



INTRODUCTION TO WEB PROGRAMMING

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Intro
A



SPRING 2014 CLASS



jemabarr



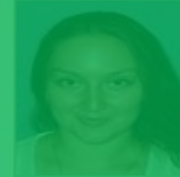
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CONTENTS

- About this course
- Prerequisites
- The underlying technologies
- Client-side programming
- Server-side programming
- Expectations of this online class
- How can I be successful in this course?
- Important Resources

ABOUT THIS COURSE

- The syllabus
- What is the difference between **web programming** and **application programming**?
- What is the difference between **web programming** and **web design**?
- What is the difference between a **face-to-face** vs. an **online** class?

PREREQUISITES

- One or more programming class e.g., CSCI-C101 / INFO-I210 (C++) or CSCI-A201 (Visual Basic).
 - Understanding of variables, operators, conditionals, loops, functions, parameters passing, compiling and debugging code.
- Completing the IU-READY assessment instrument.
www.ready.iusb.edu
 - Having access to proper hardware, software and networking equipment.
 - Knowing how to use the facilities in OnCourse.
 - Knowing how to be a student!
- **Meaningful participation** (keeping up with the reading, watching the video lectures, completing the quizzes, using the OnCourse chat, attending Q/A sessions during virtual office, completing the labs and homework on time, asking and/or answering meaningful questions)



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**Intro
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UNDERLYING TECHNOLOGIES

- The web, what is it and how does it work?
- What is HTTP?
- What is HTML?
- What is CSS?
- What is a client-side programming? What is Java script?
- What is a server-side programming? What is PHP ?
- What is the difference between a **static** and a **dynamic** web pages?

THE WEB!

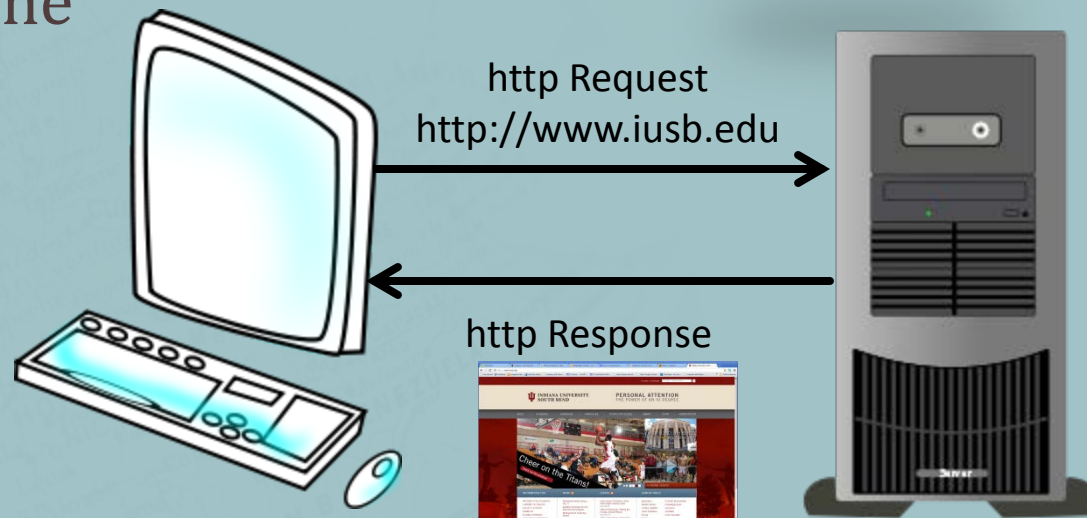
WHAT IS IT? HOW DOES IT WORK?

