Web Application Development
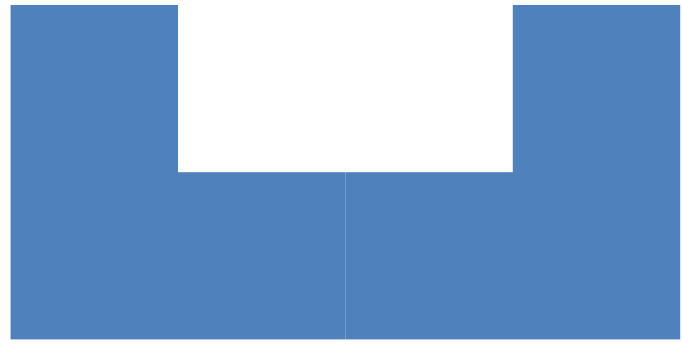
CodeIgniter

MVC Pattern

- The **Model** represents your data structure. Typically your model classes will contain functions that help you retrieve, insert, and update information in your database

- The **View** is the information that is being presented to a user. A View will normally be a web page, but in CodeIgniter, a view can also be a page fragment like a header or footer. It can also be an RSS page, or any other type of "page"

- The **Controller** serves as an *intermediary* between the Model, the View, and any other resources needed to process the HTTP request and generate a web page

MVC Pattern
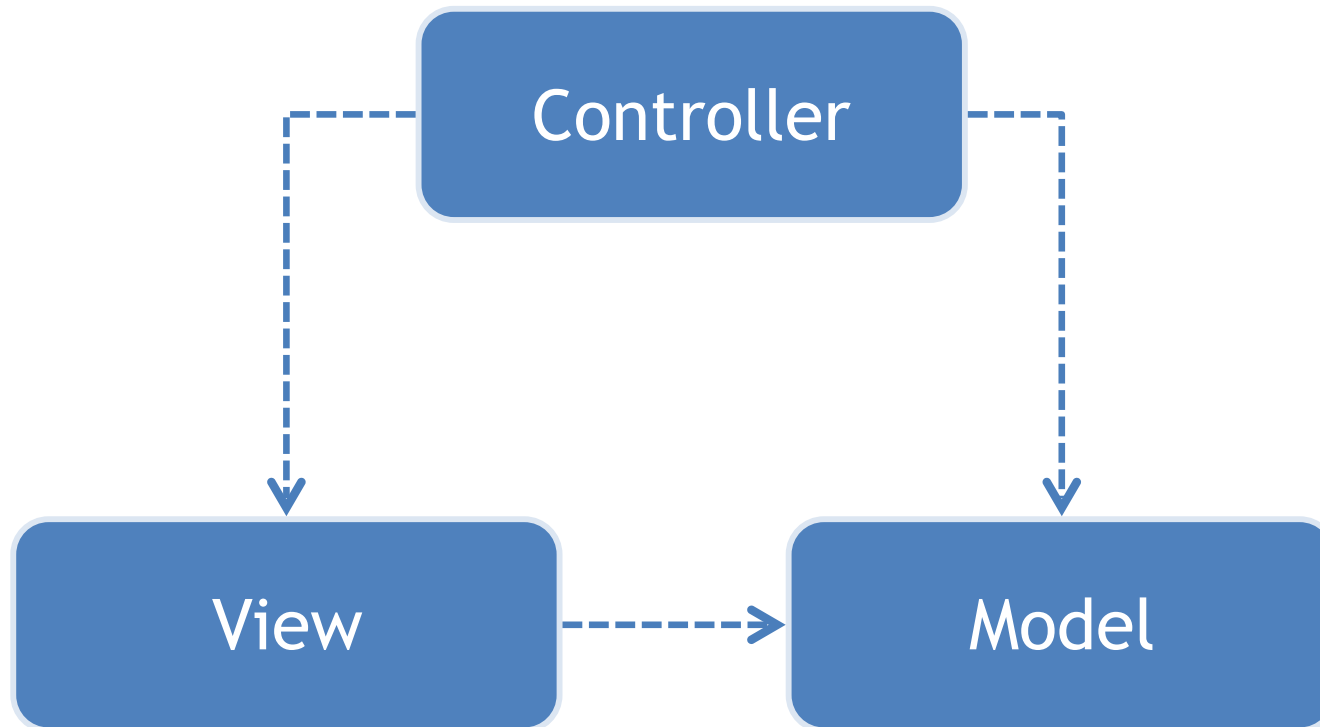
What is CodeIgniter

- CodeIgniter is a lightweight and open source **PHP application framework** for developing websites

