header_error/session_error.php on line 3

Warning: Cannot send session cache limiter - headers already sent (output started at session_header_error/session_error.php:2) in session_header_error/session_error.php on line 3

PHP Example: <?php
session_start();
echo "Look at this nasty error below:";
?>
Correct

Destroy PHP - Sessions

Destroying a Session

why it is necessary to destroy a session when the session will get destroyed when the user closes their browser. Well, imagine that you had a session registered called "access_granted" and you were using that to determine if the user was logged into your site based upon a username and password. Anytime you have a login feature, to make the users feel better, you should have a logout feature as well. That's where this cool function called session_destroy() comes in handy. session_destroy() will completely demolish your session (no, the computer won't blow up or self destruct) but it just deletes the session files and clears any trace of that session.

NOTE: If you are using the $_SESSION superglobal array, you must clear the array values first, then run session_destroy.

Here's how we use session_destroy():

Destroy PHP - Sessions

```
<?php
// start the session
session_start();
header("Cache-control: private"); //IE 6 Fix
$_SESSION = array();
session_destroy();
echo "<strong>Step 5 - Destroy This Session </strong><br />";
if($_SESSION['name']){
    echo "The session is still active";
} else {
    echo "Ok, the session is no longer active! <br />";
    echo "<a href=\"page1.php\"><< Go Back Step 1</a>";
}
?>
```

http://www.cs.kent.edu/~nruan/session_destroy.php

PHP Overview

- Easy learning
- Syntax Perl- and C-like syntax. Relatively easy to learn.
- Large function library
- Embedded directly into HTML
- Interpreted, no need to compile
- Open Source server-side scripting language designed specifically for the web.

PHP Overview (cont.)

- Conceived in 1994, now used on +10 million web sites.
- Outputs not only HTML but can output XML, images (JPG & PNG), PDF files and even Flash movies all generated on the fly. Can write these files to the file system.
- Supports a wide-range of databases (20+ODBC).
- PHP also has support for talking to other services using protocols such as LDAP, IMAP, SNMP, NNTP, POP3, HTTP.

First PHP script

- Save as sample.php:

```
<!– sample.php -->
<html><body>
    <strong>Hello World!</strong><br />
   <?php
              echo "<h2>Hello, World</h2>"; ?>
   <?php
        $myvar = "Hello World";
        echo $myvar;
    ?>
</body></html>
```

http://www.cs.kent.edu/~nruan/sample.php

Example – show data in the tables

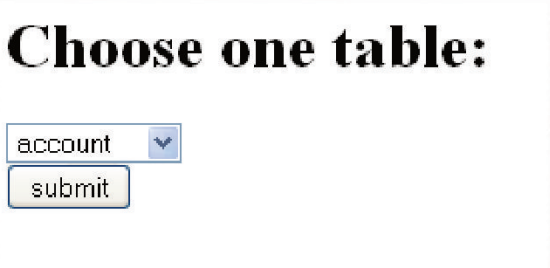
- Function: list all tables in your database. Users can select one of tables, and show all contents in this table.

- second.php
- showtable.php

http://www.cs.kent.edu/~nruan/second.php

second.php

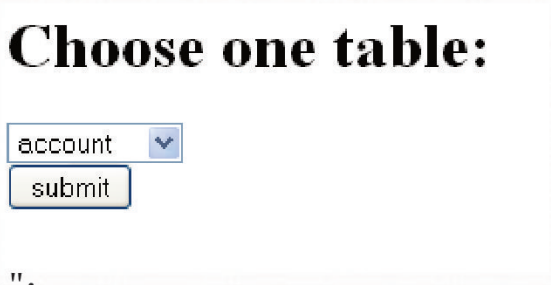
```
<html><head><title>MySQL Table Viewer</title></head><body>
<?php
// change the value of $dbuser and $dbpass to your username and password
$dbhost = 'hercules.cs.kent.edu:3306';
$dbuser = 'nruan';
$dbpass = '**********';
$dbname = $dbuser;
$table = 'account';
$conn = mysql_connect($dbhost, $dbuser, $dbpass);
if (!$conn) {
   die('Could not connect: ' . mysql_error());
}
if (!mysql_select_db($dbname))
   die("Can't select database");
```



second.php (cont.)

```
$result = mysql_query("SHOW TABLES");
if (!$result) {
   die("Query to show fields from table failed");
}
$num_row = mysql_num_rows($result);
echo "<h1>Choose one table:<h1>";
echo "<form action=\"showtable.php\"  method=\"POST\">";
echo "<select name=\"table\"  size=\"1\" Font size=\"+2\">";
for($i=0; $i<$num_row; $i++) {
    $tablename=mysql_fetch_row($result);
    echo "<option value=\"{$tablename[0]}\"  >{$tablename[0]}</option>";
}
echo "</select>";
echo "<div><input type=\"submit\" value=\"submit\"></div>";
echo "</form>";

mysql_free_result($result);
mysql_close($conn);
?>
</body></html>
```



showtable.php

```
<html><head>
<title>MySQL Table Viewer</title>
</head>
<body>
<?php
$dbhost = 'hercules.cs.kent.edu:3306';
$dbuser = 'nruan';
$dbpass = '**********';
$dbname = 'nruan';
$table = $_POST["table"];
$conn = mysql_connect($dbhost, $dbuser, $dbpass);
if (!$conn)
    die('Could not connect: ' . mysql_error());
if (!mysql_select_db($dbname))
    die("Can't select database");
$result = mysql_query("SELECT * FROM {$table}");
if (!$result)  die("Query to show fields from table failed!" . mysql_error());
```

Table: account

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350
A-111	Perryridge	900

```
$fields_num = mysql_num_fields($result);
echo "<h1>Table: {$table}</h1>";
echo "<table border='1'><tr>";
// printing table headers
for($i=0; $i<$fields_num; $i++) {
    $field = mysql_fetch_field($result);
    echo "<td><b>{$field->name}</b></td>";
}
echo "</tr>\n";
while($row = mysql_fetch_row($result)) {
    echo "<tr>";
    // $row is array... foreach( .. ) puts every element
    // of $row to $cell variable
    foreach($row as $cell)
            echo "<td>$cell</td>";
    echo "</tr>\n";
}
mysql_free_result($result);
mysql_close($conn);
?>
</body></html>
```

Table: account

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350
A-111	Perryridge	900

Functions Covered

- mysql_connect()
- include()
- mysql_query()
- mysql_fetch_array()
- mysql_select_db()
- mysql_num_rows()
- mysql_close()

History of PHP

- PHP began in 1995 when Rasmus Lerdorf developed a Perl/CGI script toolset he called the Personal Home Page or PHP
- PHP 2 released 1997 (PHP now stands for Hypertex Processor). Lerdorf developed it further, using C instead
- PHP3 released in 1998 (50,000 users)
- PHP4 released in 2000 (3.6 million domains). Considered debut of functional language and including Perl parsing, with other major features
- PHP5.0.0 released July 13, 2004 (113 libraries>1,000 functions with extensive object-oriented programming)
- PHP5.0.5 released Sept. 6, 2005 for maintenance and bug fixes