- Network
 - Internet
 - Network protocols
 - IP address
 - IP Packets
- Learn about these terms by viewing the following two videos:
 1. [Http://www.youtube.com/watch?v=i5oe63p0hLI](http://www.youtube.com/watch?v=i5oe63p0hLI)
 2. http://www.youtube.com/watch?v=Ve7_4ot-Dzs

WHAT IS HTTP



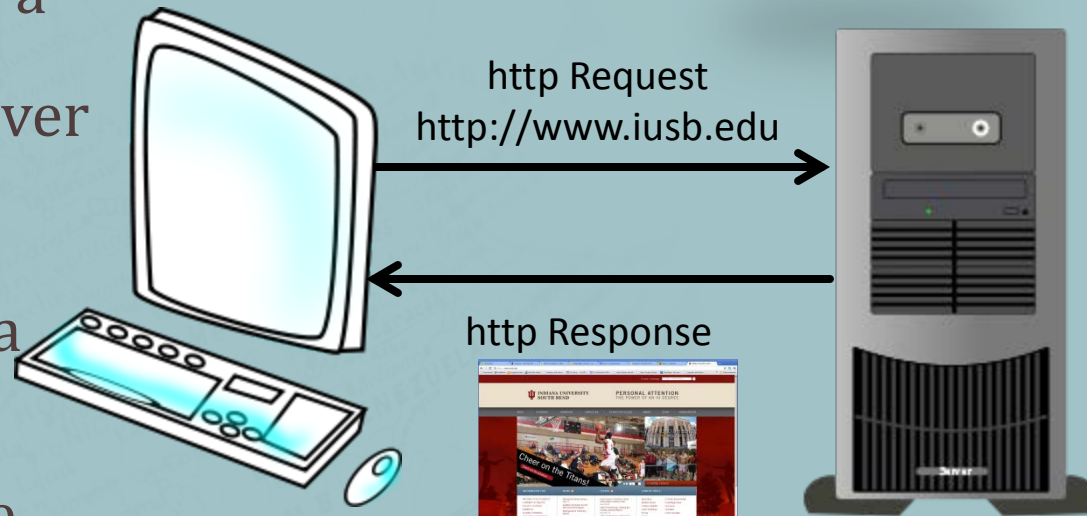
- HTTP or Hyper Text Transfer Protocol is one of the transfer (data communication) protocols used in the WWW.
- HTTP session is a sequence of request-response transactions between a browser and a web server.



WHAT IS HTTP



- An HTTP client initiates a request by establishing a (TCP) connection to a particular port on a server (usually 80)
- The server sends back a status line, such as "HTTP/....OK", and a message of its own. The body of this message is typically the requested resource (such as a web page.)



