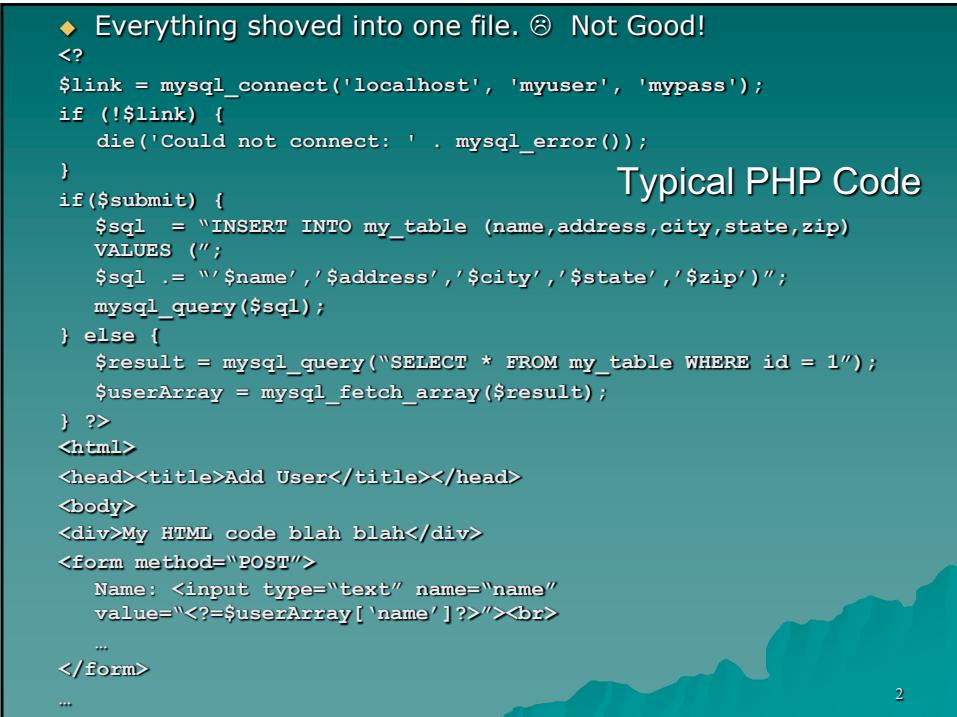




Web Development

Chapter 12. MVC & PHP Frameworks

1



◆ Everything shoved into one file. ☹ Not Good!

```
<?
$link = mysql_connect('localhost', 'myuser', 'mypass');
if (!$link) {
    die('Could not connect: ' . mysql_error());
}
if($submit) {
    $sql = "INSERT INTO my_table (name,address,city,state,zip)
VALUES ('";
$sql .= "'$name','$address','$city','$state','$zip')";
mysql_query($sql);
} else {
    $result = mysql_query("SELECT * FROM my_table WHERE id = 1");
    $userArray = mysql_fetch_array($result);
}
?>
<html>
<head><title>Add User</title></head>
<body>
<div>My HTML code blah blah</div>
<form method="POST">
    Name: <input type="text" name="name"
    value="<?=$userArray['name'] ?>"><br>
    ...
</form>
...

```

Typical PHP Code

2

2

1

```

<?
require_once("config.inc.php");
require_once("database.inc.php");

$dbh = dbConnect();
if($submit) {
    $sql = "INSERT INTO my_table
    (name,address,city,state,zip) VALUES (";
    $sql .= "'$name','$address','$city','$state','$zip')";
    $dbh->query($sql);
} else {
    $result = $dbh->query("SELECT * FROM my_table");
    $userArray = $dbh->fetchRow($result);
}
printHeader();?>
<div>My HTML code blah blah</div>
<form method="POST">
    Name: <input type="text" name="name"
    value=<?= $userArray[ 'name' ] ?>"><br>
    ...
</form>
...
<? printFooter(); ?>

```

Better but still not great

3

Content

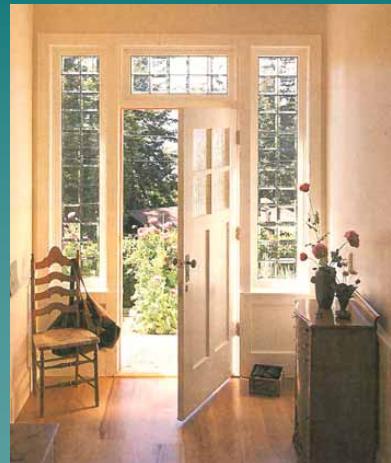
- ⇒ 1. Overview of Design Patterns
- 2. What is MVC architecture?
- 3. PHP Frameworks

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Patterns in Architecture



- ◆ Does this room makes you feel happy?
- ◆ Why?
 - Light (direction)
 - Proportions
 - Symmetry
 - Furniture
 - And more...

