OOP and Ajax in PHP

ITCS 210 Web Programming

Class Objectives

- Students would be able to know concepts of object oriented programming (OOP) in PHP, AJAX, the difference between Synchronous and Asynchronous, model-view-controller (MVC) architecture paradigm.
- Students should be able to apply AJAX in web applications.
- Knowing frameworks that use to develop web application based on MVC.

OOP in PHP
and Built-in functions

Require and Include

- You can insert the content of one PHP file into another PHP file before the server executes it, with the include() or require() function.

- **require** – includes and evaluates a specific file; **failure → Fatal Error**

```
<?php
    require 'header.php';
?>
```

- **include** - includes and evaluates a specific file; **failure → a Warning**

```
<?php
    include 'header.php';
?>
```

require_once and include_once

- **require_once** – same as require except if the file has already been included, it will not be included again

```
<?php
    require_once 'header.php';
?>
```

- **include_once** - same as include except if the file has already been included, it will not be included again

```
<?php
    include_once 'header.php';
?>
```

- Use when the same file might be included and evaluated more than once during a particular execution of a script, and you want to be sure that it is included exactly once to avoid problems with function redefinitions, variable value reassignments, etc.

Example of include

Main file: index.php

```
<html>
<body>
<div class="leftmenu">
<?php include("Menu.php"); ?>
</div>
<h1>Welcome to my home
page.</h1></body>
</html>
```

Menu.php

```
<a href="/default.php">Home</a>
<a href="/about.php">About Us</a>
<a href="/contact.php">Contact Us</a>
```

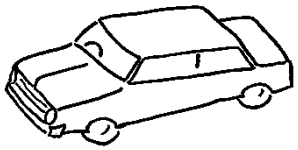
Result in browser after PHP codes are executed

```
<html>
<body>
<div class="leftmenu">
<a href="/default.php">Home</a>
<a href="/about.php">About Us</a>
<a href="/contact.php">Contact Us</a>
</div>
<h1>Welcome to my home page!</h1>
</body>
</html>
```

Object

- An object is a bunch of variables and functions all lumped into a single entity.
- The object can then be called rather than calling the variables or functions themselves. Within an object there are **methods** and **properties**.
- The methods are functions that manipulate data within the object.
- The properties are variables that hold information about the object.

Class



Class: vehicle

- Class is the blueprint for user defined object
- In OOP, the class holds the definition, and the object holds the value.
- Class can contain
  - Object Property
  - Method
- For clearer idea about class and object

All vehicles share similar characteristics

number of doors
color
price

} **Properties**

All vehicles do similar things

Drive
turn left
turn right
stop

} **Methods**

2 doors
Red
$34,000

Drive
turn left
turn right
stop

Object: mini cooper

5 doors
Blue
$29,285

Drive
turn left
turn right
stop

Object: Ford

Basic Syntax

- Creating a new object

```
$someVariable = new SomeClassDefiningAnObject;
```

- Executing a method in the object

```
$someVariable->someMethod($someArgumentJustLikeARegularFunction);
```

- Assigning the return value to a variable

```
$returnValue = $someVariable->someMethodThatReturnsSomething();
```

- Setting and retrieving the current property value

```
$someVariable->someProperty = 'SomeValue';
$currentValue = $someVariable->someProperty;
```

Defining Class

```
1.class Dog
2.{
3.        public $hungry = 'yeah.';
4.
5.        function eat($food)
6.        {
7.                $this->hungry = 'not so much.';
8.        }
9.}
```

Property

Method

```
1.$dog = new Dog;
2.echo $dog->hungry;
3.
4.$dog->eat('cookie');
5.echo $dog->hungry;
```

Output

```
yeah.
not so much.
```

Class

- **Syntax**

```
class classname
{
 var $property_name;          ← Object Property

  function __construct(parameters)
  {    code   }                ← Constructor
                               or
                               function classname(parameters)
                               {    code   }
 function __destruct()
 {    code   }                 ← Destructor

 function func_name()
 {    code   }                 ← Method
}
```

- Constructor is a method automatically called when an object is created. It is usually used for object property initialization.
- Destructor is a method automatically called when all references to a particular object are removed or when the object is explicitly destroyed or in any order in shutdown sequence.

Example

```
class student
{
 var $student_id;
 function student($param) //constructor for PHP Version < 5.3.2
 {
      $this -> student_id = $param;
 } //end constructor

 function show_id(){
      echo "student id = " . $this -> student_id;
 } //end function
}
$stu = new student(46330001);     // create instance
$stu -> show_id();                // show student id
```

How to use

- Use class by creating object

Syntax: $objName = new className(parameter);

```
$Kitty = new student(5288999);
```

- Refer to an property in the class using the symbol

Syntax: $objName -> propertyName = “value”;

```
$Kitty -> student_id = “5288000”;        //change value of property
```

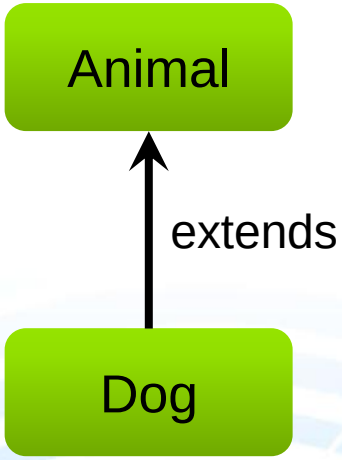
- Use method in the class

Syntax: $objName -> methodName(parameter);

```
$Kitty -> show_id(); //call a method
```

Inheritance

```
1.class Animal   {
2.    public $hungry = 'yeah.';
3.
4.    function eat($food)  {
5.        $this->hungry = 'not so much.';
6.    }
7.}
8.
9.class Dog extends Animal   {
10.    function eat($food)  {
11.        if($food == 'cookie')  {
12.            $this->hungry = 'not so much.';
13.        }
14.        else   {
15.            echo 'barf, I only like cookies!';
16.        }
17.    }
18.}
```



Constructor

```
1.class Dog extends Animal
2.{
3.        public $breed;
4.
5.        function __construct($breed){
6.                $this->breed = $breed;
7.        }
8.
9.        function eat($food){
10.                if($food == 'cookie'){
11.                        $this->hungry = 'not so much.';
12.                }
13.                else {
14.                        echo 'barf, I only like cookies!';
15.                }
16.        }
17.}
```

Two Underscores

```
$dog = new Dog('Golden Retriever');

$dog->breed = ‘Golden Retriever';
```

Scope Resolution Operator

```
12. class Dog extends Animal {
13.     public $breed;
14.
15.     function __construct($breed){
16.         $this->breed = $breed;
17.
18.         Animal:: __construct();
19.
20.     }
21.
22.     function eat($food){
23.         if($food == 'cookie'){
            Animal::eat($food);
            }
26.         else {
27.             echo 'barf, I only like cookies!';
28.         }
29.     }
30. }
31.
32. $dog = new Dog('Rotweiler');
33. $dog->eat('cookie');
34. echo $dog->hungry;
```

```
1.class Animal {
2.     public $hungry = 'yeah.';
3.
4.     function __construct(){
5.         echo 'I am an animal.';
6.     }
7.
8.     function eat($food){
9.         $this->hungry = 'not so much.';
10.     }
11.}
```

Overwritten

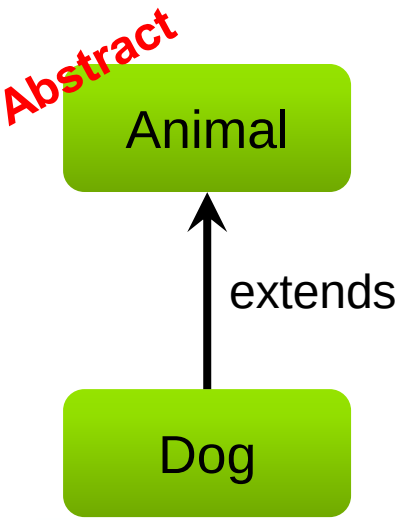
Perform static calls to methods & class members

Output

```
I am an animal.
not so much.
```

Abstract Class

```
1.abstract class Animal {
2.    public $hungry = 'yeah.';
3.
4.    abstract public function eat($food);
5.}
6.class Dog extends Animal{
7.    function eat($food){
8.        if($food == 'cookie'){
9.            $this->hungry = 'not so much.';
10.        }
11.        else {
12.            echo 'barf, I only like cookies!';
13.        }
14.    }
15.}
16.$dog = new Dog();
17.echo $dog->hungry;
18.$dog->eat('peanut');
```

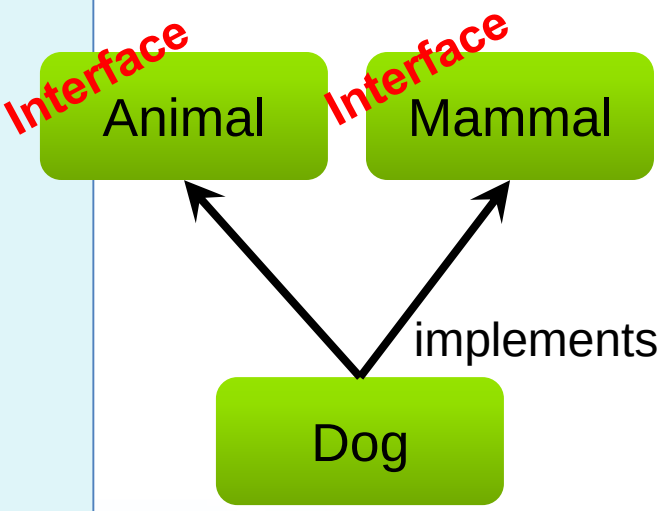


Output

```
yeah.
barf, I only like cookies!.
```

Interfaces

```
1.interface Animal {
2.    public function eat($food);
3.}
4.interface Mammal {
5.    public function giveBirth();
6.}
7.class Dog implements Animal, Mammal{
8.    public $gender = 'male';
9.
10.    function eat($food){
11.        if($food == 'cookie'){
12.            $this->hungry = 'not so much.';
13.        }
14.        else {
15.            echo 'barf, I only like cookies!';
16.        }
17.    }
18.    function giveBirth(){
19.        if($this->gender == 'male'){
20.            echo 'I can\'t, I am a boy :P';
21.        }
22.        else {
23.            echo 'I\'m not even pregnant yet.';
24.        }
25.    }
26.}
```



Destructor

```
1.class Example {
2.    private $_name;
3.
4.    public function __construct($name){
5.        $this->_name = $name;
6.    }
7.    function __destruct() {
8.        echo "Destructing object '$this->_name'.";
9.    }
10.}
11.
12.$objectOne = new Example('Object one');
13.$objectTwo = new Example('Object two');
14.unset($objectOne);
15.echo 'Script still running.';
16.unset($objectTwo);
```

Output

```
Destructing object 'Object one'.
Script still running.
Destructing object 'Object two'.
```

Visibility

```
1.class Teeth {
2.    protected $_colour = 'white';
3.
4.    public function stain(){
5.        $this->_colour = 'yellow';
6.    }
7.}
8.class Dog {
9.    public $teeth;
10.
11.    public function __construct(){
12.        $this->teeth = new Teeth();
13.    }
14.    public function eat($food){
15.        if($food == 'cookie'){
16.            $this->hungry = 'not so much.';
17.            //Attempt to turn teeth green:
18.            $this->teeth->_colour = 'green';
19.        }
20.        else {
21.            echo 'barf, I only like cookies!';
22.        }
23.    }
24.}
25.$dog = new Dog();
```

- **Public**:
available to every classes

- **Protected**:
available to parent and child classes

- **Private**:
Available to its own class

Output

```
Fatal error: Cannot access protected property
Teeth::$_colour
```

Constants

```
1.class Dog{
2.    const NUMBER_OF_LEGS = '4';
3.
4.    public function __construct(){
5.        echo 'I have '.self::NUMBER_OF_LEGS.' legs,
6.        and you can\'t take that away from me!';
7.    }
8.}
9.$dog = new Dog();
```

