Database Management Systems
Session 8

Instructor: Vinnie Costa
vcosta@optonline.net
After a summer-long delay, Eastman Kodak Co. has just begun shipping the groundbreaking digital camera that, within range of hotels, coffee shops, airport lounges, offices, homes and other wireless hot spots, can deliver high-quality pictures directly onto the Internet and into e-mail boxes around the globe.

Users of the new EasyShare-One, priced at $599, can send photos directly through a Wi-Fi transmitter at home or work, or pay $4.99 per month to connect the camera with any of T-Mobile USA's 6,000 hot spots at stores, airports, hotels and other establishments.
Internet Applications

Session 8
The First Compiler…and Bug!

Grace Murray Hopper (December 9, 1906 – January 1, 1992) was an early computer pioneer. She was the first programmer for the Mark I Calculator and the developer of the first compiler for a computer programming language. Hopper was born Grace Brewster Murray. She graduated Phi Beta Kappa from Vassar College with a bachelor's degree in mathematics and physics in 1928 and 1934 became the first woman to receive a Ph.D. in mathematics.

She was well-known for her lively and irreverent speaking style, as well as a rich treasury of early "war stories". While she was working on a Mark II computer at Harvard University, her associates discovered a moth stuck in a relay and thereby impeding operation, whereupon she remarked that they were "debugging" the system. Though the term computer bug cannot be definitively attributed to Admiral Hopper, she did bring the term into popularity. The remains of the moth can be found in the group's log book at the Naval Surface Warfare Center in Dahlgren, VA

http://ei.cs.vt.edu/~history/Hopper.Danis.html
Lecture Overview

◆ Setup WAMP Environment
◆ Using FORMS With PHP
◆ Connecting To MySQL With PHP
◆ Some Handy Tools
◆ Getting Data From MySQL With PHP
◆ Other Things We Can Do From Tutorial
Install Apache

- [http://httpd.apache.org/docs/2.0/platform/windows.html](http://httpd.apache.org/docs/2.0/platform/windows.html)

- Installing apache is easy if you download the Microsoft Installer (.msi) package. Just double click on the icon to run the installation wizard. Click next until you see the Server Information window. You can enter localhost for both the Network Domain and Server Name. As for the administrator's email address you can enter anything you want.

- If using Windows XP, installed Apache as Service so every time I start Windows Apache is automatically started.
Installing Apache

* Click the **Next** button and choose **Typical installation**. Click Next one more time and choose where you want to install Apache (I installed it in the default location C:\Program Files\Apache Group). Click the Next button and then the Install button to complete the installation process.
Installing Apache

To see if you Apache installation was successful open up your browser and type http://localhost (or http://127.0.0.1) in the address bar. You should see something like this:

If you can see this, it means that the installation of the Apache web server software on this system was successful. You may now add content to this directory and replace this page.

---

Seeing this instead of the website you expected?

This page is here because the site administrator has changed the configuration of this web server. Please contact the person responsible for maintaining this server with questions. The Apache Software Foundation, which wrote the web server software this site administrator is using, has nothing to do with maintaining this site and cannot help resolve configuration issues.

---

The Apache documentation has been included with this distribution.

You are free to use the image below on an Apache-powered web server. Thanks for using Apache!
Installing Apache

- By default Apache's **document root** is set to **htdocs** directory. The document root is where you must put all your PHP or HTML files so it will be processed by Apache (and can be seen through a web browser). Of course you can change it to point to any directory you want. The configuration file for Apache is stored in `C:\Program Files\Apache Group\Apache2\conf\httpd.conf` (assuming you installed Apache in `C:\Program Files\Apache Group`). It's just a plain text file so you can use Notepad to edit it.

- For example, if you want to put all your PHP or HTML files in `C:\www` just find this line in the `httpd.conf`:

  ```
  DocumentRoot "C:/Program Files/Apache Group/Apache2/htdocs"
  ```

  and change it to:

  ```
  DocumentRoot "C:/www"
  ```

- After making changes to the configuration file you have to restart Apache (Start > Programs > Apache HTTP Server 2.0 > Control Apache Server > Restart) to see the effect.
Installing Apache

- Another configuration you may want to change is the **directory index**. This is the file that Apache will show when you request a directory. As an example if you type [http://www.php-mysql-tutorial.com/](http://www.php-mysql-tutorial.com/) without specifying any file the `index.php` file will be automatically shown.