http://en.wikipedia.org/wiki/Hypertext_Transfer_Protocol

HTTP REQUEST METHODS

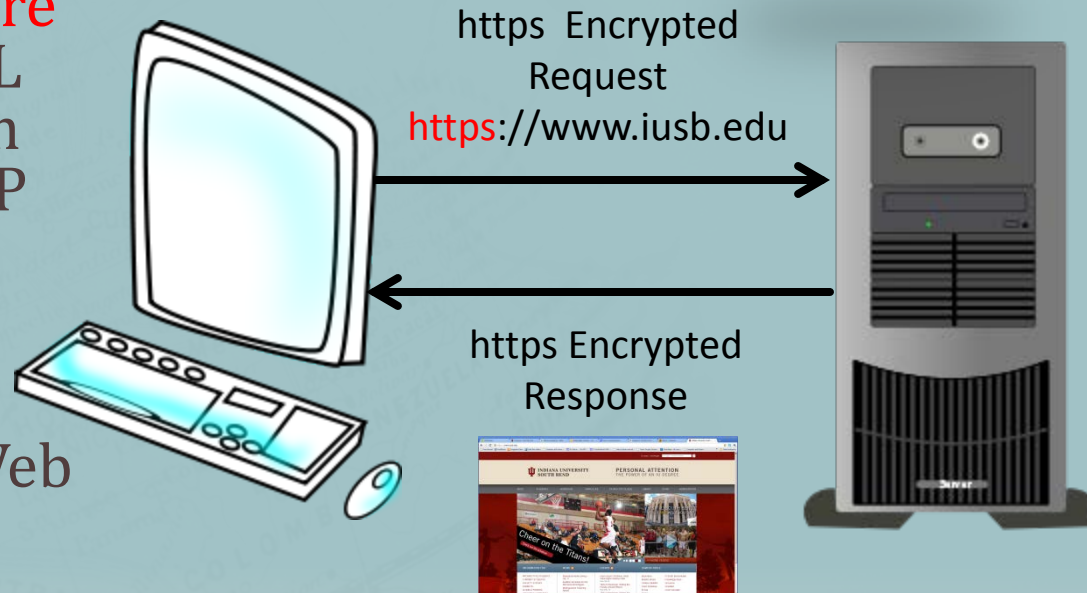
- **GET** - Requests a representation of the specified resource. Requests using GET should only retrieve data and should have no other effect.
- **HEAD** - Similar to GET request, but without the response body. This is useful for retrieving meta-information written in response headers, without having to transport the entire content.
- **POST** - Requests that the server accept the entity enclosed in the request as a new subordinate of the resource identified by the URI. The data POSTed might be some data that is the result of submitting a web form.
- **PUT** - Requests that the enclosed entity be stored under the supplied URI. If the URI refers to an already existing resource, it is modified; if the URI does not point to an existing resource, then the server can create the resource with that URI.
- **DELETE** - Deletes the specified resource.
- **TRACE** - Echoes back the received request so that a client can see what (if any) changes or additions have been made by intermediate servers.
- **OPTIONS** - Returns the HTTP methods that the server supports for specified URL. This can be used to check the functionality of a web server by requesting '*' instead of a specific resource.
- **CONNECT** - Converts the request connection to a transparent TCP/IP tunnel, usually to facilitate SSL-encrypted communication (HTTPS) through an unencrypted HTTP proxy.
- **PATCH** - Is used to apply partial modifications to a resource.

HTTP servers are required to implement at least the GET and HEAD methods.

WHAT IS HTTPS



- HTTPS or Hyper Text Transfer Protocol **Secure** is implemented as a SSL (secure socket layer) on top of the existing HTTP protocol.
- HTTPS provides both **authentication** of the Web Server (as certified) as well as **bi-directional encryption** between the client (web browser) and the web-server.



HTML

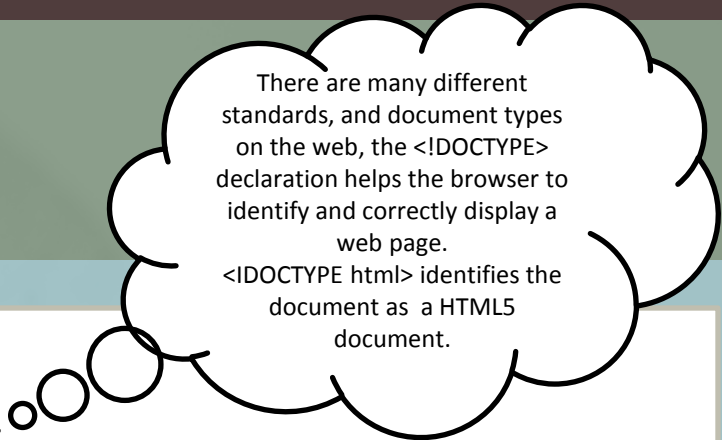
- HTML stands for **H**yper **T**ext **M**arkup **L**anguage.
- It is a language for describing creating web pages.
- HTML consists of “normal text” and markup “tags”.
- Most “tags” have a open and close tag. (but not all)
 - `<html> </html>`
 - `<body> </body>`
 - `<p> </p>`
 - `<center> </center>`