$this -> NUMBER_OF_LEGS ✗

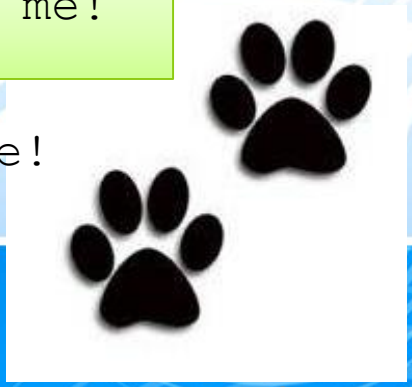
$dog -> NUMBER_OF_LEGS ✗

PHP is looking for a non-existent object

Output

```
I have 4 legs, and you can't take that away from me!
```

```
I have legs, and you can't take that away from me!
```



Exception

```
1.class LiarException extends Exception {}
2.
3.try {
4.    if($doggy->talk() == 'Doggie likes broccoli.'){
5.        throw new LiarException(
6.            'Doggie is a big fat liar. He only likes cookies.'
7.        );
8.    }
9.    else {
10.        throw new Exception('Just because we can.');
11.    }
12.    echo 'An exception was thrown, so this will never print...';
13.}
14.catch(LiarException $e){
15.    echo "Somebody lied about something: {$e->getMessage()}";
16.}
17.catch(Exception $e){
18.    echo "Somebody threw an exception: {$e->getMessage()}";
19.}
```

```
1.class Dog {
2.    public function talk(){
3.        return 'Doggie likes something.';
4.    }...
```

Output

```
Somebody threw an exception: Just because we can.
```

ToString

- __toString method can be used to show a string from an object

```
1.class Dog
2.{
3.    function __toString()
4.    {
5.        return 'I am Dog.';
6.    }
7.}
8.$dog = new Dog();
9.echo $dog;
```

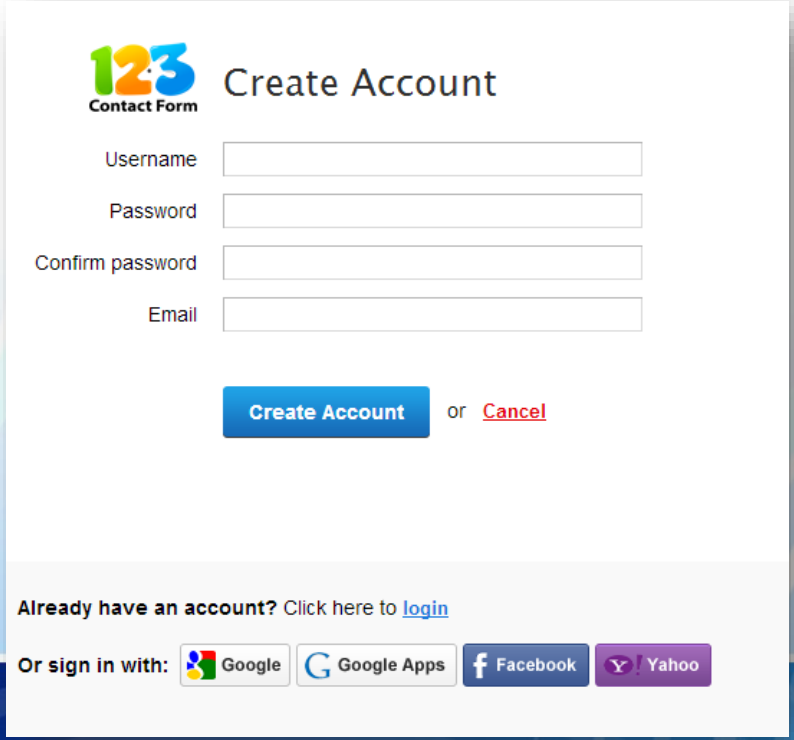
Output

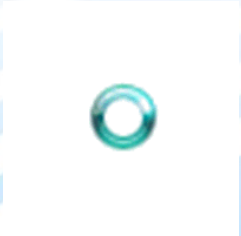
```
I am Dog.

fatal error: Object of class Dog could not be converted to string
```

AJAX in PHP

AJAX

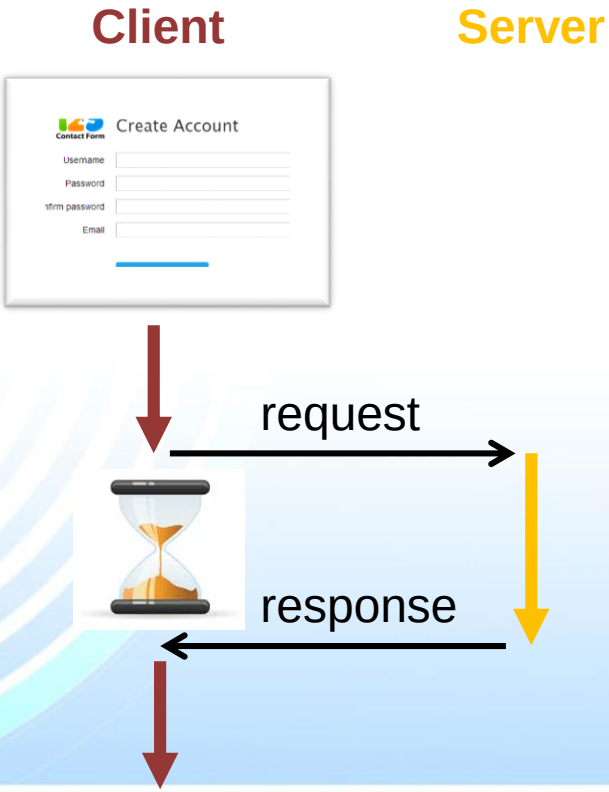
- Asynchronous JavaScript and XML
- To build asynchronous web application



