IT360: Applied Database Systems

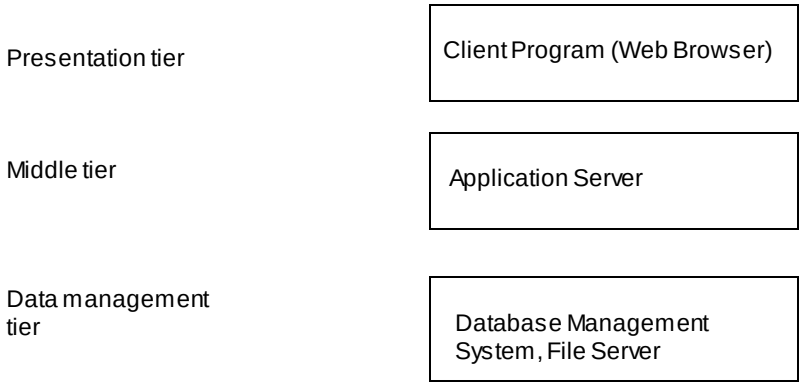
Introduction to PHP

Chapter 1 and Chapter 6 in "PHP and MySQL Web Development"

Course Topics

- Relational model
- SQL
- Database design
- Normalization
- Triggers. SP, Views
- PHP
- Database administration
- Transaction Processing
- Data Storage and Indexing

The Three-Tier Architecture

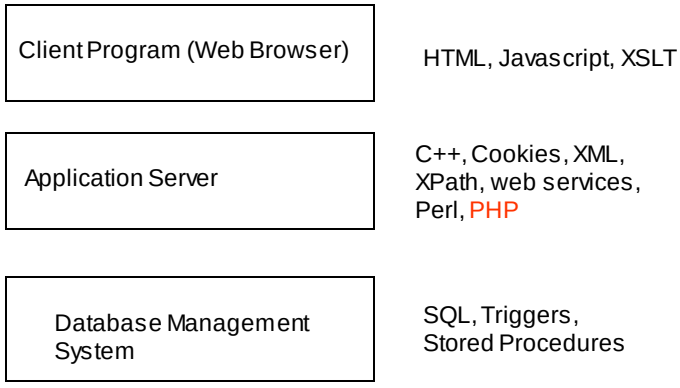


Example 1: Airline reservations

Build a system for making airline reservations

- Database System
- Application Server
- Client Program

Technologies



Web Applications

- Need to choose:
  - Operating system
  - Web server software
  - Database Management System
  - Programming or scripting language

PHP

- PHP: PHP Hypertext Preprocessor
- Server-side scripting language

- PHP pages require a web server with PHP support

- Competitors:

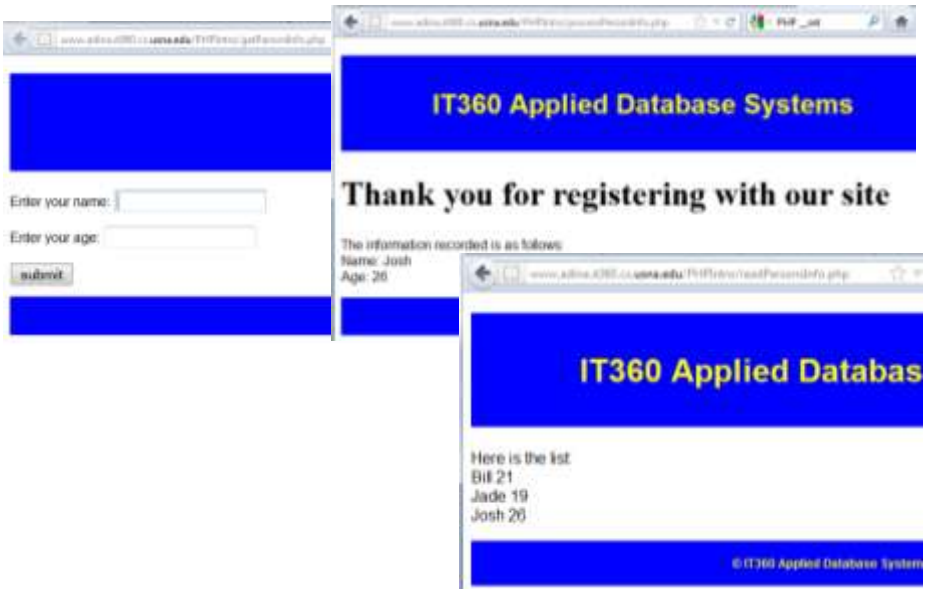
PHP Strengths

- High performance
- Interface to many different database systems
- Built-in libraries
- Ease of learning and use
- Object-oriented support
- Portability
- Open source
- Free
- Availability of support