- Suppose you want apache to use `index.html`, `index.php` or `main.php` as the directory index you can modify the DirectoryIndex value like this:

  ```
  DirectoryIndex index.html index.php main.php
  ```

- Now whenever you request a directory such as [http://localhost/](http://localhost/) Apache will try to find the `index.html` file or if it's not found Apache will use `index.php`. In case `index.php` is also not found then `main.php` will be used.
Installing Nvu

- www.nvu.com/
- A complete Web Authoring System for Linux Desktop users as well as Microsoft Windows and Macintosh users to rival programs like FrontPage and Dreamweaver.
- Nvu (pronounced N-view, for a "new view") makes managing a web site a snap. Now anyone can create web pages and manage a website with no technical expertise or knowledge of HTML.
Make A Home Page

- Create an `index.html` page with Nvu
- Copy `C:\Program Files\Apache Group\Apache2\htdocs` to `old_htdocs`
- Put the `index.html` into `htdocs`
- Test with `http://localhost` or `http://127.0.0.1`
- Explore Cascading Style Sheets (CSS)
PHP

- www.php.net

- PHP is a popular open-source, reflective programming language used mainly for developing server-side applications and dynamic web content. It was originally developed in 1994 and PHP stood for "Personal Home Page". In 2000 the Zend Engine was added and now the official meaning is the recursive acronym "PHP Hypertext Preprocessor".

- PHP is currently one of the most popular server-side scripting systems on the Web. It has been widely adopted since the release of version 4. On the desktop it has been favored by some new programmers as a rapid prototyping environment.
Installing PHP

- [www.php.net/downloads.php#v4](http://www.php.net/downloads.php#v4)
- We want to install PHP 4.4.0 and use the ZIP package
- Extract the PHP package (PHP 4.4.0 zip package). Extract the package in the directory where Apache was installed (C:\Program Files\Apache Group\Apache2). Change the newly created directory name to php (just to make it shorter).
- Then copy the file `php.ini-dist` in PHP directory to your windows directory (C:\Windows or C:\Winnt depends on where you installed Windows) and rename the file to `php.ini`. This is the PHP configuration file and we'll take a look what's in it later on.
- Next, move the `php4ts.dll` file from the newly created php directory into the sapi subdirectory.
Installing PHP

Apache doesn't know that you just installed PHP. We need to tell Apache about PHP and where to find it. Open the Apache configuration file in \Program Files\Apache Group\Apache2\conf\httpd.conf and add the following three lines:

```plaintext
LoadModule php4_module php/sapi/php4apache2.dll
AddType application/x-httpd-php .php
AddType application/x-httpd-php-source .phps
```

- The first line tells Apache where to load the dll required to execute PHP and the second line means that every file that ends with .php should be processed as a PHP file. The third line is added so that you can view your php file source code in the browser window.

- Now restart Apache for the changes to take effect (Start > Programs > Apache HTTP Server 2.0.50 > Control Apache Server > Restart).
Installing PHP

- Now we want to test PHP to verify our installation. Create a new file using Nvu, name it `hello.php`, and put it in document root directory (`C:\Program Files\Apache Group\Apache2\htdocs`). The content of this file should be:
  ```php
  <?php
  echo 'Hello World!';
  ?>
  ```
  (Note: Nvu will do the php encapsulation for you)

- Type `http://localhost/hello.php` on your browser's address bar and if everything works well you should see the traditional “Hello World!” display in your browser.

- Another common test is to create a new file named `test.php` and put it in document root directory. The content of this file is:
  ```php
  <?php
  phpinfo();
  ?>
  ```
Installing PHP

- `phpinfo()` is the infamous PHP function which will spit out all kinds of stuff about PHP and your server configuration. Type `http://localhost/test.php` on your browser's address bar and if everything works well you should see something like this:

```markdown
<table>
<thead>
<tr>
<th>System</th>
<th>Windows NT LIVE ROOM 5.1 build 2600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build Date</td>
<td>Jul 11 2005 13:06:47</td>
</tr>
<tr>
<td>Server API</td>
<td>Apache 2.0 Handler</td>
</tr>
<tr>
<td>Virtual Directory Support</td>
<td>enabled</td>
</tr>
<tr>
<td>Configuration File (php.ini) Path</td>
<td>C:\WINDOWS\php.ini</td>
</tr>
<tr>
<td>PHP API</td>
<td>20020018</td>
</tr>
<tr>
<td>PHP Extension</td>
<td>20020429</td>
</tr>
<tr>
<td>Zend Extension</td>
<td>20050606</td>
</tr>
<tr>
<td>Debug Build</td>
<td>no</td>
</tr>
</tbody>
</table>
```
MySQL