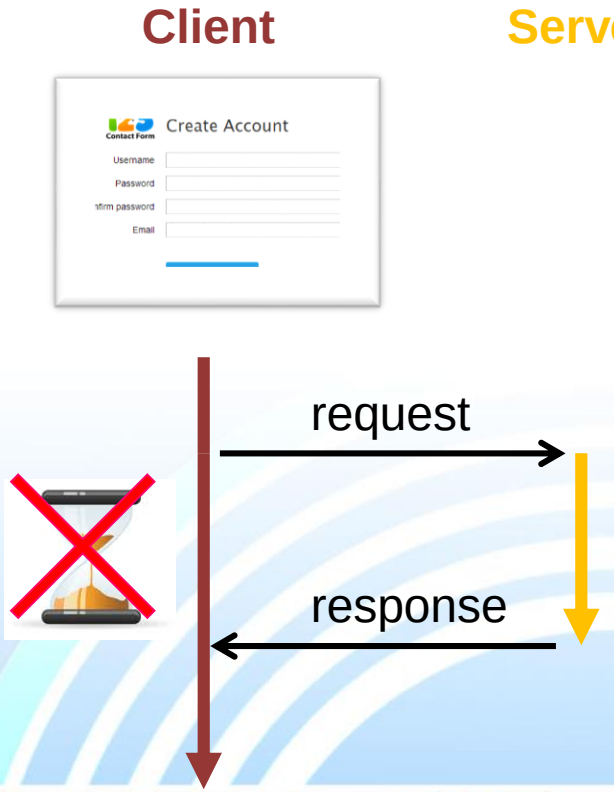


AJAX: Asyncronous

- Synchronous

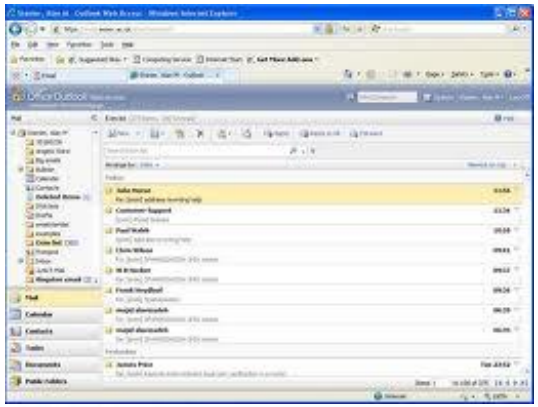


- Asynchronous

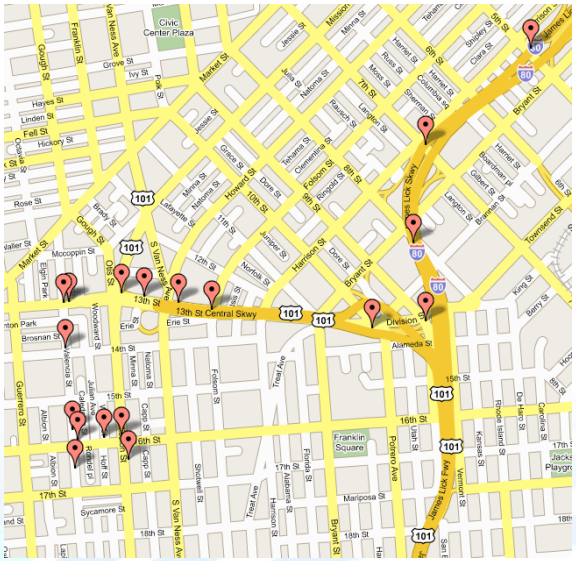


Ajax: Example

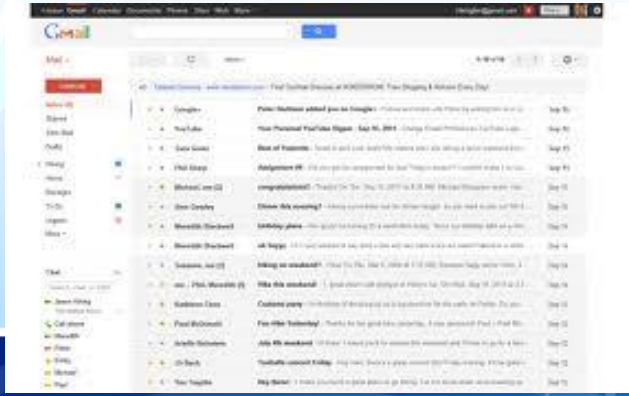
- Microsoft Outlook Web Access



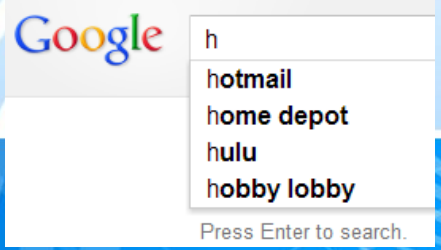
- Google Maps



- Gmail



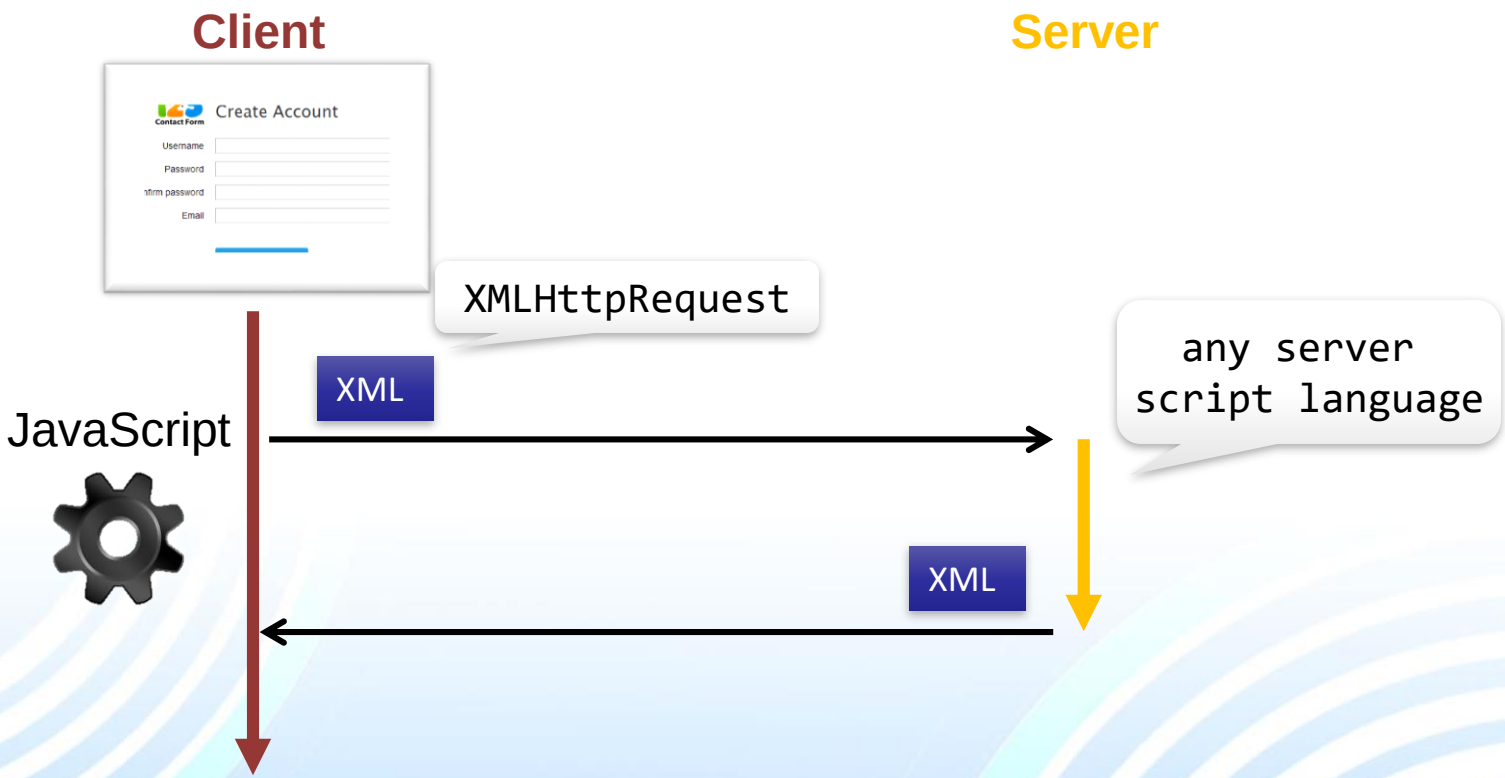
- Google Suggest



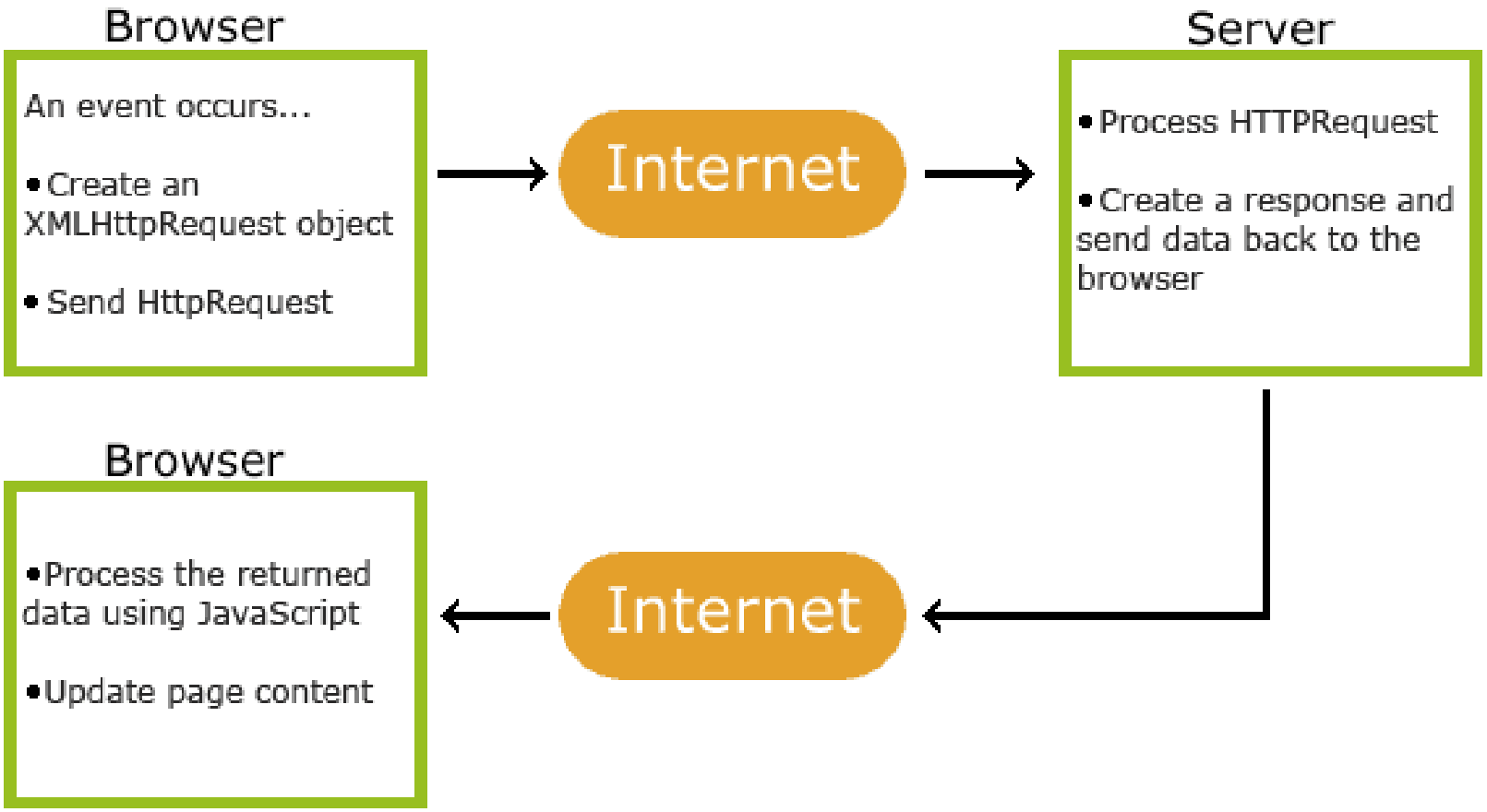
Ajax

- The Ajax engine works within the Web browser
- Through JavaScript and the DOM (Document Object Model)
- XML is commonly used as the format for receiving server data (In this lecture, we will show response in text)
- AJAX is a web browser technology independent of web server software
- A user can continue to use the application while the client program requests information from the server in the background

Ajax: JavaScript and XML



How Ajax works



How Ajax works

1. An event occurs in a web page (the page is loaded, a button is clicked)
2. An XMLHttpRequest object is created by JavaScript
3. The XMLHttpRequest object sends a request to a web server
4. The server processes the request
5. The server sends a response back to the web page
6. The response is read by JavaScript
7. Proper action (like page update) is performed by JavaScript

Ajax: Create XMLHttpRequest Object

- The XMLHttpRequest Object can be used to exchange data with a server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.
- Create an XMLHttpRequest Object

variable = new XMLHttpRequest();

Example

var xhttp = new XMLHttpRequest();

XMLHttpRequest Object Methods

Method	Description
new XMLHttpRequest()	Creates a new XMLHttpRequest object
abort()	Cancels the current request
getAllResponseHeaders()	Returns header information
getResponseHeader()	Returns specific header information
open(*method, url, async, user, psw*)	Specifies the request *method*: the request type GET or POST *url*: the file location *async*: true (asynchronous) or false (synchronous) *user*: optional user name *psw*: optional password
send()	Sends the request to the server Used for GET requests
send(*string*)	Sends the request to the server. Used for POST requests
setRequestHeader()	Adds a label/value pair to the header to be sent

XMLHttpRequest Object Properties

Property	Description
onreadystatechange	Defines a function to be called when the readyState property changes
readyState	Holds the status of the XMLHttpRequest. 0: request not initialized 1: server connection established 2: request received 3: processing request 4: request finished and response is ready
responseText	Returns the response data as a string
responseXML	Returns the response data as XML data
status	Returns the status-number of a request 200: "OK" 403: "Forbidden" 404: "Not Found" For a complete list go to the Http Messages Reference
statusText	Returns the status-text (e.g. "OK" or "Not Found")

Ajax: Send a Request to a Server

```
xmlhttp.open("GET","getcd.php?q="+str,true);
xmlhttp.send();
```

Syntax

```
open(method, url, async)
```

- *method*: the type of request: GET or POST
  url: the location of the file on the server
  async: true (asynchronous) or false (synchronous)
- GET : simpler & faster
- POST: sending large amount of data, secure

GET or POST?

- GET is simpler and faster than POST, and can be used in most cases.
- However, always use POST requests when:
  - A cached file is not an option (update a file or database on the server).
  - Sending a large amount of data to the server (POST has no size limitations).
  - Sending user input (which can contain unknown characters), POST is more robust and secure than GET.

Ajax: Send a Request to a Server

Get Request

- A simple GET request:

```
xhttp.open("GET", "demo_get.php", true);
xhttp.send();
```

- If you want to send information with the GET method, add the information to the URL:

```
xhttp.open("GET", "demo_get2.php?fname=Henry&lname=Ford", true);
xhttp.send();
```

Ajax: Send a Request to a Server

Post Request

- A simple POST request:

```
xhttp.open("POST", "demo_post.php", true);
xhttp.send();
```

- To POST data like an HTML form, add an HTTP header with setRequestHeader(). Specify the data you want to send in the send() method:

```
xhttp.open("POST", "ajax_test.php", true);
xhttp.setRequestHeader("Content-type", "application/x-www-form-urlencoded");
xhttp.send("fname=Henry&lname=Ford");
```

Ajax: Send a Request to a Server

```
xhttp.open("GET", "ajax_test.php", true);
```

- The url parameter of the open() method, is an address to a file on a server
- Server requests should be sent asynchronously. The async parameter of the open() method should be set to true
  - execute other scripts while waiting for server response
  - deal with the response after the response is ready

Ajax: Server Response

- Server Response Properties

Property	Description
responseText	get the response data as a string
responseXML	get the response data as XML data

- Server Response Methods

Method	Description
getResponseHeader()	Returns specific header information from the server resource
getAllResponseHeaders()	Returns all the header information from the server resource

Ajax: Server Response

- The onreadystatechange function is called every time the readyState changes.
- When readyState is 4 and status is 200, the response is ready.

```
function loadDoc() {
    var xhttp = new XMLHttpRequest();
    xhttp.onreadystatechange = function() {
        if (this.readyState == 4 && this.status == 200) {
            document.getElementById("demo").innerHTML =
            this.responseText;
        }
    };
    xhttp.open("GET", "ajax_info.txt", true);
    xhttp.send();
}
```

The responseText Property

```
<!DOCTYPE html>
<html>
<body>

<div id="demo">
<h2>The XMLHttpRequest Object</h2>
<button type="button" onclick="loadDoc()">Change Content</button>
</div>

<script>
function loadDoc() {
  var xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("demo").innerHTML = this.responseText;
    }
  };
  xhttp.open("GET", "ajax_info.txt", true);
  xhttp.send();
}
</script>

</body>
</html>
```

The XMLHttpRequest Object

Change Content

Ajax_info.txt

AJAX

AJAX is not a programming language.

AJAX is a technique for accessing web servers from a web page.