Example:

```
<!DOCTYPE html>
<html>
<body>
  <center>
    <h1>CSCI-A340 Introduction to Web Programming</h1>
    </center>

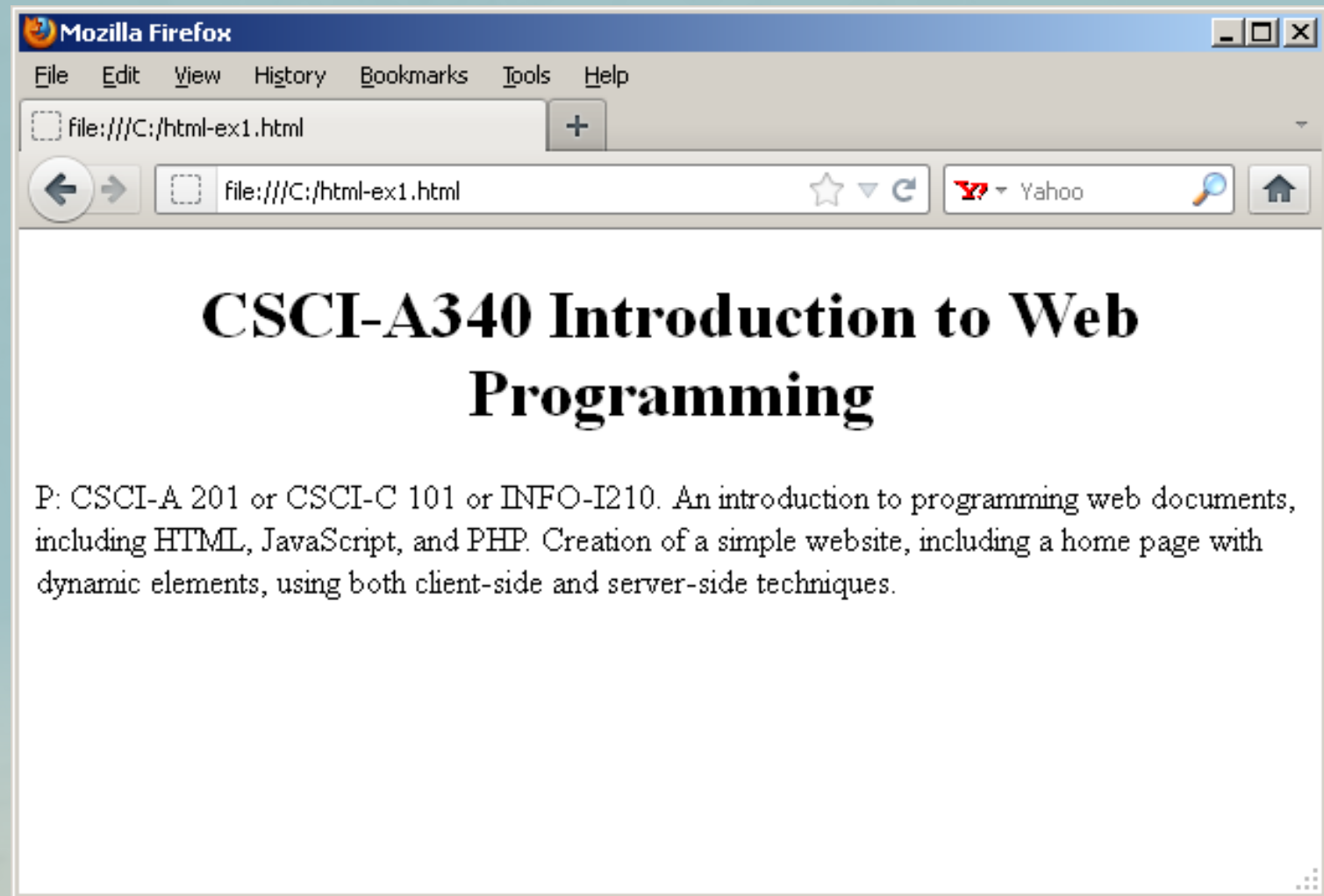
    <p>P: CSCI-A 201 or CSCI-C 101 or INFO-I210. An introduction
      to programming web documents, including HTML,
      JavaScript, and PHP. Creation of a simple website,
      including a home page with dynamic elements, using both
      client-side and server-side techniques.</p>

  </body>
</html>
```



There are many different standards, and document types on the web, the `<!DOCTYPE>` declaration helps the browser to identify and correctly display a web page. `<!DOCTYPE html>` identifies the document as a HTML5 document.

