

# Web Dev Environment

install & setup

CIS 1152 Adv Web Dev

Steve Ruegsegger

Modified by: Peter Chapin (with permission)

January 13, 2023

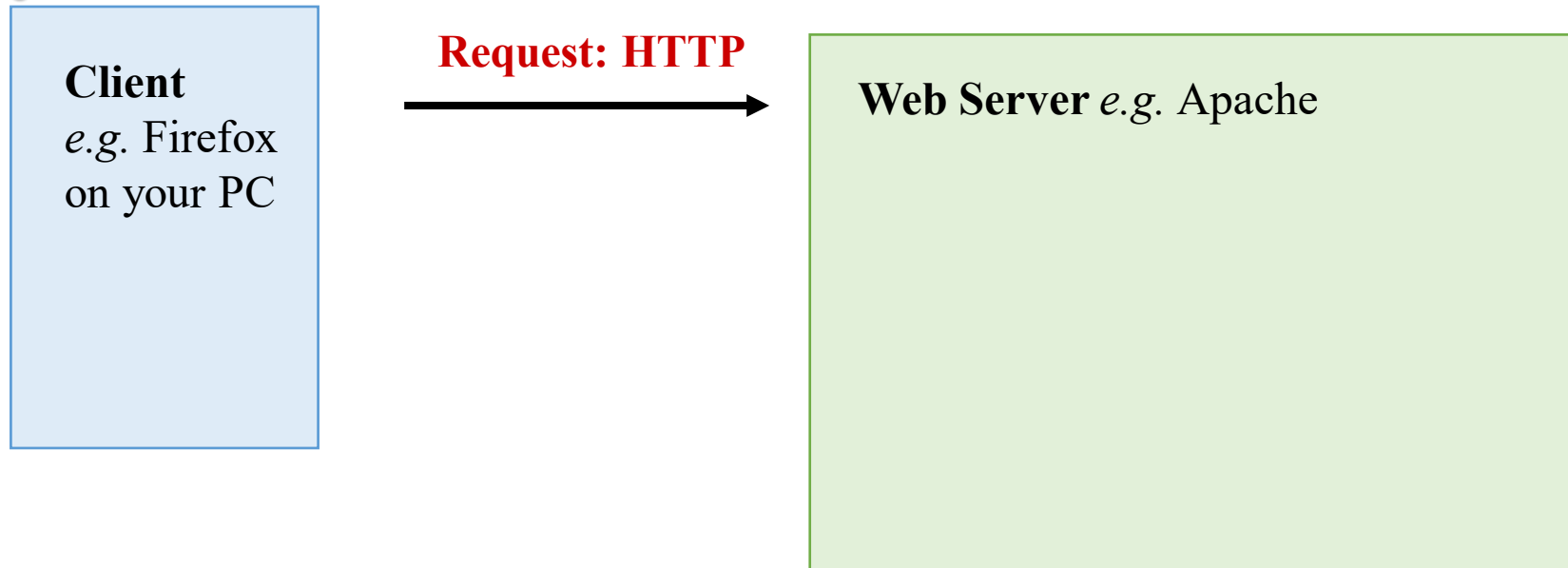
# Outline

- Goal: Let's understand the big picture of the course
- Objectives:
  1. Understand the Big Picture of the technical skills (highly employable and wage-earning) we are trying to achieve by the end of this course.
  2. Introductory terms: level-set
  3. Information flow: three versions of the same file
  4. Setup your **environment** which will be used for the *entire* course!