AJAX stands for Asynchronous JavaScript And XML.

The responseXML Property

```
<!DOCTYPE html>
<html>
<body>
<div id="demo">
<h2>The XMLHttpRequest Object</h2>
<button type="button" onclick="loadXML()">Change Content</button>
</div>
<script>
function loadXML() {
  var xhttp, xmlDoc, txt, x, i;
  xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
  if (this.readyState == 4 && this.status == 200) {
    xmlDoc = this.responseXML;
    txt = "";
    x = xmlDoc.getElementsByTagName("ARTIST");
    for (i = 0; i < x.length; i++) {
      txt = txt + x[i].childNodes[0].nodeValue + "<br>"; }
    document.getElementById("demo").innerHTML = txt; } }
  xhttp.open("GET", "cd_catalog.xml", true);
  xhttp.send(); }
</script>
</body>
</html>
```

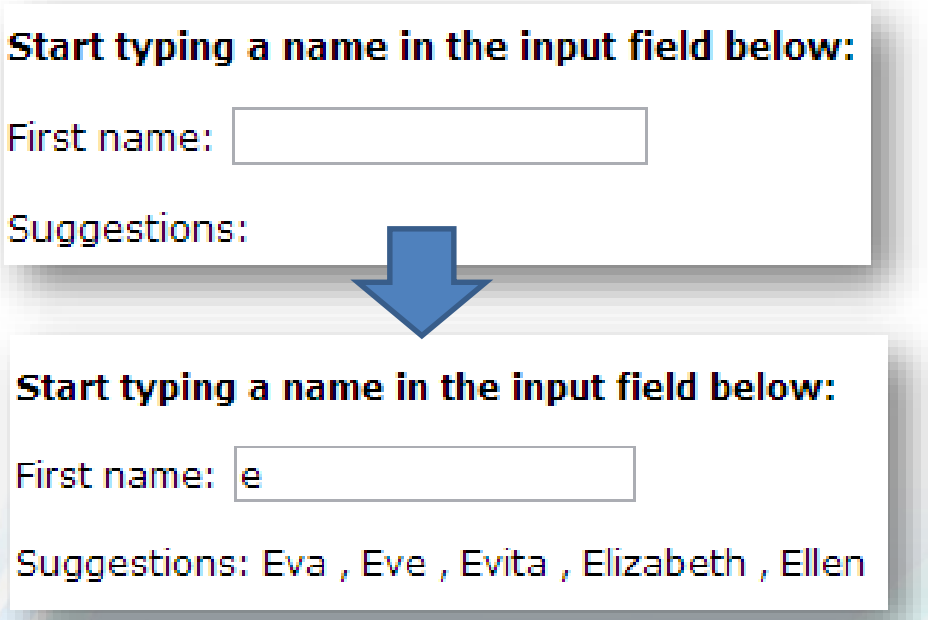
The XMLHttpRequest Object

Change Content

Cd_catalog.xml

Bob Dylan
Bonnie Tyler
Dolly Parton
Gary Moore
Eros Ramazzotti
Bee Gees
Dr.Hook
Rod Stewart
Andrea Bocelli
Percy Sledge
Savage Rose
Many
Kenny Rogers
Will Smith

Ajax: Form Suggestion: Form



1

```
1.<p><b>Start typing a name in the input field below:</b></p>
2.<form>
3.First name: <input type="text" onkeyup="showHint(this.value)" size="20" />
4.</form>
5.<p>Suggestions: <span id="txtHint"></span></p>
```

Ajax: Form Suggestion: JavaScript

2

```
1. <script>
2. function showHint(str) {
3. if (str.length==0)  {
4.   document.getElementById("txtHint").innerHTML="";
5.   return;
6. }
7.
8.   if (window.XMLHttpRequest)  {// code for IE7+,Firefox,Chrome,Opera,Safari
9.     xmlhttp = new XMLHttpRequest();
10.   }
11.  else  {// code for IE6, IE5
12.    xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
13.  }
14.
15.  xmlhttp.onreadystatechange=function() {
16.  if (xmlhttp.readyState==4 && xmlhttp.status==200) {
17.    document.getElementById("txtHint").innerHTML=xmlhttp.responseText;
18.    }
19.  }
20.
21.xmlhttp.open("GET","gethint.php?q="+str,true);
22.xmlhttp.send();
23.}
24.</script>
```

Ajax: Form Suggestion: PHP

3

```
1.<?php
2.// Fill up array with names
3.$a[]="Anna";
4.$a[]="Brittany";
5.$a[]="Cinderella";
6....
7.$a[]="Elizabeth";
8.$a[]="Ellen";
9.$a[]="Wenche";
10.$a[]="Vicky";
11.
12.$q=$_GET["q"];
13.
14.if (strlen($q) > 0)  {
15.  $hint="";
16.  for($i=0; $i<count($a); $i++) {
17.    if (strtolower($q)==strtolower(substr($a[$i],0,strlen($q))))  {
18.      if ($hint=="")
19.        $hint=$a[$i];
20.      else
21.        $hint=$hint." , ".$a[$i];
22.      }
23.    }
24.  }
25. // Set output to "no suggestion"
26. // if no hint were found
27.// or to the correct values
28.if ($hint == "")
29.  $response="no suggestion";
30.else
31.  $response=$hint;
32.
33.//output the response
34.echo $response;
35.?>
```

Ajax: Form Suggestion

2

```
<html>
<head>
<script>
function showHint(str)
{
if (str.length==0)
  {
  document.getElementById("txtHint").innerHTML="";
  return;
  }
if (window.XMLHttpRequest)
  {// code for IE7+, Firefox, Chrome, Opera, Safari
  xmlhttp=new XMLHttpRequest();
  }
else
  {// code for IE6, IE5
  xmlhttp=new ActiveXObject("Microsoft.XMLHTTP");
  }
xmlhttp.onreadystatechange=function()
  {
  if (xmlhttp.readyState==4 && xmlhttp.status==200)
    {
    document.getElementById("txtHint").innerHTML=xmlhttp.responseText;
    }
  }
xmlhttp.open("GET","gethint.php?q="+str,true);
xmlhttp.send();
}
</script>
</head>
<body>
```

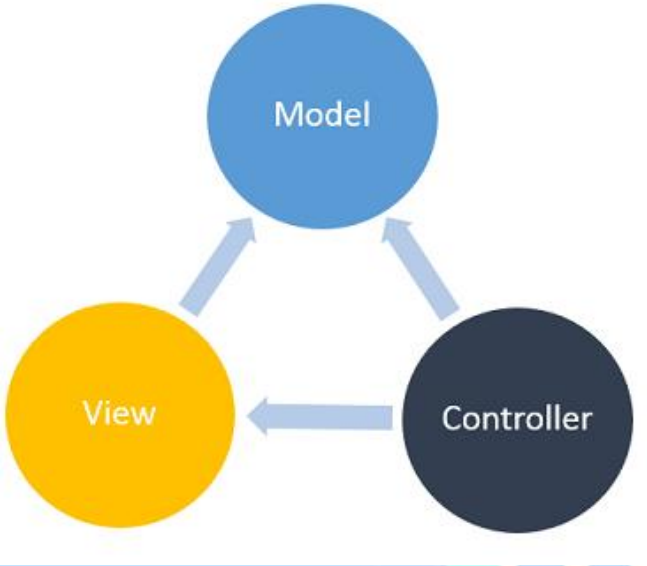
1

```
<p><b>Start typing a name in the input field below:</b></p>
<form>
First name: <input type="text" onkeyup="showHint(this.value)" size="20" />
</form>
<p>Suggestions: <span id="txtHint"></span></p>

</body>
</html>
```

3

```
<?php
// Fill up array with names
$a[]="Anna";
$a[]="Brittany";
...

//get the q parameter from URL
$q=$_GET["q"];

//lookup all hints from array if length of q>0
if (strlen($q) > 0) {
  $hint="";
  for($i=0; $i<count($a); $i++){
    if (strtolower($q)==strtolower(substr($a[$i],0,strlen($q)))){
      if ($hint=""){
        $hint=$a[$i];
        }
      else{
        $hint=$hint." , ".$a[$i];
        }
      }
    }
  }

if ($hint == "")
  $response="no suggestion";
else
  $response=$hint;

//output the response
echo $response;
?>
```

MVC in Web Programming



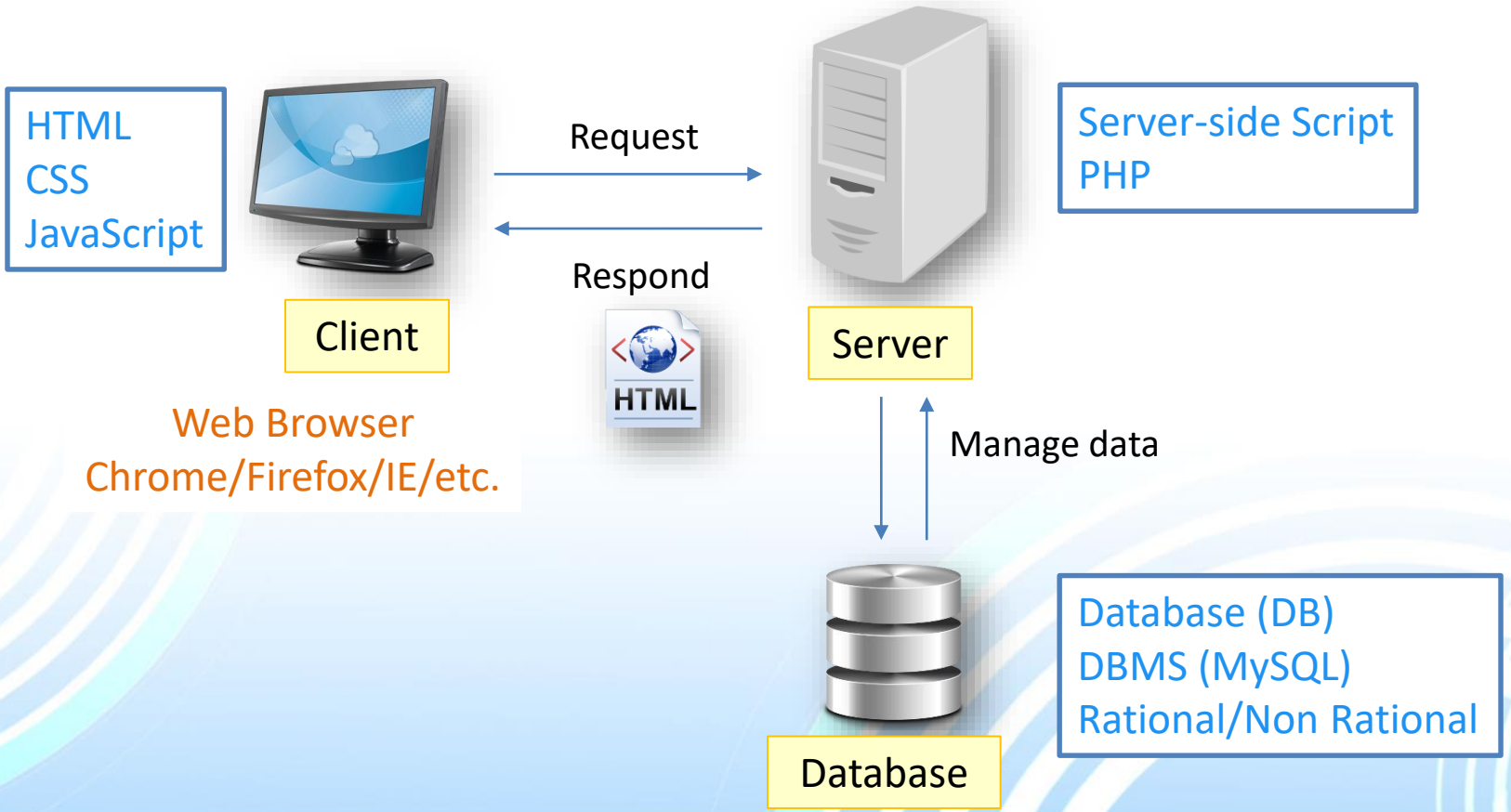
MVC (Model-View-Controller)