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What is a Design Pattern?

A description of a recurrent problem and of the core of possible solutions.

In Short, a solution for a typical problem

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Why do we need Patterns?

- ◆ Reusing design knowledge
 - Problems are not always unique. Reusing existing experience might be useful.
 - Patterns give us hints to “where to look for problems”.

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History of Design Patterns

Christopher Alexander <i>The Timeless Way of Building</i> <i>A Pattern Language: Towns, Buildings, Construction</i>	Architecture	1970'
Gang of Four (GoF) <i>Design Patterns: Elements of Reusable Object-Oriented Software</i>	Object Oriented Software Design	1995'
Many Authors	Other Areas: HCI, Organizational Behavior, Education, Concurrent Programming...	2007'

GoF: Gamma et al (E. Gamma, R. Helm, R. Johnson, J. Vlissides)

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Content

1. Overview of Design Pattern

⇒ 2. What is MVC architecture?

3. PHP Frameworks

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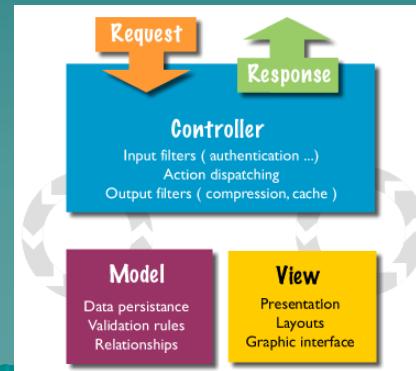
1. What is MVC Architecture?

- ◆ MVC is a design structure for separating representation from presentation using a subscribe/notify protocol
- ◆ The basic idea is to separate
 - where and how data (or more generally some state) is stored, i.e., the model
 - from how it is presented, i.e., the views
- ◆ Follows basic software engineering principles:
 - Separation of concerns
 - Abstraction

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1. What is MVC Architecture? (2)

- ◆ MVC consists of three kinds of objects
 - Model is the application object
 - View is its screen presentation
 - Controller defines the way the user interface reacts to user input



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1. What is MVC Architecture? (3)

- ◆ MVC decouples views and models by establishing a subscribe/notify protocol between them
 - whenever model changes it notifies the views that depend on it
 - in response each view gets an opportunity to update itself
- ◆ This architecture allows you to attach multiple views to a model
 - it is possible to create new views for a model without rewriting it

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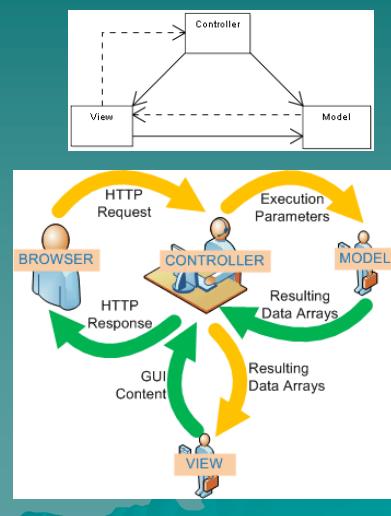
MVC Architecture in Web Applications

- ◆ Many web frameworks support web application development based on the MVC architecture
 - Ruby on Rails, Zend Framework for PHP, CakePHP, Spring Framework for Java, Struts Framework for Java, Django for Python, ...
- ◆ MVC architecture has become the standard way to structure web applications

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MVC Framework for Web Applications

- ◆ Model-View-Controller
- ◆ Separates:
 - **M: Data model**
 - **V: Presentation (UI)**
 - **C: Business logic**



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MVC Framework for Web Applications

- ◆ Model: Data model which is an abstract representation of the data stored in the backend database. Typically uses an object-relational mapping to map the class structure for the data model to the tables in the back-end database
- ◆ Views: These are responsible for rendering of the web pages, i.e., how is the data presented in user's browser
- ◆ Controllers: Controllers are basically event handlers that process incoming user requests. Based on a user request, they can update the data model, and create a new view to be presented to the user