- MySQL is a multithreaded, multi-user, SQL (Structured Query Language) Database Management System (DBMS) with an estimated six million installations. MySQL is open source software available either under the GNU General Public License (GPL) or under other licenses when the GPL is inapplicable to the intended use.¹

- Unlike projects such as Apache, where the software is developed by a public community, and is essentially not owned by anyone, MySQL is owned and sponsored by a single for-profit firm, the Swedish company MySQL AB. The company develops and maintains the system, selling support and service contracts, as well as commercially-licensed copies of MySQL, and employing people all over the world who work together via the Internet. Two Swedes and a Finn founded MySQL AB: David Axmark, Allan Larsson and Michael "Monty" Widenius.²

¹ - en.wikipedia.org/wiki/MySQL
² – Wikipedia is based on MySQL. There are more than 200 million queries and 1.2 million updates per day with peak loads of 11,000 queries per second

www.mysql.com

Installing MySQL

- We want:
  - MySQL database server & standard clients
    - MySQL 4.1 -- Generally Available (GA) release (recommended)
- This should bring us to this page:
- Scroll down to this section:
Installing MySQL

- We will be downloading: mysql-essential-4.1.14-win32.msi
- Fill in the form if you want and go to the closest US mirror. The download will take a few minutes. When finished, you should have the .msi file on your desktop.
- Double-Click the newly downloaded .msi file
- Accept the typical installation
- You’ll be prompted to create a MySQL account (recommended) – monthly newsletter - save this info
- When the install finishes you’ll get a configuration option window. Be sure it is checked.
Installing MySQL

- We will be downloading: mysql-essential-4.1.14-win32.msi
- Fill in the form if you want and go to the closest US mirror. The download will take a few minutes. When finished, you should have the .msi file on your desktop.
- Double-Click the newly downloaded .msi file
- Accept the typical installation
- You’ll be prompted to create a MySQL account (recommended) – monthly newsletter - save this info
- When the install finishes you’ll get a configuration option window. Be sure it is checked.
Installing MySQL

Wizard Completed
Setup has finished installing MySQL Server 4.1. Click Finish to exit the wizard.

Configure the MySQL Server now
Use this option to generate an optimized MySQL config file, setup a Windows service running on a dedicated port and to set the password for the root account.
Installing MySQL
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration

Configure the MySQL Server 4.1 server instance.

Please select a configuration type.

- **Detailed Configuration**
  
  Choose this configuration type to create the optimal server setup for this machine.

- **Standard Configuration**
  
  Use this only on machines that do not already have a MySQL server installation. This will use a general purpose configuration for the server that can be tuned manually.
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Please select a server type. This will influence memory, disk and CPU usage.

- **Developer Machine**
  - This is a development machine, and many other applications will be run on it. MySQL Server should only use a minimal amount of memory.

- **Server Machine**
  - Several server applications will be running on this machine. Choose this option for web/application servers. MySQL will have medium memory usage.

- **Dedicated MySQL Server Machine**
  - This machine is dedicated to run the MySQL Database Server. No other servers, such as a web or mail server, will be run. MySQL will utilize up to all available memory.
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Please select the database usage.

- **Multifunctional Database**
  General purpose databases. This will optimize the server for the use of the fast transactional InnoDB storage engine and the high speed MyISAM storage engine.

- **Transactional Database Only**
  Optimized for application servers and transactional web applications. This will make InnoDB the main storage engine. Note that the MyISAM engine can still be used.

- **Non-Transactional Database Only**
  Suited for simple web applications, monitoring or logging applications as well as analysis programs. Only the non-transactional MyISAM storage engine will be activated.
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Please select the drive for the InnoDB datafile, if you do not want to use the default settings.

InnoDB Tablespace Settings
Please choose the drive and directory where the InnoDB tablespace should be placed.

C: Installation Path

Drive Info
Volume Name: NTFS
File System: 

39 GB Disk space Used
35.6 GB Free Disk space

< Back Next > Cancel
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Please set the approximate number of concurrent connections to the server.