- A software architectural, or design pattern, for implementing user interfaces.
- Although originally developed for desktop computing, model–view–controller has been widely adopted as an architecture for World Wide Web applications in major programming languages such as PHP, ASP.NET, etc.
- adapted MVC to different contexts.
  - hierarchical model–view–controller (HMVC),
  - model–view–adapter (MVA),
  - model–view–presenter (MVP),
  - model–view–viewmodel (MVVM)

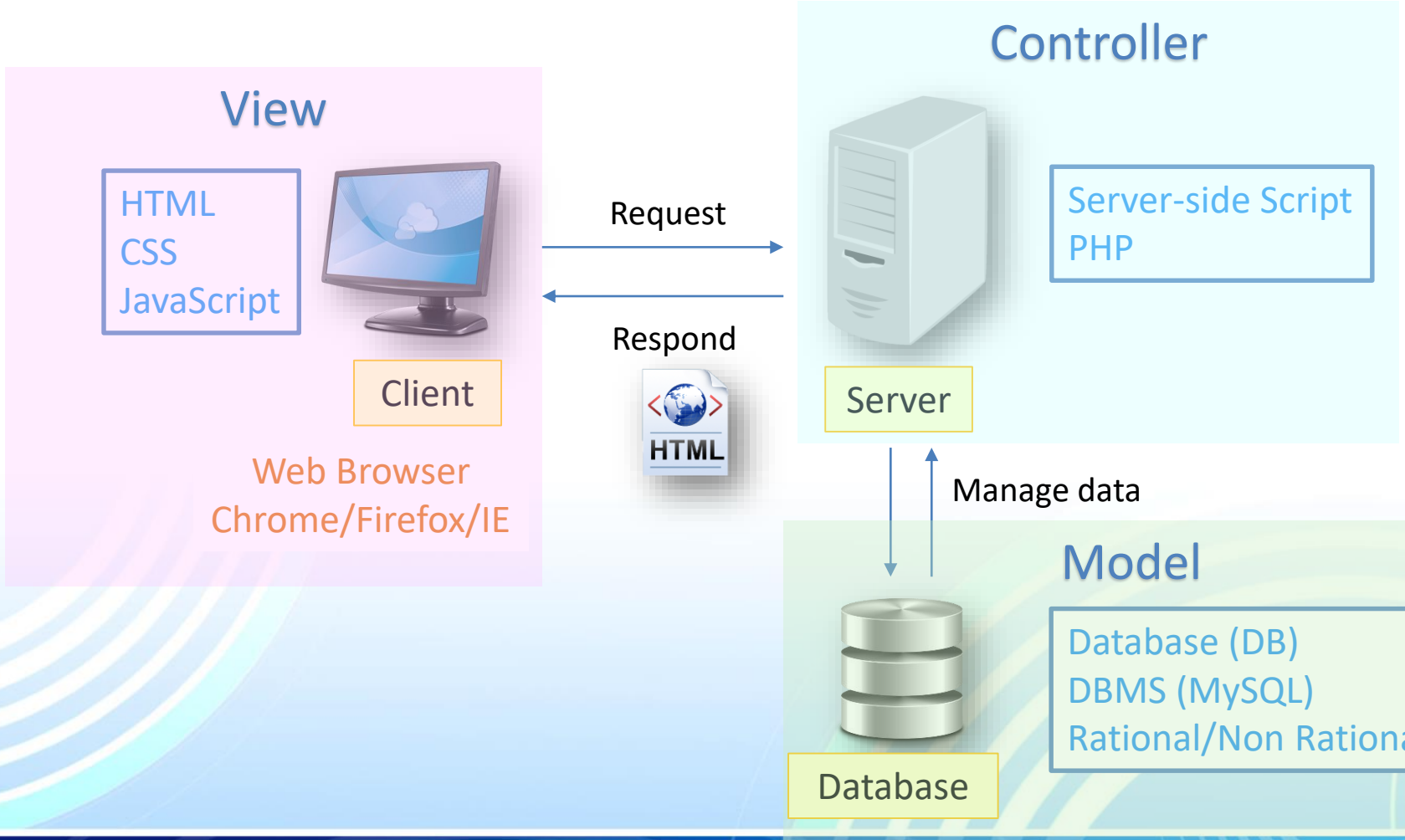
MVC (Model-View-Controller)

- It divides a web application into three interconnected parts, Model-View-Controller, which make it powerful, scalable, clean, and robust.
- Dividing the component based on responsibility.
- Efficient code reuse and parallel development

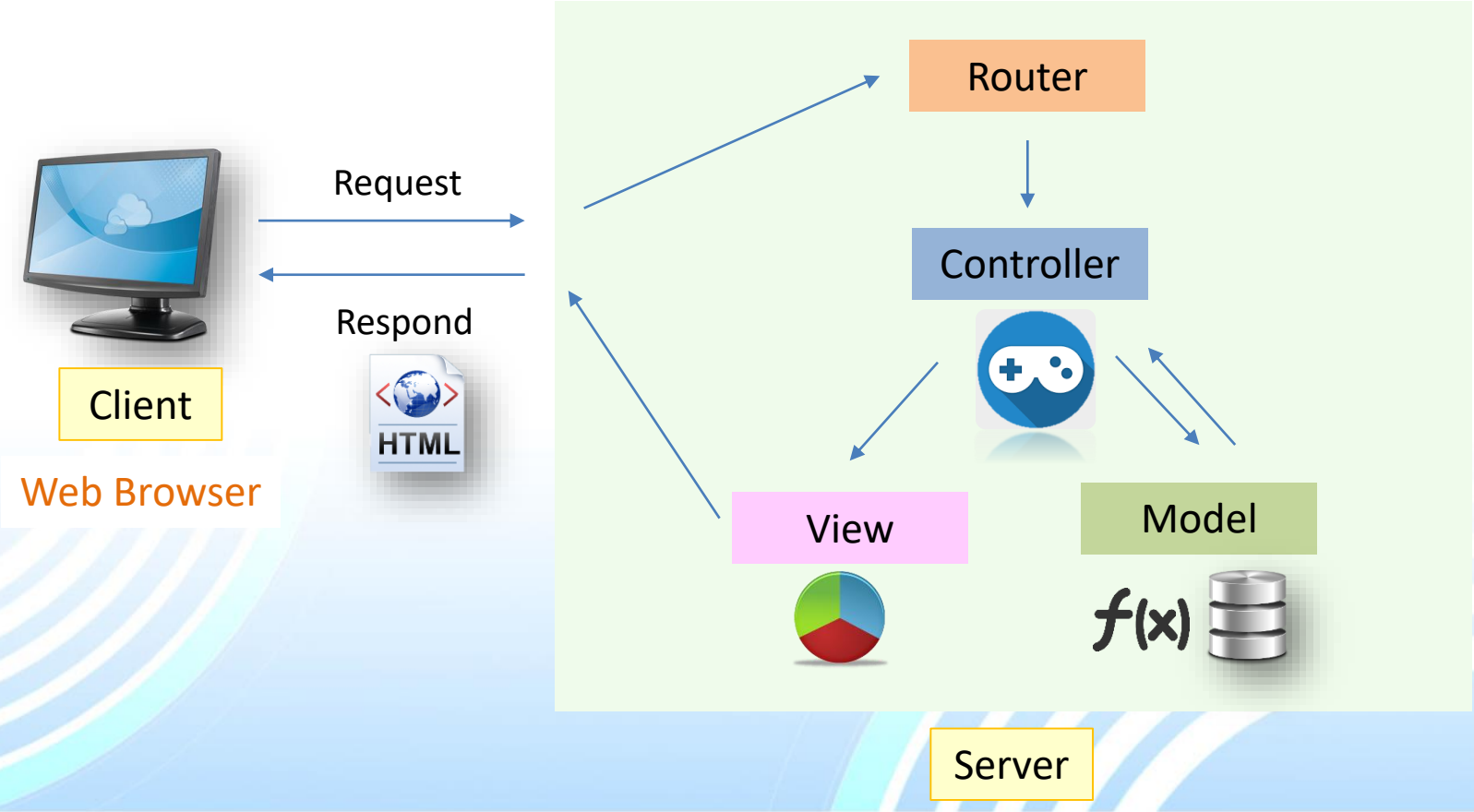
The flow based on responsibility



The flow based on responsibility

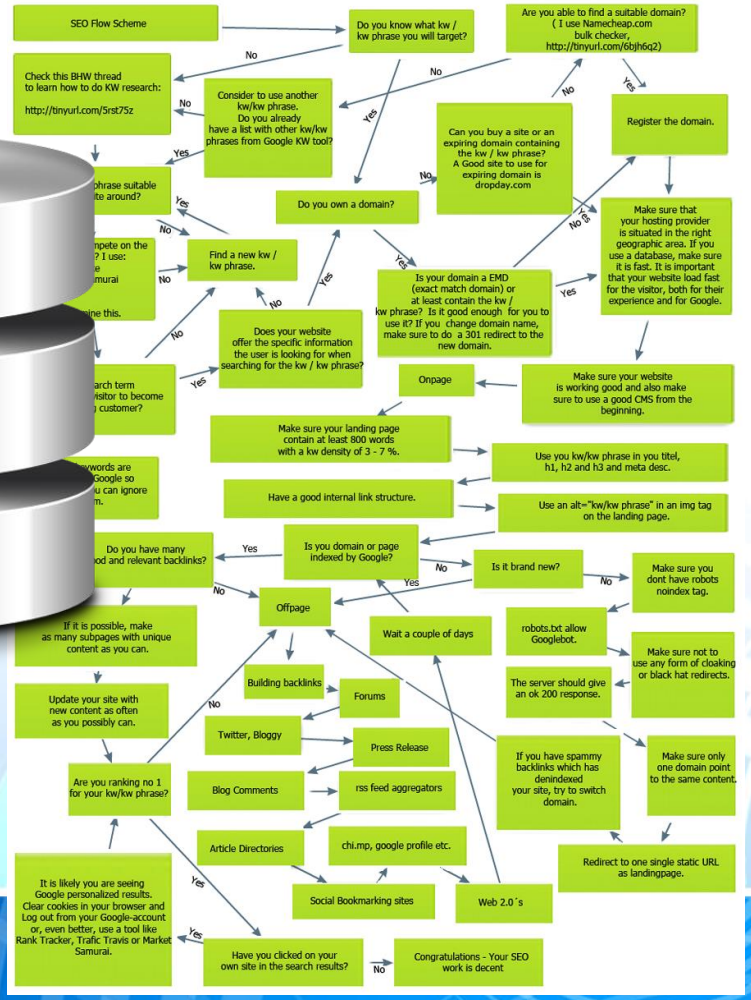


MVC Architecture



MVC: Model

- Application data
- Business rules
- Logic
- Functions



MVC: Model

- Directly manages the data, logic and rules of the application
- Adding and retrieving data from database
- Processing data from or to database
- Speaking only with the Controller (not to the view directly)
- Independent of user interface

MVC: View

- Representation of data
  - Chart or diagram
  - Table
  - Article

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam eget leo in urna tincidunt eleifend. Ut aliquet eleifend neque, a commodo leo viverra vel. Curabitur justo erat, rutrum in ornare laoreet, venenatis nec ipsum. Sed nisi nisl, scelerisque vitae dapibus a, sagittis sit amet nunc. Integer vitae gravida tellus. Aenean dapibus non velit id elementum. Donec venenatis sed orci ac tristique.