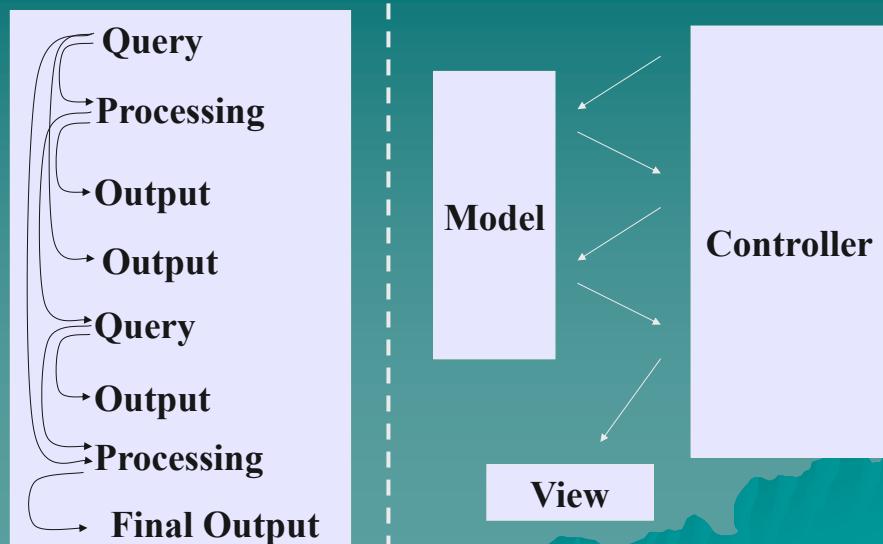
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Why use an MVC framework?

- ◆ Avoid “reinventing the wheel”
- ◆ Use proven, tested code
- ◆ Automation (ORM, generators)
- ◆ Maintainability
- ◆ “Plugin” functionality

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Flow: Traditional vs. MVC



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Content

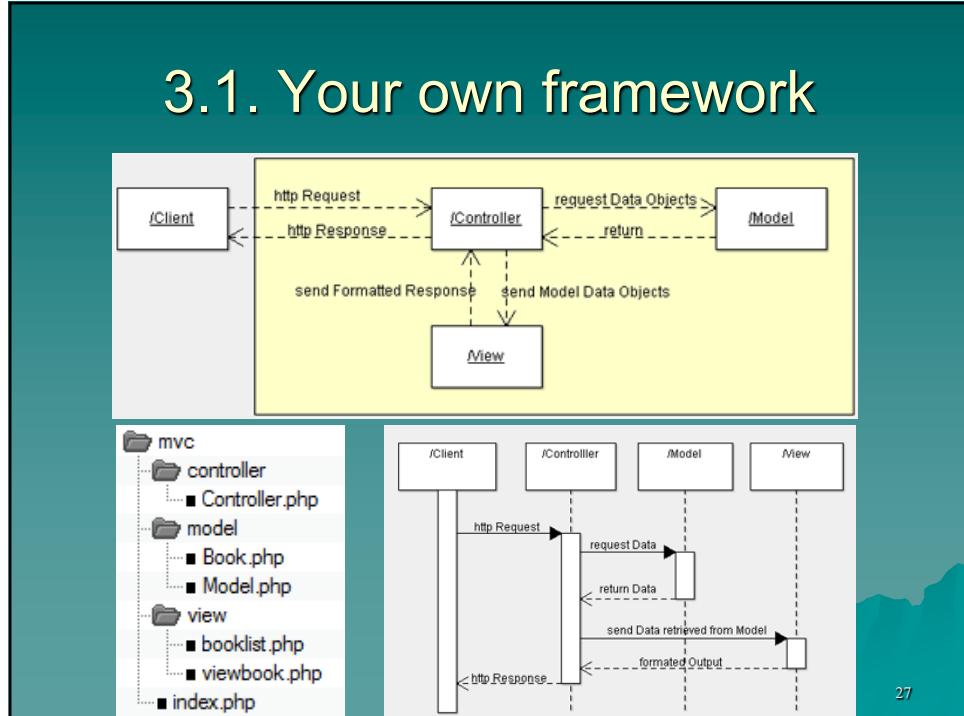
1. Overview of Design Patterns
2. What is MVC architecture?