- **Decision Support (DSS)/OLAP**
  Select this option for database applications that will not require a high number of concurrent connections. A number of 20 connections will be assumed.

- **Online Transaction Processing (OLTP)**
  Choose this option for highly concurrent applications that may have at any one time up to 500 active connections such as heavily loaded web servers.

- **Manual Setting**
  Please enter the approximate number of concurrent connections.
  Concurrent connections: 15

< Back  Next >  Cancel
Installing MySQL

MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Please set the networking options.

- **Enable TCP/IP Networking**
  Enable this to allow TCP/IP connections. When disabled, only local connections through named pipes are allowed.

  **Port Number:** 3306

  < Back  Next >  Cancel
Installing MySQL

MySQL Server Instance Configuration Wizard

Configure the MySQL Server 4.1 server instance.

Please select the default character set.

- **Standard Character Set**
  - Makes Latin1 the default charset. This character set is suited for English and other West European languages.

- **Best Support For Multilingualism**
  - Make UTF8 the default character set. This is the recommended character set for storing text in many different languages.

- **Manual Selected Default Character Set / Collation**
  - Please specify the character set to use.
  
  **Character Set:** latin1

[Screen capture of the MySQL Server Instance Configuration Wizard]
Installing MySQL
Installing MySQL

MySQL Server Instance Configuration Wizard

Configure the MySQL Server 4.1 server instance.

Please set the security options.

Modify Security Settings

New root password: ********** Enter the root password.

Confirm: ********** Retype the password.

Enable root access from remote machines

Create An Anonymous Account:

This option will create an anonymous account on this server. Please note that this can lead to an insecure system.

< Back  Next >  Cancel
Installing MySQL

MySQL Server Instance Configuration Wizard

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Ready to execute ...

- Prepare configuration
- Write configuration file
- Start service
- Apply security settings

Please press [Execute] to start the configuration.
Installing MySQL

MySQL Server Instance Configuration
Configure the MySQL Server 4.1 server instance.

Processing configuration ...

- Prepare configuration
- Write configuration file (C:\Program Files\MySQL\MySQL Server 4.1\my.ini)
- Start service
- Apply security settings

Configuration file created.
Windows service MySQL installed.
Service started successfully.
Security settings applied.

Press [Finish] to close the Wizard.
Installing MySQL

◆ Type “status” for info, then type “exit” to quit
Configuring PHP

- PHP stores all kinds of configuration information into a file called `php.ini`. Recall that we moved this to the `C:\Windows` directory.
- For now, *we do not needed to alter this file.*
- If you are interested in the *systems* side of DBMS, then read this file carefully.
- The following two slides are for reference only!
Configuring PHP

- **error_reporting** and **display_errors** – the default values that come with the installation are fine for development. When you go to production you’ll want to change to:
  ```
  error_reporting = E_NONE
  display_errors = Off
  ```
  This is because in a production environment you don’t want too much detail about your errors because it may reveal security error.

- **register_globals** – this value should be set to **Off**, which is the default, otherwise it exposes possible security problems.

- **session.save_path** – If you use sessions, something you may want to do as an advanced function, but not now, then this configuration tells PHP where to save the session data. You will need to set this value to an existing directory or you will not be able to use session. In Windows you can set this value as:
  ```
  session.save_path = C:\WINDOWS\Temp\n  ```
Configuring PHP

- **extension** – PHP4 comes with many extensions such as Java, SSL, LDAP, Oracle, etc. These are not turned on automatically. If you need to use the extension, first you need to specify the location of the extensions and then uncomment the extension you want.

For Windows you will need to uncomment the extension you want to use. In php.ini a comment is started using a semicolon (;). As an example if you want to use OpenSSL, then you must remove the semicolon at the beginning of:

```
;extension=php_openssl.dll
```

To
```
extension=php_openssl.dll
```

**Note:** MySQL and ODBC support is now built in, so *no dll is needed for it.*

- **max_execution_time** – the default is 30 seconds
WAMP Install Completed

- That’s it!
- You have finish installing and configuring Apache, MySQL and PHP on Windows
- Now we are ready to create, modify, and query tables using SQL under the Relational Model
Lecture Overview

◆ Setup WAMP Environment
◆ Using FORMS With PHP
◆ Connecting To MySQL With PHP
◆ Some Handy Tools
◆ Getting Data From MySQL With PHP
◆ Other Things We Can Do From Tutorial
Practicum: Apache, PHP & MySQL

🔹 I have been following this tutorial
Using Forms With PHP

- Take a look at the demo at:
  - Example: `form.php`
- Start with a blank document in Nvu
- Copy the source code from:
  - Source code: `form.phps`
    - into Nvu, but on the source tab (overwrite any that was originally there)
- Notice what happens when you go to the **Normal** or **Preview** Tabs
- Save as: `form.php` in your htdocs
- Try it
Lecture Overview

◆ Setup WAMP Environment
◆ Using FORMS With PHP
◆ Connecting To MySQL With PHP
◆ Some Handy Tools
◆ Getting Data From MySQL With PHP
◆ Other Things We Can Do From Tutorial
Starting MySQL

- Open the Command Line Client
- You’ll mostly likely be prompted for a password
- Then you should get something like this:
Connect To A Database - CLI
Connect to MySQL With PHP

- Opening a connection to MySQL database from PHP is easy. Just use the `mysql_connect()` function.
- Start with a blank document in Nvu.
- Copy the source code from the tutorial page (first section) into Nvu, but on the source tab (overwrite any that was originally there).
- Save as: `connect.php` in your htdocs.
- Try it.
- You may get something like this:
  
  *Warning*: `mysql_connect()`: Client does not support authentication protocol requested by server;
- I’m working on it. It has to do with the root password.
- For now, be sure password is blank.
Lecture Overview

◆ Setup WAMP Environment
◆ Using FORMS With PHP
◆ Connecting To MySQL With PHP
◆ Some Handy Tools
◆ Getting Data From MySQL With PHP
◆ Other Things We Can Do From Tutorial
MySQL Administrator

- We may need this to change root password to “blank”
MySQL Query Browser

- This is another handy tool
Lecture Overview

- Setup WAMP Environment
- Using FORMS With PHP
- Connecting To MySQL With PHP
- Some Handy Tools
- Getting Data From MySQL With PHP
- Other Things We Can Do From Tutorial
Get Data From MySQL With PHP

- Using PHP you can run a **MySQL SELECT** query to fetch the data out of the database. You have several options in fetching information from MySQL. PHP provides several functions for this. The one we’ll examine is **mysql_fetch_array()** which fetches a result row as an associative array.
- We proceed as before using Nvu and add the following code:

```php
$query = "SELECT sp_id, sex, price FROM pet";
$result = mysql_query($query);

while($row = mysql_fetch_array($result, MYSQL_ASSOC))
{
    echo "SP_ID :{$row['sp_id']} <br>" .
    "SEX : {$row['sex']} <br>" .
    "PRICE : {$row['price']} <br><br>";
}
```

- Save as: **getData.php** in your htdocs
Get Data From MySQL With PHP

- You should get a result that looks like this:

<table>
<thead>
<tr>
<th>SP_ID</th>
<th>SEX</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>23.99</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>19.99</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>35.99</td>
</tr>
</tbody>
</table>
Get Data From MySQL With PHP

◆ This reflect the rows that we inserted into the table “pet”
Lecture Overview

◆ Setup WAMP Environment
◆ Using FORMS With PHP
◆ Connecting To MySQL With PHP
◆ Some Handy Tools
◆ Getting Data From MySQL With PHP
◆ Other Things We Can Do From Tutorial
Practicum: Apache, PHP & MySQL

♦ Let’s Look At Some Other Things We Can Do
Shopping Cart Tutorial

- Here is a simple demo site
- You can download the code as a zip file
- Examine the code in small chunks and adapt it to your needs
- Keep it simple!

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>C240</td>
<td>$50,000</td>
</tr>
<tr>
<td></td>
<td>Coupe</td>
<td>$70,000</td>
</tr>
<tr>
<td></td>
<td>XC90</td>
<td>$80,000</td>
</tr>
<tr>
<td>Manga</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cart Content
- LX2500: $80,000
- Shipping: $5
- Total: $80,005

Go To Shopping Cart
Useful Websites

- [http://www.php-mysql-tutorial.com/](http://www.php-mysql-tutorial.com/) - the MySQL tutorial we have been using in class
Term Paper

- Due Next Saturday, Oct 8
- Should be about 3-4 pages (9 or 10 font)

Homework

- Read Chapter Seven
- Try What We Just Did In Class
Go Forth And Program…

…But get some rest!!!