MVC: View

- Output presentation, e.g., Charts/ Diagrams/ Content
- Provide multiple view of the same information
- Using HTML and CSS
- The only thing that user ever sees
- Only listen to the Controller

MVC: Controller

- Receives input
- Connects between models and views (Middle man)

MVC: Controller

- Responsible for handling HTTP request
- Apply server side logic and process GET/POST requests
- Take information from user
- Talk to model to get data
- Tell view how to display

“We need SMART Models,
THIN Controllers,
and DUMB Views”

Unknown

Example of the flow in MVC

- A user interacts with the view - by clicking on a link or submitting a form.
- The Controller handles the user input, and transfers the information to the model
- The Model receives the information and updates it's state (adds data to a database, for example, or calculates todays date)
- The View checks the state of the Model and responds accordingly (listing the newly entered data, maybe)
- The View waits for another interaction from the user.

Framework: Implementing MVC

- A very good implementation of MVC is the DRY (Don't Repeat Yourself) philosophy.
- Universal & Reusable software platform to develop applications
- Include support programs, compilers, code libraries, tools, or APIs

More abstractions, libraries, frameworks on top of HTTP

Request

GET, POST

Web Forms
MVC
Web API

Response

HTML, JSON, File, XML

Examples of implementing frameworks

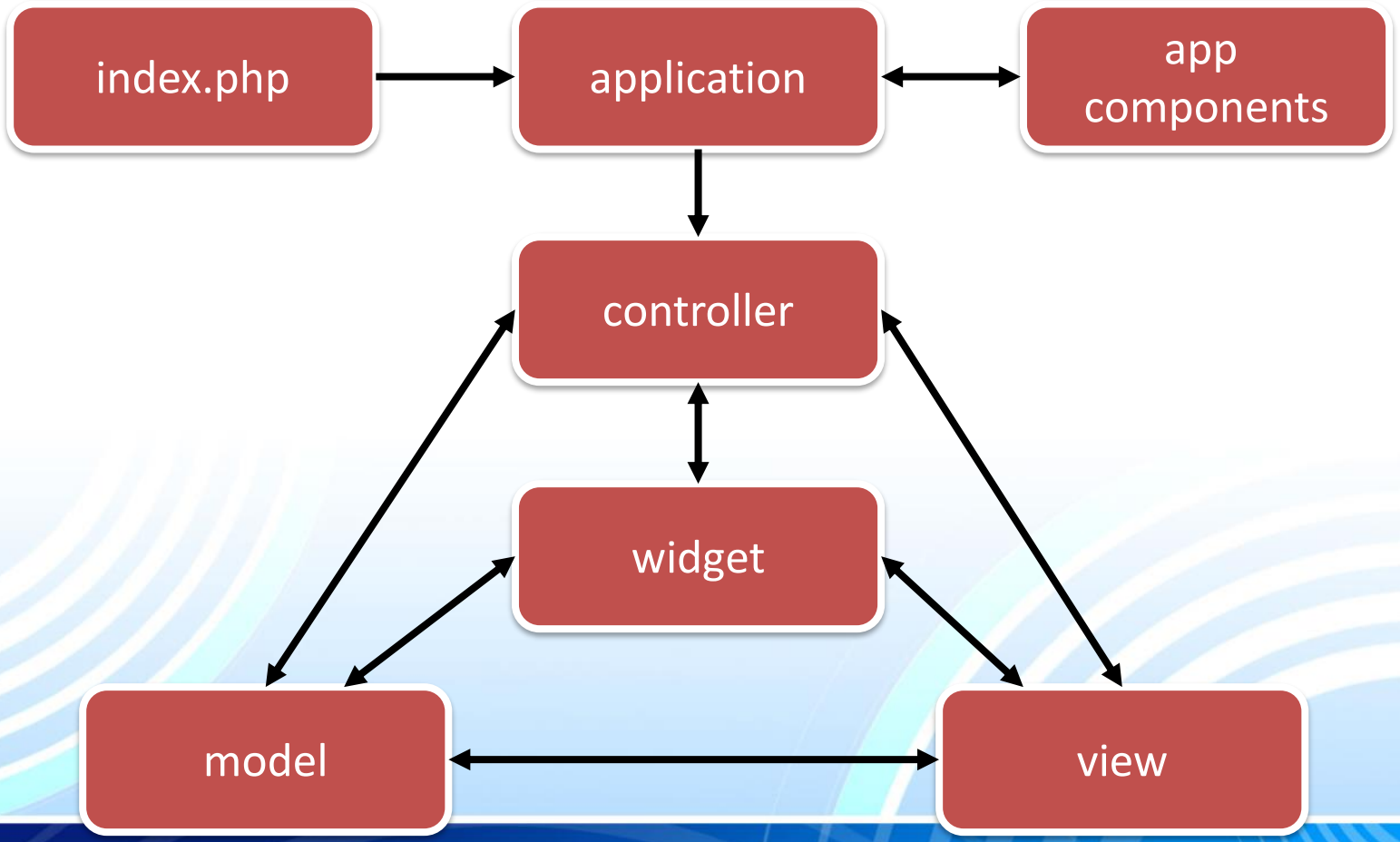
- Yii

- ASP.NET

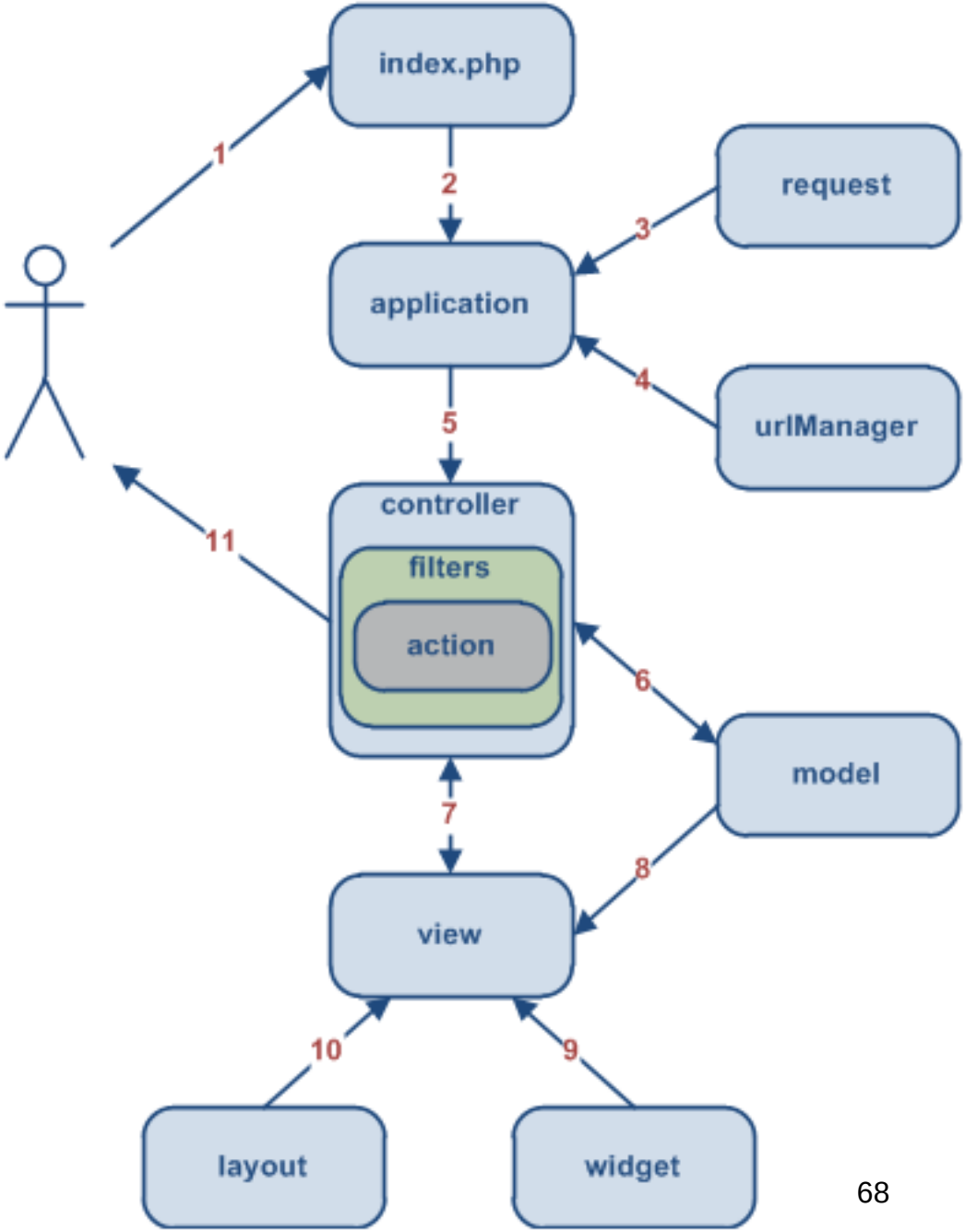
Yii Framework

- Yii is a high-performance, component-based PHP framework for developing large-scale Web applications rapidly.
- It enables maximum reusability in Web programming and can significantly accelerate your Web application development process.
- The name **Yii** (pronounced Yee or [ji:]) is an acroynym for "Yes It Is!".

Yii Structure



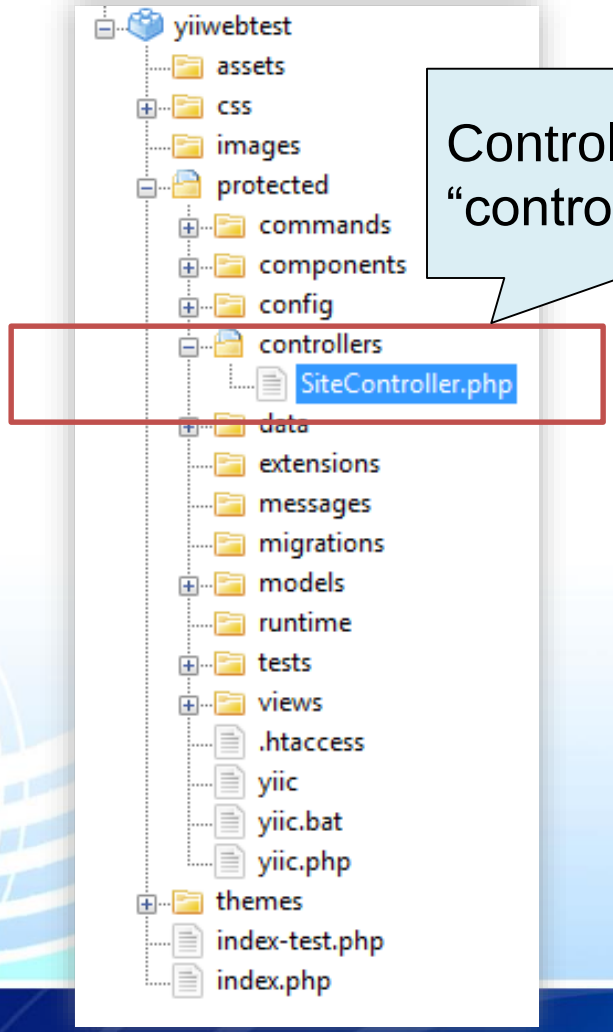
Typical Workflow



Yii Structure: protected

```
controllers/            containing controller class files
   SiteController.php   the default controller class
data/                   containing the sample database
   schema.mysql.sql     the DB schema for the sample MySQL database
   schema.sqlite.sql    the DB schema for the sample SQLite database
   testdrive.db         the sample SQLite database file
extensions/             containing third-party extensions
messages/               containing translated messages
models/                 containing model class files
   LoginForm.php        the form model for 'login' action
   ContactForm.php      the form model for 'contact' action
runtime/                containing temporarily generated files
tests/                  containing test scripts
views/                  containing controller view and layout files
   layouts/             containing layout view files
      main.php          the base layout shared by all pages
      column1.php       the layout for pages using a single column
      column2.php       the layout for pages using two columns
   site/                containing view files for the 'site' controller
      pages/            containing "static" pages
         about.php      the view for the "about" page
      contact.php       the view for 'contact' action
      error.php         the view for 'error' action (displaying external errors)
      index.php         the view for 'index' action
      login.php         the view for 'login' action
```