# The Big Picture

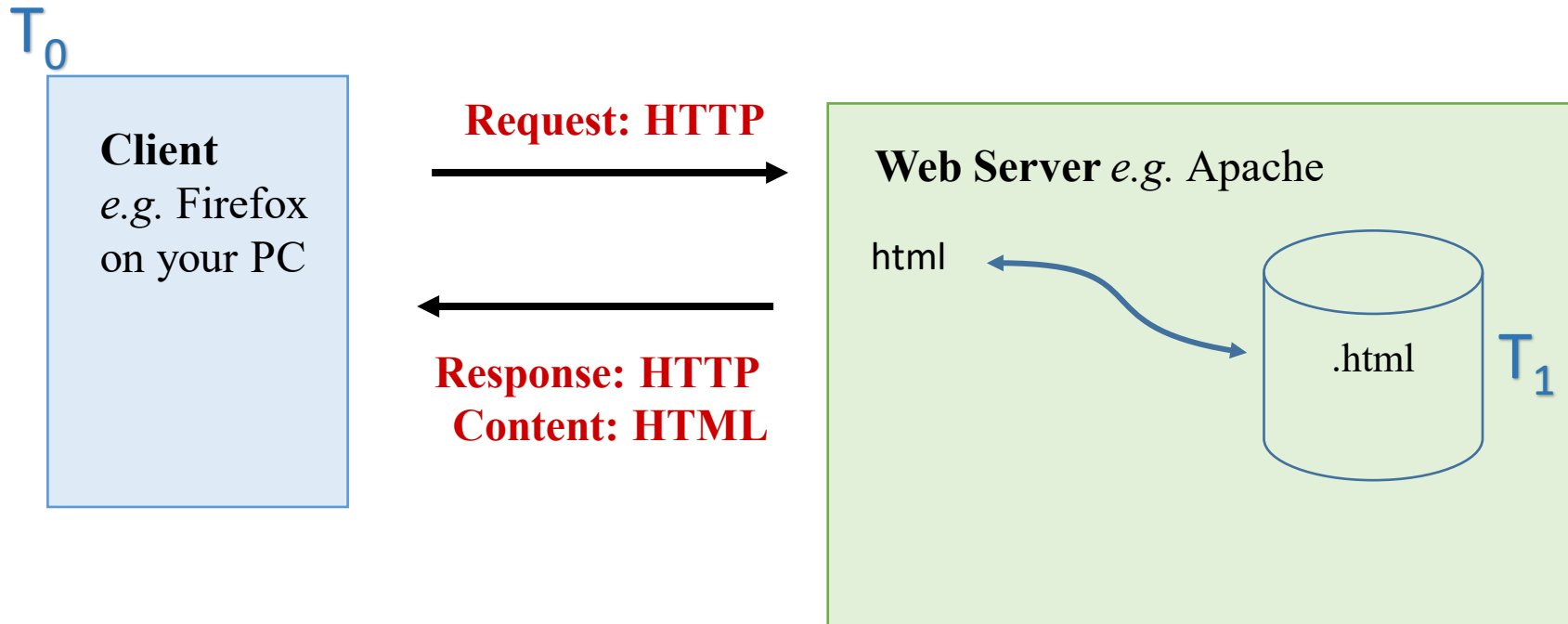
3-Tier web applications

# The 3-tier web system

 $T_0$ 

The 'customer' (i.e. user) is at the client (their own laptop) and they request a page from your web server using HTTP (Hyper-Text Transfer Protocol)

# The 3-tier web system



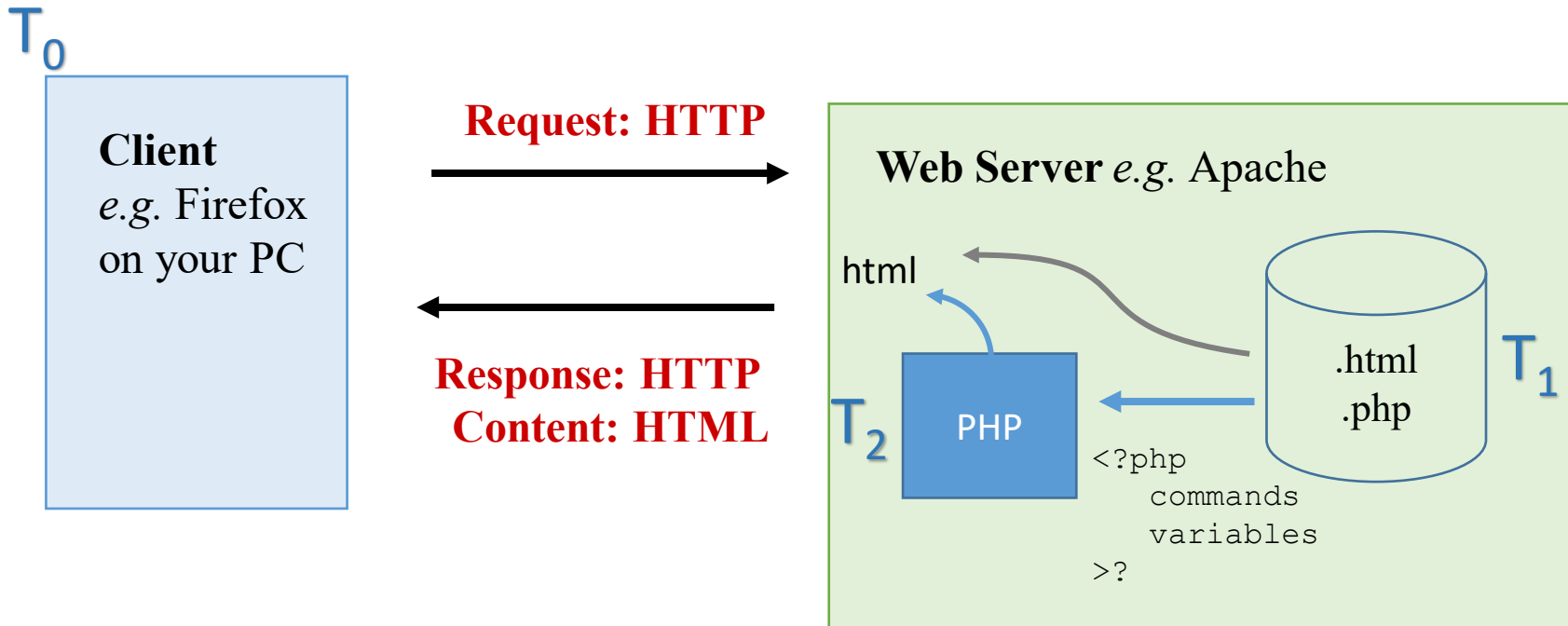
Let's do a demo ...