OUTPUT





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Intro
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CSS

- CSS stands for **C**ascading **S**tyle **S**heets
- CSS is used to control the “**style and layout**” of our web documents.
- In the example(right), we are creating a new “Style sheet” which can be applied to an existing HTML document.
 - We are setting the background of the body to light-blue.
 - Any header1 elements (H1) will be centered and displayed in red.
 - Any paragraph elements (P) will be displayed using “Times Roman” font.
 - All we have to do now is to include this new style in between the header tags of any html document. `<head> </head>`
- Style sheets can also be placed in external CSS files and simply included in the HTML document.

Example

```
<style>
body
{
background-color:lightblue;
}

h1
{
color:red;
text-align:center;
}

p
{
font-family:"Times New Roman";
font-size:20px;
}
</style>
```


ADDING THE STYLE SHEET TO OUR WEB PAGE

Example:

```
<!DOCTYPE html>
<html>
<head>
  .....
</head>
<body>
  <center>
    <h1>CSCI-A340 Introduction to Web Programming</h1>
  </center>

  <p>P: CSCI-A 201 or CSCI-C 101 or INFO-I210. An introduction to
    programming web documents, including HTML, JavaScript, and PHP.
    Creation of a simple website, including a home page with dynamic
    elements, using both client-side and server-side techniques.</p>

</body>
</html>
```

<style>

```
body
{
  background-color:lightblue;
}
```

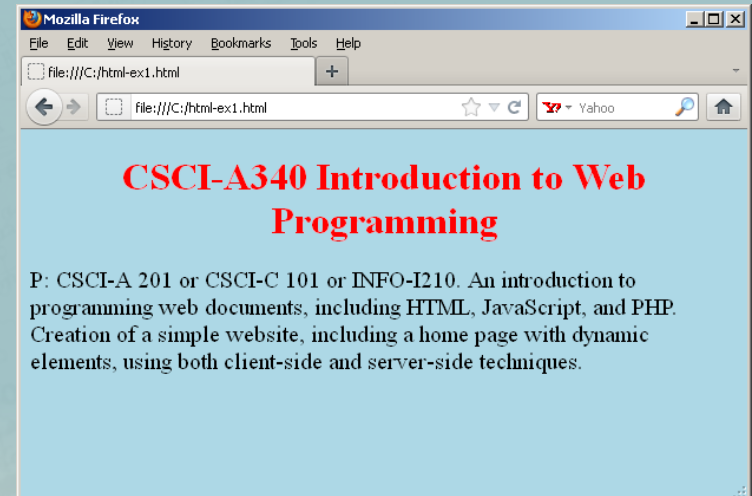
```
h1
{
  color:red;
  text-align:center;
}
```

```
p
{
  font-family:"Times New Roman";
  font-size:20px;
}
```

</style>

OUTPUT

- Without CSS
- With CSS



WHY STYLE SHEET?

- Because HTML was never intended to contain tags for formatting a document.
- HTML was intended to define the content of a document, like:
 - `<h1>This is a heading</h1>`
 - `<p>This is a paragraph.</p>`
- When tags like ``, and color attributes were added to the HTML 3.2 specification, it created a problem. Now every html element (in every html page) could potentially need a series of these tags!
- To resolve this potential problem, the World Wide Web Consortium (W3C) developed CSS.

WHAT IS JAVA SCRIPT?

- Java script is a scripting language which is typically used to **enhance the functionality and appearance** of web pages.
- Java script is the de facto standard for client side programming for web based applications.
- Java scripts are executed by the browser, however some browsers (specifically Microsoft IE) disable this capability. Therefore, if you use IE, you need to enable the execution of java script in your browser.

JAVA SCRIPT

- The java script example creates a simple function for displaying the date, and connects it to the event handler of a button.