Controller



Controller under "controllers" folder

Controller ID

```
class SiteController extends CController
{
    public function actionIndex()
    {
        // ...
    }

    public function actionContact()
    {
        // ...
    }
}
```

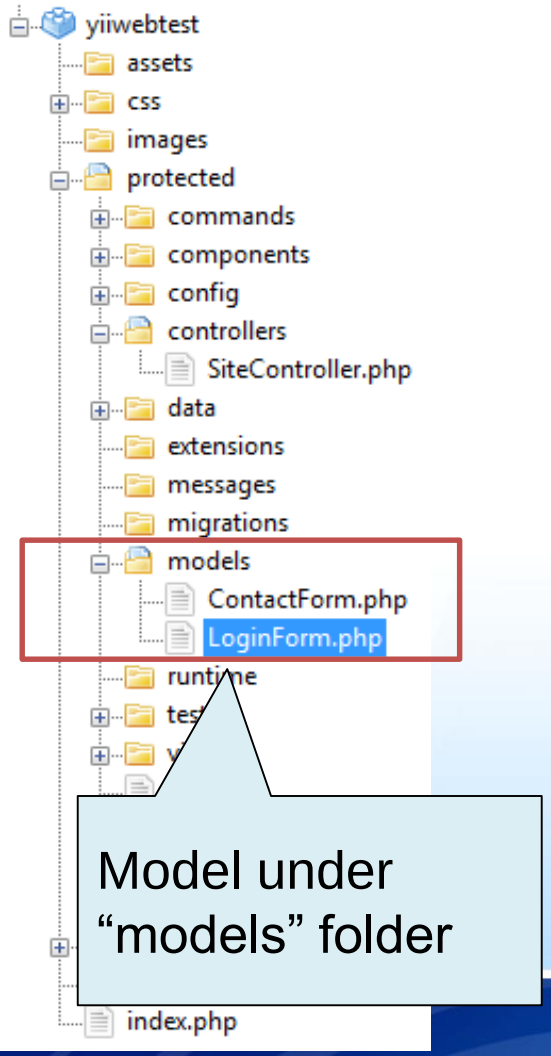
Action ID

Controller

```php
class SiteController extends CController
{
    public function actionIndex()
    {
        // ...
    }

    public function actionContact()
    {
        // ...
    }
}
```

- When a controller runs, it performs the requested action, which usually brings in the needed models and renders an appropriate view.
- When the user request does not specify which action to execute, the default action, index, will be executed.

Model



Model under "models" folder

```
class LoginForm extends CFormModel
{
    public $username;
    public $password;
    public $rememberMe=false;

    private $_identity;

    public function rules()
    {
        return array(
            array('username, password', 'required'),
            array('rememberMe', 'boolean'),
            array('password', 'authenticate'),
        );
    }

    public function authenticate($attribute,$params)
    {
        $this->_identity=new UserIdentity($this->username,$this->password);
        if(!$this->_identity->authenticate())
            $this->addError('password','Incorrect username or password.');
    }
}
```

Model attributes

Validation Rules

Method in model

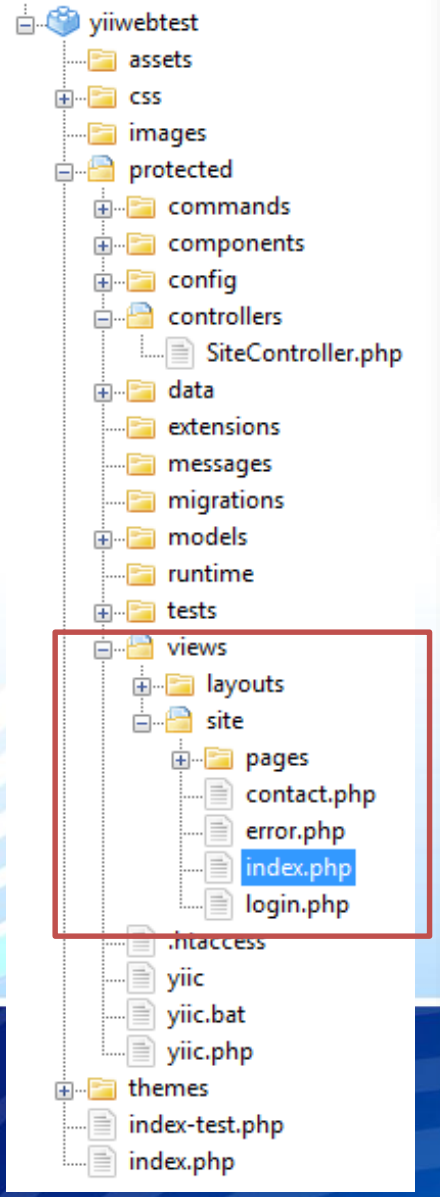
Model rules validation

```php
public function rules()
{
    return array(
        array('username, password', 'required'),
        array('password_repeat', 'required', 'on'=>'register'),
        array('password', 'compare', 'compareAttribute'=>'password_repeat', 'on'=>'register'),
    );
}
```

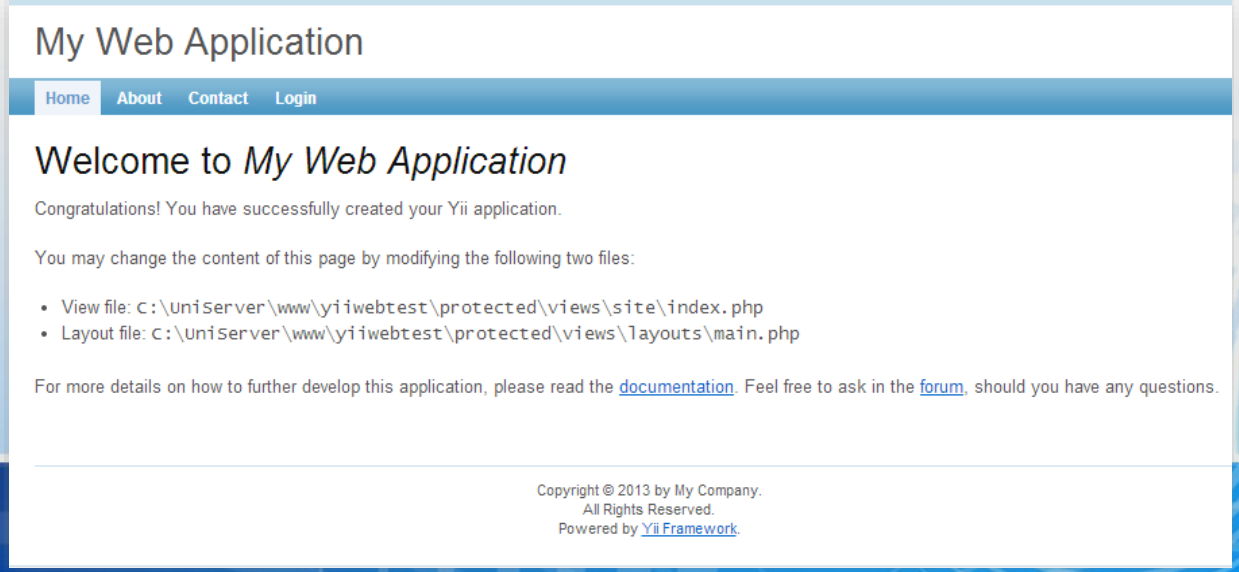
```php
array(
    // mandatory arguments
    'attribute list',
    'validator name',
    // optional parameters
    'on'=>'scenario name',
    'message'=>'The attribute didn\'t validate!',
    ...validation parameters...
);
```

- *attribute list*: specifies the attributes (separated by commas) to be validated;
- *validator name*: specifies the validator to be used. See the next section for details.
- *on*: this specifies the scenarios when the validation rule should be performed. Separate different scenarios with commas. If this option is not set, the rule will be applied in any scenario. See the section [Scenarios] [#Scenarios] for details.
- *message*: replaces the default error message if validation fails.
- *...validation parameters...*: any number of extra parameters to be used by the specified validator.

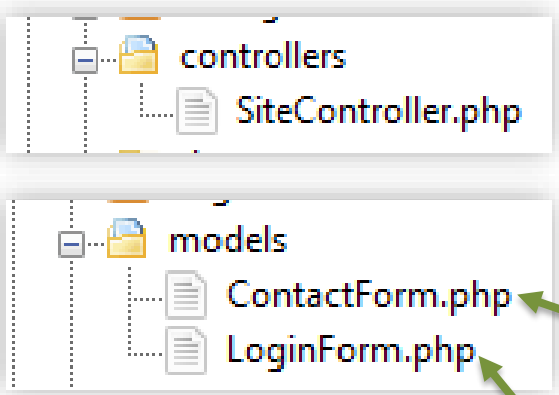
View




```php
<?php
/* @var $this SiteController */

$this->pageTitle=Yii::app()->name;
?>

<h1>Welcome to <i><?php echo CHtml::encode(Yii::app()->name); ?></i></h1>

<p>Congratulations! You have successfully created your Yii application.</p>

<p>You may change the content of this page by modifying the following two files:</p>
<ul>
    <li>View file: <code><?php echo __FILE__; ?></code></li>
    <li>Layout file: <code><?php echo $this->getLayoutFile('main'); ?></code></li>
</ul>

<p>For more details on how to further develop this application, please read
the <a href="http://www.yiiframework.com/doc/">documentation</a>.
Feel free to ask in the <a href="http://www.yiiframework.com/forum/">forum</a>,
should you have any questions.</p>
```

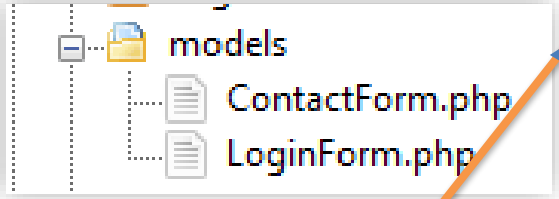


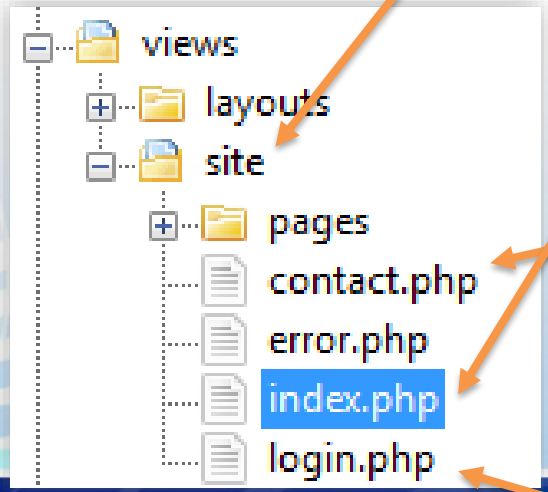
MVC Relation in Yii




```php
<?php

class SiteController extends Controller
{
    /** Declares class-based actions. ...*/
    public function actions(){...}

    /** This is the default 'index' action that is invoked ...*/
    public function actionIndex()
    {
        // renders the view file 'protected/views/site/index.php'
        // using the default layout 'protected/views/layouts/main.php'
        $this->render('index');
    }

    /** Displays the contact page ...*/
    public function actionContact()
    {
        $model=new ContactForm;
        if(isset($_POST['ContactForm']))
        {
            $model->attributes=$_POST['ContactForm'];
            if($model->validate()){...}
        }
        $this->render('contact',array('model'=>$model));
    }

    /** Displays the login page ...*/
    public function actionLogin()
    {
        $model=new LoginForm;
        // if it is ajax validation request
        if(isset($_POST['ajax']) && $_POST['ajax']==='login-form'){...}
        // collect user input data
        if(isset($_POST['LoginForm'])){...}
        // display the login form
        $this->render('login',array('model'=>$model));
    }
```

MVC Relation in Yii






```php
<?php

class SiteController extends Controller
{
    /** Declares class-based actions. ...*/
    public function actions(){...}

    /** This is the default 'index' action that is invoked ...*/
    public function actionIndex()
    {
        // renders the view file 'protected/views/site/index.php'
        // using the default layout 'protected/views/layouts/main.php'
        $this->render('index');
    }

    /** Displays the contact page ...*/
    public function actionContact()
    {
        $model=new ContactForm;
        if(isset($_POST['ContactForm']))
        {
            $model->attributes=$_POST['ContactForm'];
            if($model->validate()){...}
        }
        $this->render('contact',array('model'=>$model));
    }

    /** Displays the login page ...*/
    public function actionLogin()
    {
        $model=new LoginForm;
        // if it is ajax validation request
        if(isset($_POST['ajax']) && $_POST['ajax']==='login-form'){...}
        // collect user input data
        if(isset($_POST['LoginForm'])){...}
        // display the login form
        $this->render('login',array('model'=>$model));
    }
```

Contact Page

My Web Application

Home About Contact Login

Home » Contact

Contact Us

If you have business inquiries or other questions, please fill out the following form to contact us. Thank you.