PHP References

- Online references
  - http://www.php.net
- Online Tutorial
  - http://www.w3schools.com/php/default.asp
- *PHP and MySQL Web Development* by Luke Welling and Laura Thomson
- IT350 textbook: Internet & WWW How To Program by Deitel, Deitel, and Goldberg

CGI – What does it all look like?



IT350 - CGI Script Basics

- Common Gateway Interface (CGI)
  - "Common": Not specific to any operating system or language

- Output file generated at runtime:
  1. When a program executed as a CGI script, "standard output" is redirected to client Web server
  2. Web server then redirects output to client's browser

IT350 - How can CGI get data from user?

Technique #1: Forms

- User enters data via a form, submits
- Form directs results to a CGI program
- Script receives data in one of two ways:
  1. Method = "GET"
  2. Method = "POST"

  Use language-specific method to get these inside CGI program

Technique #2: URL with parameters

```
<a href=http://www.cs.usna.edu/calendar/view.php?events=seminars>
    Seminars </a>
```

Form Processing

PHP Overview

- PHP tags <?php ?>
  - Mixed with HTML tags
  - File extension .php
- Statements
  - Separated by semicolon
  - if..else.., while, do, for, switch
- Variables
  - $varname
  - Type determined by content; variables not declared; case sensitive
- Strings
  - Single quotes – literal string
  - Double quotes – interpolated string (variables are replaced with their value)
- Accessing form variables
  - $_POST['age'], $_GET['age'], $_REQUEST['age']

PHP Overview

- PHP objects
  - Java-like inheritance
  - public, private, or protected attributes and methods
  - __construct(), __destruct(),
  - __set(), __get()
- PHP functions
  - function myFunction($param1, $param2){…}
- Files
  - *resource* fopen(*string* $fileName, *string* $mode)
  - *int* fwrite(*resource* $handle, *string* $someText)
  - *int* fclose(*resource* $handle)
  - *string* fgets(*resource* $handle)
  - *boolean* feof*(resource* $handle*)*

How everything works: Step 1: Input Form – form.html

```
<!DOCTYPE html>

<html><head><title>IT360 PHP test page</title><meta charset = “utf-8”></head>
<body>

 <form action="processPersonInfo.php" method="post">

   <p><label>Enter your name: <input type="text" name="name"/></label></p>

   <p><label>Enter your age: <input type="text" name="age" /></label></p>

   <p><input type="submit" name = "submit" value = "Submit"/></p>

  </form>
</body> </html>
```

page.inc.php

```
<?php
class Page{

//attributes
public $content;
private $title;

private $header = "<!DOCTYPE html>";

//constructor
public function __construct($title){
   $this->title = $title;
}

//set private attributes
public function __set($name, $value){
   $this->$name = $value;
}

//display page
public function display(){
   echo $this->header;
   echo "<head><title> $this->title </title></head>";
   echo "<body>";
   echo $this->content;
   echo "</body></html>";
}
} //end class definition
?>
```

Step 1 version 2 – getPersonInfo.php

```
<?php

   //bring in the class definitions,
   //so we can use them
   require('page.inc.php');


   //create a new page object
   $page = new Page("Input person");

   //set the content: in needs to be a form
   $page->content = '<form action = "processPersonInfo.php" method = "post">'.
         '<p><label>Enter your name: <input type="text" name="name"/></label></p>'.
         '<p><label>Enter your age: <input type="text" name="age"/></label></p>'.
                                    '<input type = "submit" value = "submit">';

   //display the page
   $page->display();

?>
```

Class Exercise

- Create Person class with static method *string* getPersonAttributesAsHTMLInput() that returns

```
'<p><label>Enter your name: <input type="text"
   name="name"/></label></p>'.
        '<p><label>Enter your age: <input type="text"
   name="age"/></label></p>'
```