Example:

```
<!DOCTYPE html>
<html>
<head>
<script>
function displayDate()
{
document.getElementById("placeholder").innerHTML=Date();
}
</script>
</head>
<body>

<h1>My First JavaScript</h1>
<p id="placeholder">the date will appear here...</p>

<button type="button" onclick="displayDate()">Display
Date</button>

</body>
</html>
```

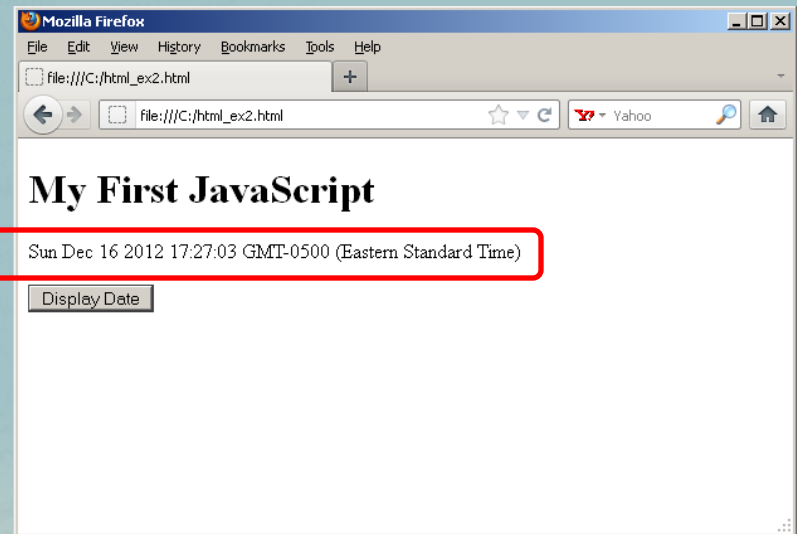
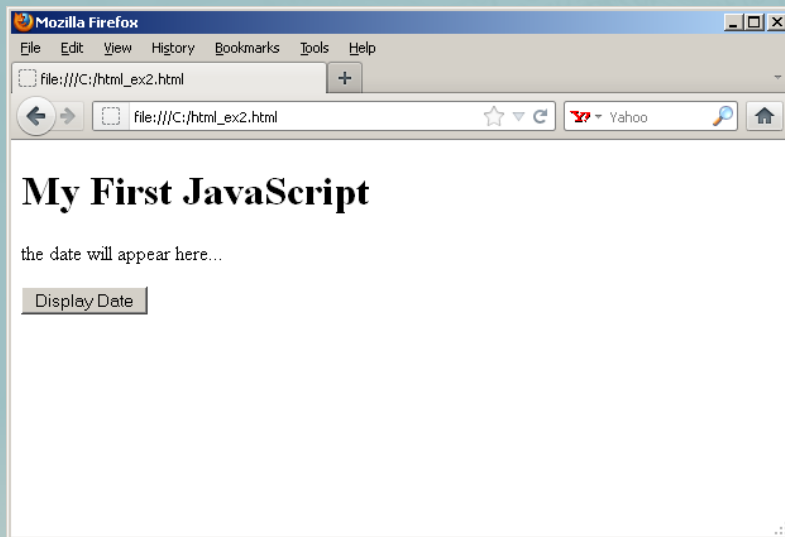
Java Script

*Called when the
button is clicked*

Event
Handler

OUTPUT

- Before Click
- After Click





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Intro
D

PHP

- PHP is acronym for Hypertext Preprocessor.
- PHP is a popular and robust server-side scripting language used for web application development.
- It is used to build web application logic.
- Syntactically, it is based on C / C++ language.
- PHP is open source.
- It can be embedded in HTML documents.
- It can also embed HTML tags and data.
- The web server needs a PHP interpreter to interpret the embedded PHP statements.