*Fields with * are required.*

Name *

Email *

Subject *

Body *

Verification Code

saghyam

Get a new code

Please enter the letters as they are shown in the image above.
Letters are not case-sensitive.

Submit

URL

http://localhost/yiiwebtest/index.php?r=site/contact

Controller ID

Action ID

Redirect

```
$this->redirect(array(‘controllerID/actionID',
            ‘var1‘ => $value1,
            ‘var2‘ => $value1));
```

For Example

```
$this->redirect(array('changeEmailResult','scb'=>$successBool,
                'email'=>$studentModel->m_email));
```

ASP.NET

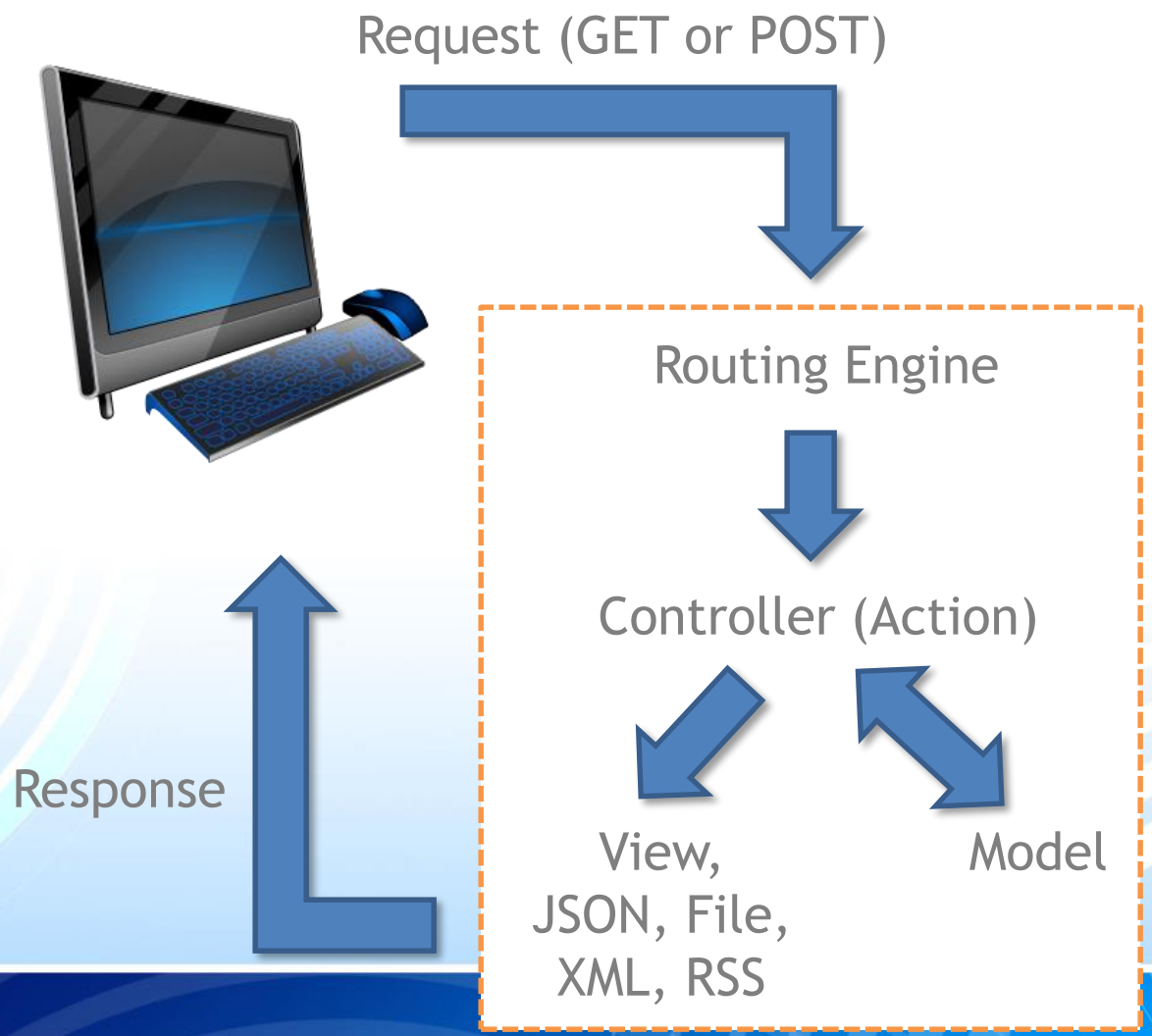
- ASP.NET is an open-source server-side web application framework designed for web development to produce dynamic web pages. It was developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services.

- ASP.NET offers three frameworks for creating web applications: ASP.NET Web Forms, ASP.NET MVC, and ASP.NET Web Pages.

ASP.NET MVC

- ASP.NET MVC can make it easier to manage complexity in larger applications.
- Multiple teams can work on a web site because the code for the business logic is separate from the code and markup for the presentation layer.
- Developers can work on the business logic while designers work on the markup and JavaScript that is sent to the browser.

ASP.NET MVC



ASP.NET MVC

Style Sheets, Images

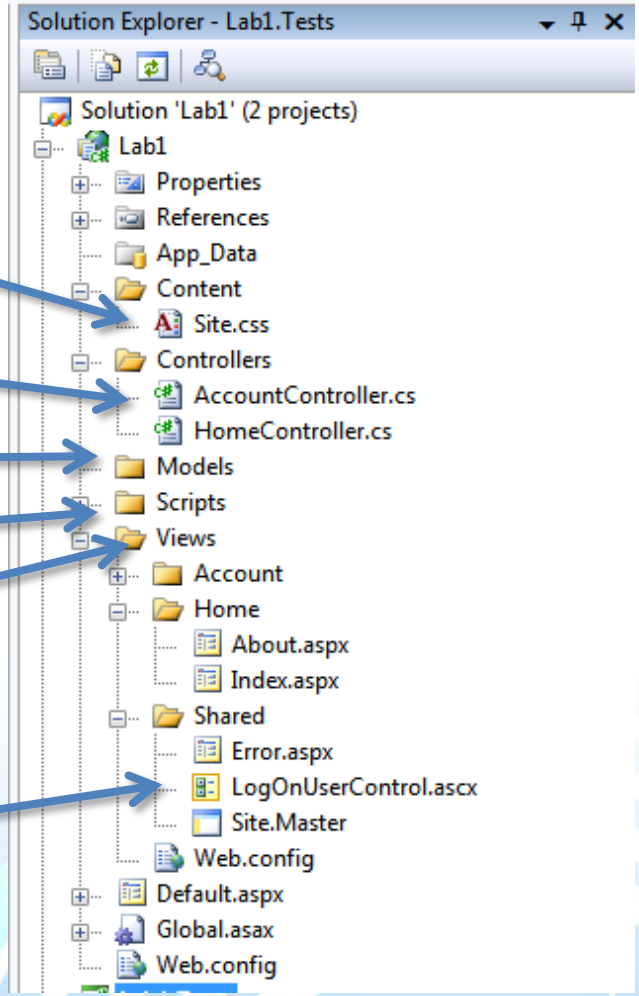
Controllers

Models

JavaScript

Views

Master Pages



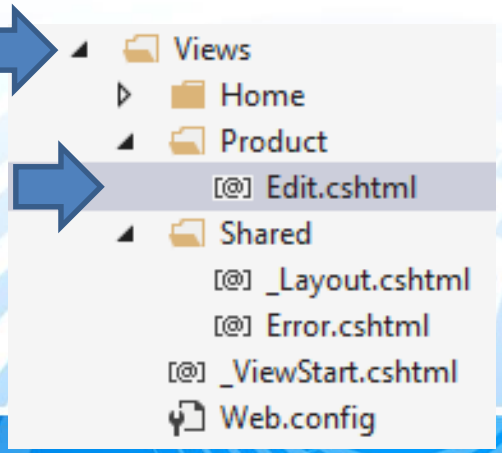
ASP.NET MVC - Routing

Controller Action

http://server/product/edit

Folder View

```
public class ProductController : Controller
{
    public ActionResult Edit()
    {
        return View();
    }
}
```



MVC Advantages

- *Simultaneous development* – Multiple developers can work simultaneously on the model, controller and views.
- ***High cohesion*** – MVC enables logical grouping of related actions on a controller together. The views for a specific model are also grouped together.
- ***Low coupling*** – The very nature of the MVC framework is such that there is low coupling among models, views or controllers
- *Ease of modification* – Because of the separation of responsibilities, future development or modification is easier
- *Multiple views for a model* – Models can have multiple views

MVC Disadvantages

- *Code navigability* – The framework navigation can be complex because it introduces new layers of abstraction and requires users to adapt to the decomposition criteria of MVC.
- *Multi-artifact consistency* – Decomposing a feature into three artifacts causes scattering. Thus, requiring developers to maintain the consistency of multiple representations at once.
- *Pronounced learning curve* – Knowledge on multiple technologies becomes the norm. Developers using MVC need to be skilled in multiple technologies.

References

- W3Schools: http://www.w3schools.com
- What is Ajax?: http://webdesign.about.com/od/ajax/a/aa101705.htm
- What is Ajax?: http://www.tutorialspoint.com/ajax/what_is_ajax.htm
- PHP Freaks: http://www.phpfreaks.com
- Why Use Model View Controller http://www.htmlgoodies.com/beyond/php/article.php/3912211
- https://r.je/mvc-tutorial-real-application-example.html
- Yii Framework: http://www.yiiframework.com/doc/guide/1.0/en/quickstart.what-is-yii
- Microsoft site for MVC: https://msdn.microsoft.com/en-us/library/4w3ex9c2.aspx

Activity 1

1. Develop a PHP program by using the provided classes (input.php and output.php). Create HTML as the example below:

Parents:	John,35;Jane,30
Children:	Tim,12;Tom,10;Tam,13
	Process

Parent

Total member is 5

Name: John	Name: Jane
Age: 35	Age: 30
	

Children

Name: Tim	Name: Tom	Name: Tam
Age: 12	Age: 10	Age: 13
		

Extra: Apply AJAX in order to display the result on the browser