- CodeIgniter is based on **MVC development pattern** for separating application logic from presentation. CodeIgniter allows to separate PHP scripting from your webpage

- CodeIgniter is widely used for easy development of websites nowadays

Installing CodeIgniter

- Step 1: Download CodeIgniter Framework
  http://www.codeigniter.com
  Unzip and change (if necessary) the "CodeIgniter" folder to the "application name"
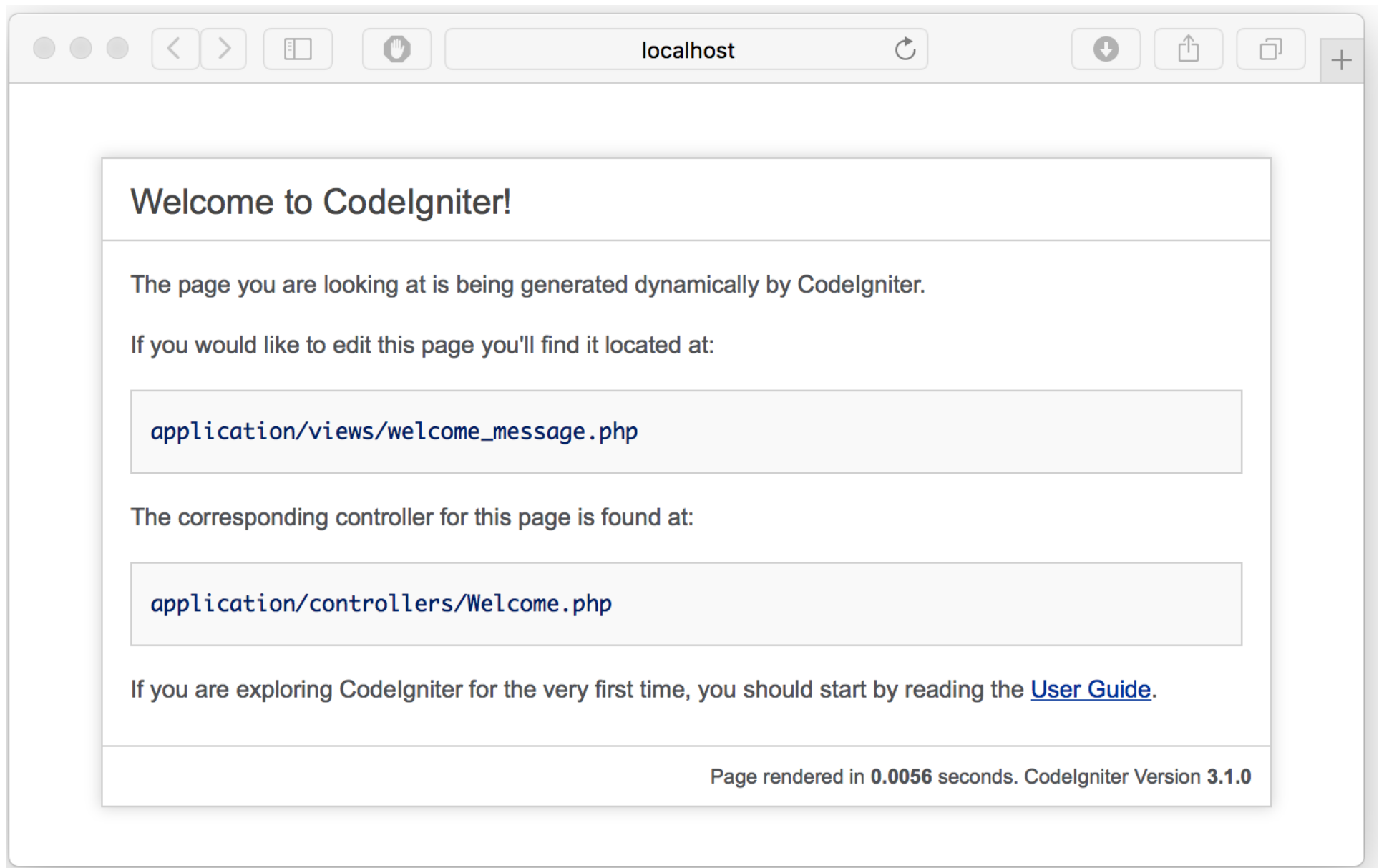
- Step 2: Copy CodeIgniter folder to PHP and MySQL enabled server. For example, copy it to the directory: C:/xampp/htdocs

Configuring CodeIgniter

- Open application configuration file: "C:/ xampp/htdocs/CodeIgniter/application/ config/config.php"
- Edit the base_url to point to your PHP server and CodeIgniter folder:

```
$config['base_url'] = 'http://localhost/CodeIgniter/';
```

Testing CodeIgniter

Welcome to CodeIgniter!