EXAMPLE

```
<!DOCTYPE html>
```

```
<html>
```

```
<body>
```

```
<h1>CSCI-A340 Introduction to Web Programming</h1>
```

```
<?php
```

```
    echo "My first PHP script";
```

```
?>
```

```
</body>
```

```
</html>
```

This file must be saved with a .php extension, and a PHP enabled web server (e.g. XAMPP or WAMP) must be running to interpret the PHP.

PHP tag

HOW DOES PHP WORK?

- When a client requests a file with a **“.php”** extension, the web server sends the request to the PHP interpreter for pre-processing.
- PHP interpreter will interpret the code and returns HTML back to the web server, which is then sent to the client.

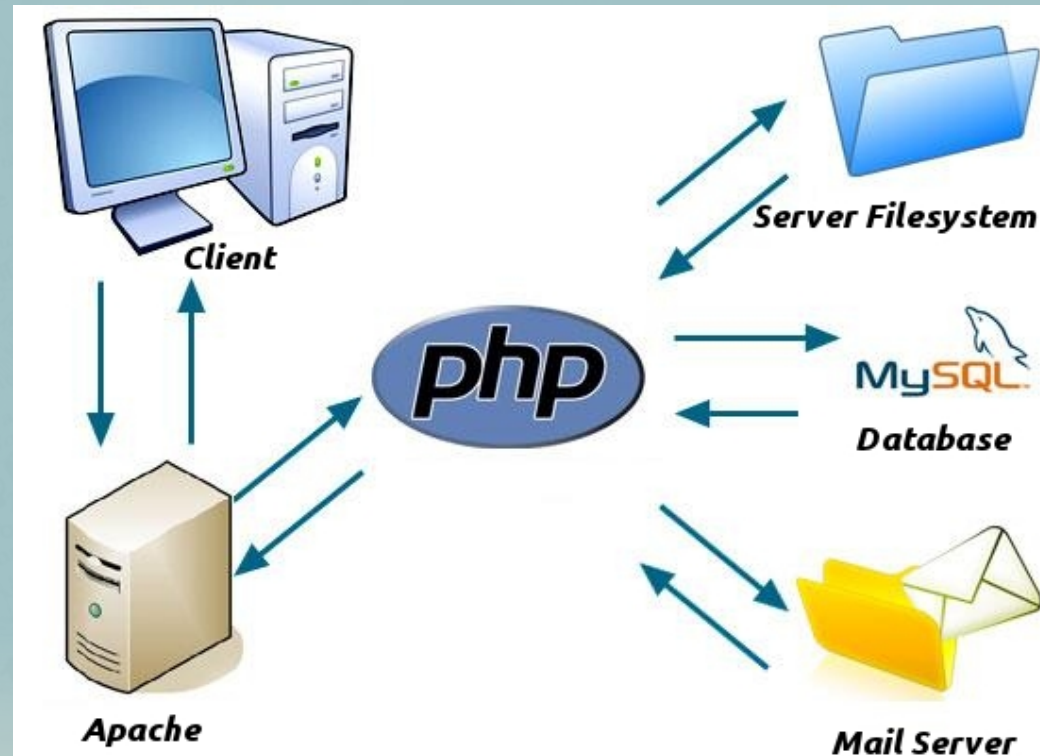


Image from:

<http://www.santarosa.edu/~jperetz/spring2012/dreamweaver/>

CLIENT-SIDE VS. SERVER-SIDE

- What distinguishes PHP from JavaScript is that PHP code is executed (interpreted) on the server, it generates HTML, which is then sent to the client.
- The client (browser) would receive the results of running that script, but would not know what the underlying code was.

IMPORTANT RESOURCES

- <http://www.w3schools.com> – tutorial for HTML, CSS, JavaScript, XML, PHP, SQL
- <http://www.php.net> – documentation for PHP
- <http://www.xampp.org> – source of XAMPPlite
- <http://www.wampserver.com/en/> - Source for WampServer
- <http://www.iusb.edu/~libg/ref/> – online copies of over 250 books on PHP, Java scripts, HTML, etc.