What did you see?

.html is a static file

.php → something strange is going on...

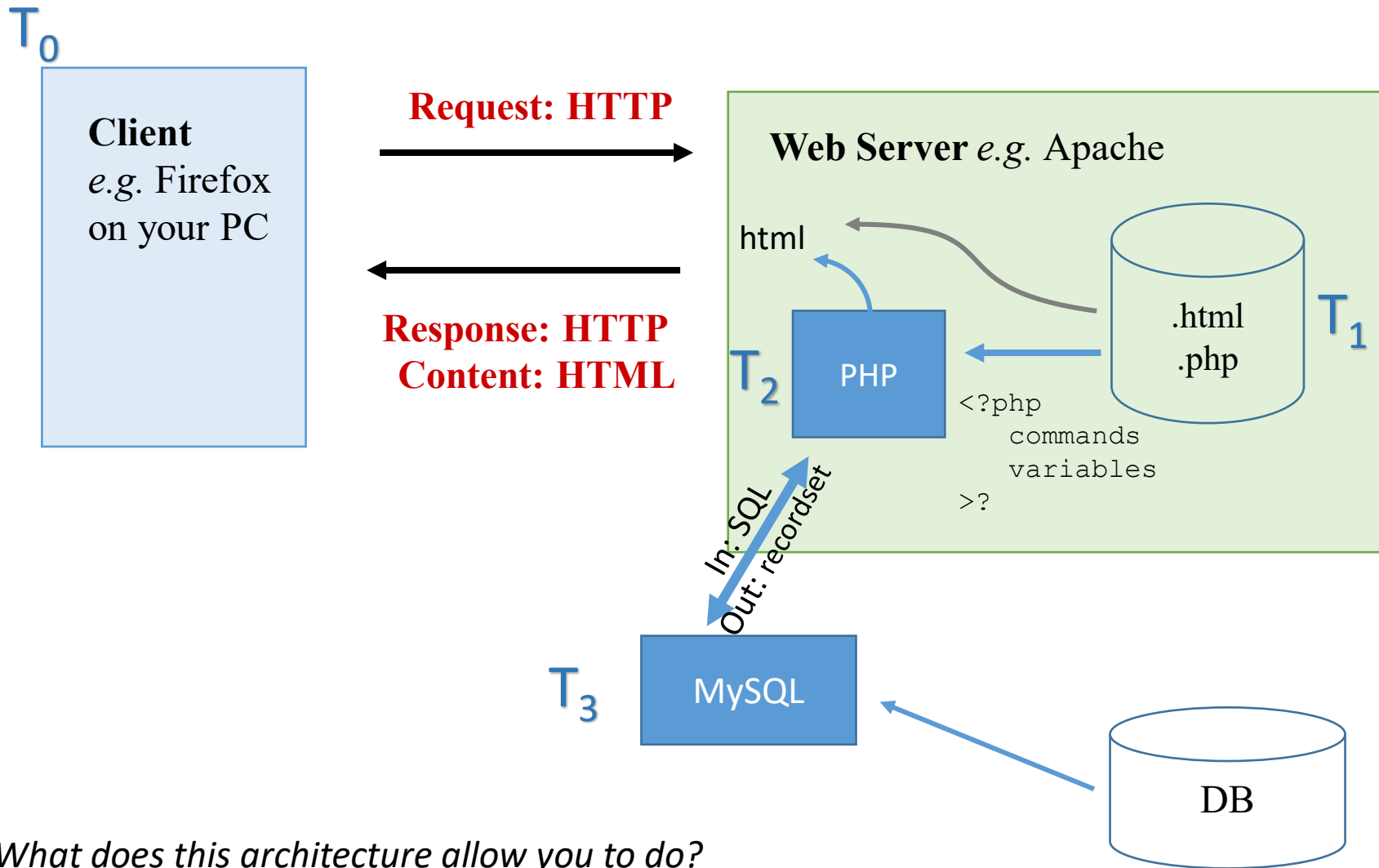
# The 3-tier web system



*What determines which path a file will take in apache?  
Can you describe what that PHP engine doing?*

*But these are still static web pages.  
We need dynamic, custom web apps.  
Where to get those variables...?*

# The 3-tier web system



*What does this architecture allow you to do?  
Has anyone gotten rich off this simple idea?*

# Introductory terms

level set



## Terms to know

- XHTML
- DOM
- CSS
- PHP
- JavaScript
- jQuery
- MySQL

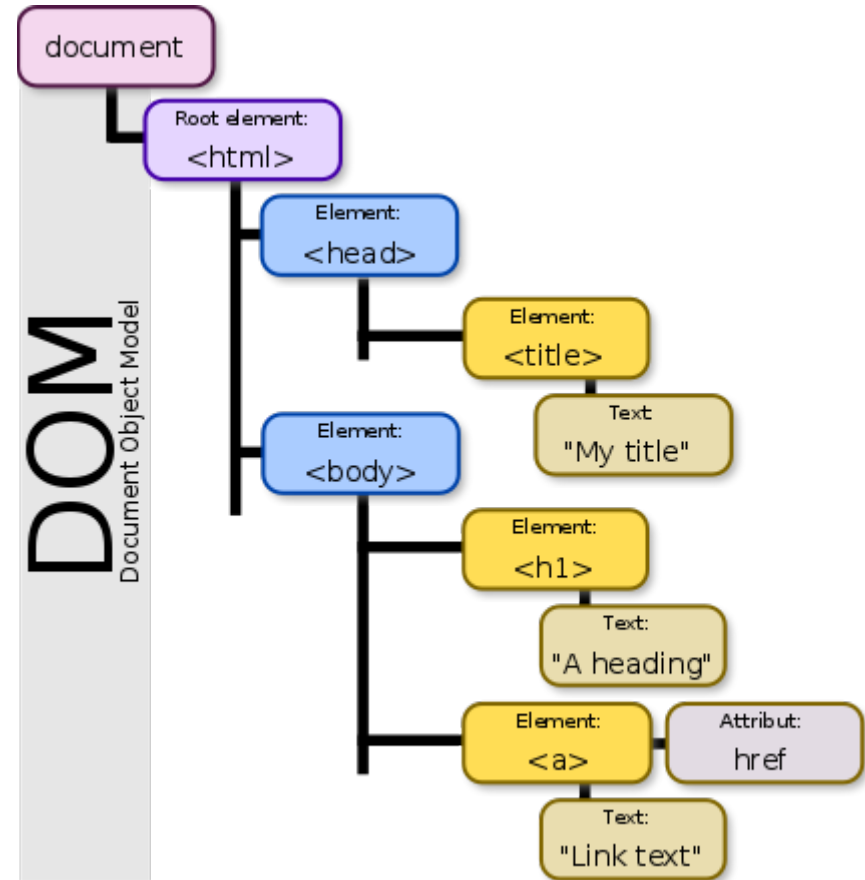
# XHTML

- HTML (up to version 4) – a Standard Generalized Markup Language (SGML) application. SGML is quite old (1980s).
- XML – Extensible Markup Language. The “new” SGML.
  - Not covered in this course
  - Nested open and close tags

```
<parameters><options>  
  <key>movie</key>  
  <value>Star Wars</value>  
</options></parameters>
```
- XHTML – eXtensible HTML (*i.e.* better)
  - XHTML v1 == HTML v4 in XML form (rather than SGML form)
  - Allows HTML’s features to grow (expand) quickly
  - HTML5 has two forms:
    - An HTML form (more common)
    - An XML form (more precise)

# DOM

- Acronym: Document Object Model
- The entire web page is tree structure of nodes.
- Each node is an object representing part of that web page (i.e. document)
- Those node/objects can be changed and the web page will change/adjust “on the fly” – in real time – dynamically.