The page you are looking at is being generated dynamically by CodeIgniter.

If you would like to edit this page you'll find it located at:

    application/views/welcome_message.php

The corresponding controller for this page is found at:

    application/controllers/Welcome.php

If you are exploring CodeIgniter for the very first time, you should start by reading the User Guide.

Page rendered in **0.0056** seconds. CodeIgniter Version **3.1.0**

Database Configuration

- Open database configuration file: "C:/xampp/htdocs/ CodeIgniter/application/config/database.php"
- Edit your database connection parameters:
  - hostname: Indicate location of your database (e.g. "127.0.0.1")
  - username: Set username of your database (e.g. "root")
  - password: Set password of your database (e.g. "abc123")
  - database: Set name of your database (e.g. "usth")
  - dbdriver: Set type of your database (e.g. MySQL, MySQLi, Postgre SQL, MS SQL, etc.)

Database Configuration

```php
$db['default'] = array(
    'dsn'      => '',
    'hostname' => '127.0.0.1',
    'username' => 'root',
    'password' => 'abc123',
    'database' => 'usth',
    'dbdriver' => 'mysqli',
    'dbprefix' => '',
    'pconnect' => FALSE,
    'db_debug' => (ENVIRONMENT !== 'production'),
    'cache_on' => FALSE,
    'cachedir' => '',
    'char_set' => 'utf8',
    'dbcollat' => 'utf8_general_ci',
    'swap_pre' => '',
    'encrypt' => FALSE,
    'compress' => FALSE,
    'stricton' => FALSE,
    'failover' => array(),
    'save_queries' => TRUE
);
```

Basic Concepts

- Controllers
- Views
- Models

Controllers

- A controller is a class file that is named in a way that can be associated with a URI

  example.com/index.php/blog/

- CodeIgniter would attempt to find a controller named Blog.php and load it

```php
<?php
    class Blog extends CI_Controller {
        public function index(){
            echo 'Hello World!';
        }
    }
?>
```

Controllers

```php
<?php
    class Blog extends CI_Controller {
        public function index(){
            echo 'Hello World!';
        }

        public function comment(){
            echo 'Your comments are welcome';
        }
    }
?>
```

Passing Parameters

```php
<?php
    class Blog extends CI_Controller {
        public function index(){
            echo 'Hello World!';
        }

        public function comment($str){
            echo 'Hello' . $str;
        }
    }
?>
```

Check out: http://.../blog/comment/ICT5Class

Passing Parameters

```php
<?php
    class Blog extends CI_Controller {
        public function index(){
            echo 'Hello World!';
        }

        public function comment($str1,$str2){
            echo $str1 ." ". $str2;
        }
    }
?>
```
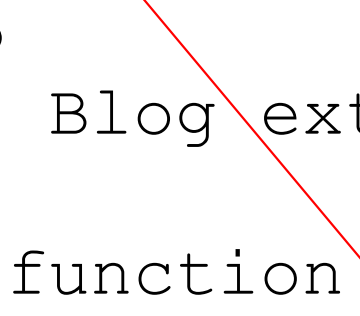
Check out: http://.../blog/comment/Hello/World

Private Function

A private function is a function not accessible via Web browsers

```php
<?php
class Blog extends CI_Controller {

        function _utility(){
                return '1';
        }
}
?>
```

Private Function

```php
<?php
    class Blog extends CI_Controller {
        // create a public wrapper to call your private method
        public function index(){
            $output = $this->_utility();
            echo $output;
        }

        function _utility(){
            return "1";
        }
    }
?>
```

Folders for Controllers

- We may have folders for controller inside *application/controllers/*

- The URIs must include sub-folders

  http://localhost/CodeIgniter/index.php/ test/Blog

Constructors

```php
<?php
class Blog extends CI_Controller {
    function __construct()
    {
        parent::__construct();
        // Your own constructor code
        $this->load->helper('url');
        $this->load->database();
    }
}
?>
```

Views

- A *view* can be a web page, or a page fragment, like a header, footer, sidebar, etc.