⇒ **3. PHP Frameworks**

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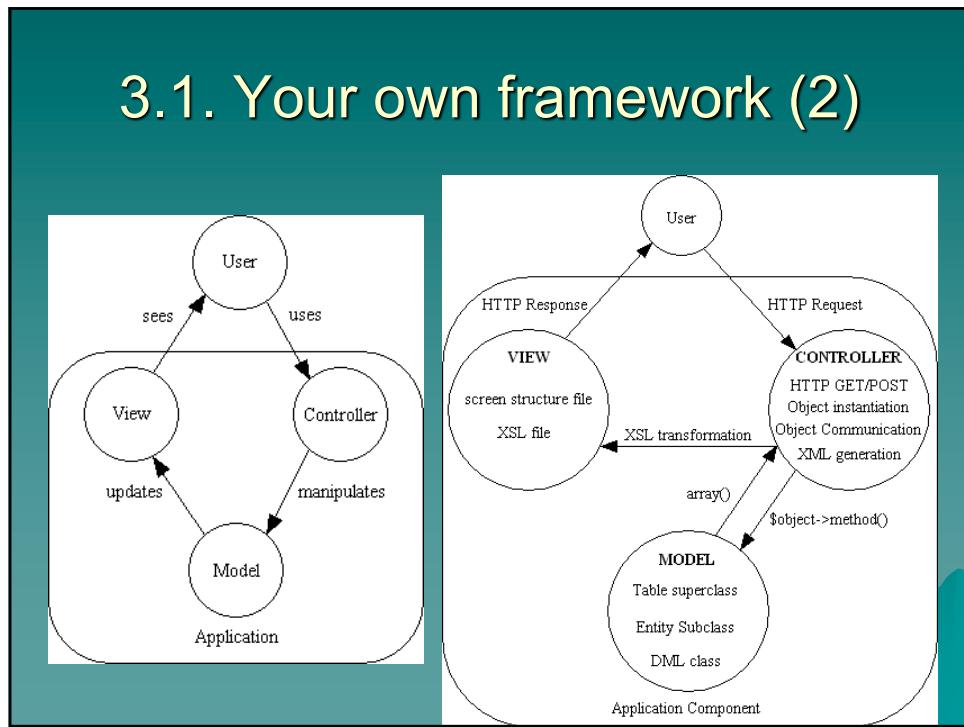
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3.1. Your own framework



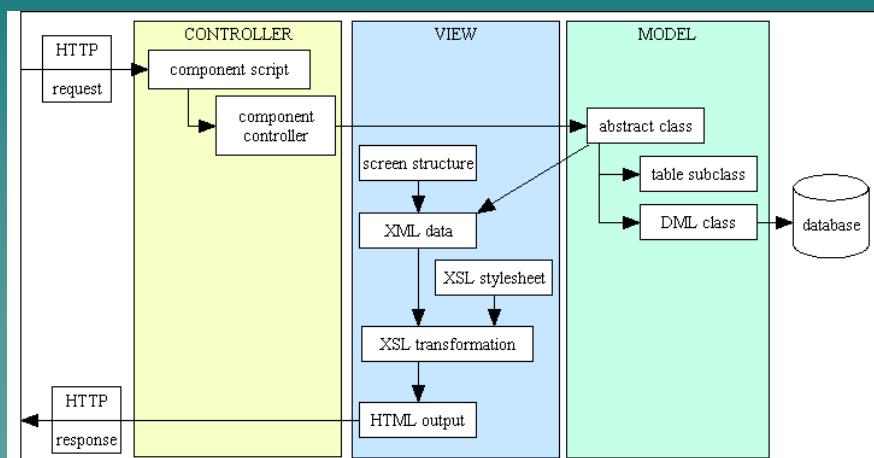
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3.1. Your own framework (2)



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3.1. Your own framework (2)



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3.2. Existed PHP Frameworks

- ◆ Zend Framework for PHP: <http://zend.com>
- ◆ Symfony: <http://symfony-project.org>
- ◆ CakePHP: <http://cakephp.org>
- ◆ CodeIgniter: <http://codeigniter.com>
- ◆ Xisc: <http://xisc.coom>

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Popular PHP MVC Frameworks

◆ CakePHP

- Documentation is somewhat lacking
- Apparently difficult for beginners

◆ Symfony

- Great documentation and community
- Easy to get started

◆ Zend

- Supported by Zend (official PHP company)
- More of a library than complete framework

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Should you use an existed MVC framework for your project?

- ◆ Are there **complex hierarchical relationships** in your data?
- ◆ Will this project need to be **maintained by more than one person** for more than a year?
- ◆ Do you need the ability to add advanced features like **AJAX without writing the code from scratch**?
- ◆ Probably Yes. (unless it's a throwaway)
 - Use a well-established framework with good documentation and a large community
- ◆ But I ask to NOT USE any framework

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Question?



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