- Modify getPersonInfo.php to use the **`getPersonAttributesAsHTMLInput`** method in Person class

person.inc.php – part 1

```
<?php

/* define a class Person with name and age */
class Person{

   private $name;
   private $age;

   //constructor
   public function __construct(){}

   //default set function invoked when the private fields are set
   //this is a good place to do sanity/security checks
   public function __set($varName, $varValue)
   {
        $varValue = trim($varValue);
        $varValue = strip_tags($varValue);
        if (!get_magic_quotes_gpc()){
                $varValue = addslashes($varValue);
        }
        $this->$varName = $varValue;
   }

   //default get function - nothing special for now
   public function __get($varName)
   {
        return $this->$varName;
   }
```

person.inc.php – part 2

```
//return a string that contains the HTML code to get data for a person
public static function getPersonAttributesAsHTMLInput()
{
      $myString = '<p><label>Enter your name: <input type="text"
name="name"/></label></p>
      <p><label>Enter your age: <input type="text" name="age"
/></label></p>';
      return $myString;
}

//process the person info to insert to file and display confirmation
public function processPerson(){
      //write this person to the default file
      $success = $this->insertToFile();

      //return a confirmation message
      if ($success){
            $confirmation = '<h1>Thank you for registering with our
site</h1>'.
                  '<p>The information recorded is as follows: <br
/>'.
                  "Name: $this->name <br /> Age: $this->age </p>";
      }
      else{
            $confirmation = '<h1>Error: we had problems with your
registration (probably some file error - permissions??).
            Please try again.</h1>';
      }

      return $confirmation;
}
```

person.inc.php – part 3

```
/* save the content to a specified file
   or "persons.txt" if nothing is specified */
   private function insertToFile($fileName="persons.txt")
   {
      $fp = @fopen($fileName, 'a');
       if (!$fp){
            return false;
       }
       else{
            $text = "$this->name\t$this->age\n";
            fwrite($fp, $text);
            fclose($fp);
            return true;
       }
   }
```

person.inc.php – part 4

```
    /*read all info from file and return it in some nice format */
     public static function getAllPersonsInfo($fileName = "persons.txt"){

          //read the data from file and construct the content
          $fp = @fopen($fileName, 'r');
          //check for errors
          if (!$fp){
                    $content = "<p>ERROR! Could not open file $fileName for
    reading.</p>";
          }
          //if everything OK, read the file
          else{
                    $content= '<p>Here is the list: <br />';
                    //read one line
                    $line = fgets($fp);
                    while( !feof($fp) ){
                              //process the line
                              $content .= $line . '<br />';

                              //read next line
                              $line = fgets($fp);
                    }
                    $content .= '</p>';
                    //close the file
                    fclose($fp);
          }

          return $content;
    }
}?>
```

Step 2 processPersonInfo.php

```
<?php

    //bring in the class definitions,
    require('page.inc.php'); require('person.inc.php');

    //get the params sent by the form
    $name = $_POST['name']; $age = $_POST['age'];

    //create a new page object
    $page = new Page("Registration confirmation");

    //check that input params ok
    if (empty($name) || empty($age)){
          $page->content = '<p> Name or age not entered!! Try again</p>';
          $page->display();
          exit;
    }

    //create a new person with these properties
    $dummy = new Person();
    $dummy->name = $name;
    $dummy->age = $age;

    //set the content: the confirmation message returned by the processPerson
    method for this person; all work is done inside processPerson
    $page->content = $dummy->processPerson();

    //display the page
    $page->display(); ?>
```

Step 3: readPearsonsInfo.php

```
<?php

   //bring in the class definitions,
   //so we can use them
   require('page.inc.php');
   require('person.inc.php');

   //get the input params (from URL)
   if (isset($_GET['filename'])){
        $fileName = $_GET['filename'];
   }
   else{
        $fileName = "persons.txt";
   }

   //create a new page object
   $page = new Page("Persons list");

   //set the content: the confirmation message returned by the
   processPerson method for this person
   //all work is done inside getAllPersonsInfo
   $page->content = Person::getAllPersonsInfo($fileName);

   //display the page
   $page->display();
?>
```

Class Exercise

- Create a PHP script that accepts a parameter called *number* from the address bar and prints back the English word for the decimal value (assume number is between 1 and 5). You should create first a file that looks like this, and read from it:

One
Two
Three
Four
Five

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