- Views are never called directly, they must be loaded by a controller

Controller-View

application/views/blog_view

```html
<html>
<head>
<title>My Blog</title>
</head>
<body>
        <h1>Welcome to my Blog!</h1>
</body>
</html>
```

application/controllers/Blog.php

```php
<?php
class Blog extends CI_Controller {

        function index()
        {
                $this->load->view('blog_view');
        }

}
?>
```

Loading Multiple Views

```php
<?php

class Blog extends CI_Controller {
    function index()
    {
        $this->load->view('blog_view1');
        $this->load->view('blog_view2');
        $this->load->view('blog_view3');
    }
}

?>
```

Adding Dynamic Data to the View

```html
<html>
<head>
<title>Blog</title>
</head>
<body>
        <h1>Welcome to my Blog!</h1>
        <?php echo $str?>
</body>
</html>
```

```php
<?php
class Blog extends CI_Controller {

    function index()
    {
        $data['str'] = 'Testing Dynamic View';
        $this->load->view('blog_view', $data);
    }
}
?>
```

Adding Dynamic Data to the View

```php
<?php
class Blog extends CI_Controller {
        function index()
        {

            $data['todo_list'] = array('Clean House', 'Call Mom', 'Play Game');
            $data['heading'] = "My Real Heading";
            $this->load->view('blog_view', $data);

        }

}
?>
```

```php
<body>
<h1><?php echo $heading;?></h1>
<h3>My Todo List</h3>
<ul>
        <?php foreach ($todo_list as $item):?>
                <li><?php echo $item;?></li>
        <?php endforeach;?>
</ul>
</body>
```

Folders for Views

- We may have folders for views inside *application/views/*

- If your view is located in a sub-directory, include the relative path from your view directory

$this->load->view('folder_name/*file_name*');

Models

- Models are **PHP classes** that are designed to work with information in your database
- Example: You might have a **model class** that contains functions to insert, update, and retrieve your **blog data**

Models

```php
class Blog_model extends CI_Model {
    var $title   = '';
    var $content = '';
    function __construct()  {
        parent::__construct();
    }
    function get_entries() {
        $query = $this->db->get('entries');
        return $query->result();
    }
    function insert_entry($t, $c){
        $this->title   = $t;
        $this->content = $c;
        $this->db->insert('entries', $this);
    }
}
```

Loading a Model

- Load a model with model_name via a controller, then use model name to call model methods

  ```
  $this->load->model('Model_name');
  $this->Model_name->function();
  ```

- Assign model to a different object name via second parameter of the loading method

  ```
  $this->load->model('Model_name','object_name');
  $this->Object_name->function();
  ```

Manipulating Database

```php
class Blog_controller extends CI_Controller {
  function __construct() {
    parent::__construct();
    $this->load->database();
  }
  function blog(){
    // load model
    $this->load->model('Blog_model');
    // assign input data
    $this->title = "Chatting blog";
    $this->content = "About how to study successfully";
    // call insert method in the loaded model
    $this->Blog_model->insert_entry($this->title,$this->content);
  }
}
```

Performing Insert SQL Query

Manipulating Database

```php
class Blog_controller extends CI_Controller {
  function __construct() {
    parent::__construct();
    $this->load->database();
  }
  function blog(){
    // load model
    $this->load->model('Blog_model');
    // get query results
    $data['query'] = $this->Blog_model->get_entries();
    // display query results
    $this->load->view('blog_view',$data);
  }
}
```

Performing Select SQL Query

Manipulate Database

```php
<html lang = "en">
    <head>
        <meta charset = "utf-8">
        <title>Blog</title>
    </head>
    <body>
        <table border = "1">
            <?php
                $i = 1;
                echo "<tr>";
                echo "<td>No.</td>";
                echo "<td>Title</td>";
                echo "<td>Content</td>";
                echo "<tr>";

                foreach($query as $r) {
                    echo "<tr>";
                    echo "<td>".$i++."</td>";
                    echo "<td>".$r->title."</td>";
                    echo "<td>".$r->content."</td>";
                    echo "<tr>";
                }
            ?>
        </table>
    </body>
</html>
```

blog_view.php