# CSS

- Acronym: Cascading Style Sheets
- Purpose: separates out the presentation from the content. Layout, colors, fonts are separated into an independent layer.
- Content (objects) are linked by classes where the entire class can have a presentation change.
- Element tags:
  - *id*: should be unique within the document
  - *class*: identifier for multiple objects
- Specifying elements:
  - A dot . begins a class
  - A hash # begins an id
- Attributes in key:value pairs

```
h1 { color: white;
background: orange;
border: 1px solid black
padding: 0 0 0 0;
font-weight: bold;
}
/* begin: seaside-theme */

body {
background-color:white;
color:black;
font-family:Arial,sans-serif;
margin: 0 4px 0 0;
border: 12px solid;
}
```

The logo for CSS, featuring the letters 'CSS' in a bold, white, sans-serif font inside an orange rounded rectangle.

# PHP

- Acronym
  - Old: Personal Home Page – 1994
  - New: PHP Hypertext Preprocessor
    - Recursive
    - This name makes sense, right?
- What does it “do?”
- Server side
- Part of CGI – common gateway interface
  - What is a CGI?
- Currently on PHP8

# JavaScript

- Programming scripting language
- Purpose: *specifically* created to make the web page dynamic.
- It has nothing to do with Java. The naming is unfortunate.
- Client-side
- What is server-side JavaScript language engine called?
- Features:
  - Functions, loops, variable, arrays – normal stuff
  - Access to the DOM
  - Can make it's own HTTP calls and receive answers in the background. This is called AJAX.
  - AJAX – Asynchronous JavaScript and XML

# jQuery

- A JavaScript library
- Defines a simple way to access the DOM within JavaScript programming
- Also makes Ajax easier

# MySQL

- An open source database management system.
- SQL: Structured Query Language.
  - Relational databases, an IBM invention
  - SQL, also from IBM
- Basic concepts:
  - The TABLE; ROWS = observations; COL = variables

Field titles	<b>Title</b>	<b>Author</b>	<b>ISBN</b>
Field Types	char(50)	char(50)	char(50)
Field rules			NOT NULL
Key information			PRIMARY KEY
Records:	The Tempest	Shakespeare, William	4433-2222-8097af
	Rutabegas	Potter, Harry	44-3321-4356x
	etc...		



# Assumptions

- It is assumed you already know HTML & CSS.
- If not, you might want to brush up.
- My recommendation is **Ryan's Tutorials:**
  - <http://bit.ly/2JNAU3O>
  - He has a way of teaching in a simple manner.
  - Easy reading.
  - I recommend just reading the whole tutorial on a subject. I won't take that long.

# Ryan

*(These 3 are for next year)*

HTML & CSS



Home - Vermont Tech Home    Ryan's Tutorials -

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## Ryan's Tutorials

A collection of introductory technology tutorials.

*Linux Tutorial*

An introduction to the Linux command line using the Bash shell. This tutorial introduces a series of commands and concepts that will allow you to effectively manage a Linux/Unix system.

*Bash Scripting*

An introduction to Bash scripting on the Linux/Unix command line. Learn how to automate tedious and repetitive tasks to make your life happier.

*Binary Tutorial*

Learn how binary numbers work, how to convert them to decimal, hexadecimal and octal and how to do binary addition, subtraction, multiplication and division.

*HTML Tutorial*

Learn how to create web pages by writing clean and elegant HTML. In this tutorial you'll master the basic HTML tags.

*CSS Tutorial*

Learn how to style web pages by writing clean and elegant CSS. In this tutorial you'll master basic CSS.

*Regular Expressions*

Learn how to write regular expressions, a powerful pattern matching tool. In this tutorial you'll learn how to write elegant and powerful regular expressions.

*Programming Challenges*

A range of programming challenges, at varying degrees of difficulty, to help you develop your coding skills and problem solving ability.

*Problem Solving*

Learn how to be a better problem solver/ trouble shooter. This tutorial is a great refresher on how to get out of trouble when those gremlins rear their ugly little heads.

*Boolean Algebra*

Learn how to read and manipulate Boolean Algebra. In this tutorial you'll learn about operators, laws and manipulating expressions.

# Go Blue!

- Well, I did my graduate studies at [University of Michigan](#), so I hope it's OK to promote them.
- This UMich course on **Coursera** is pretty good:  
*Building Web Applications in PHP*
- You can take it online for free... look for the "audit" option.
- <https://www.coursera.org/learn/web-applications-php>

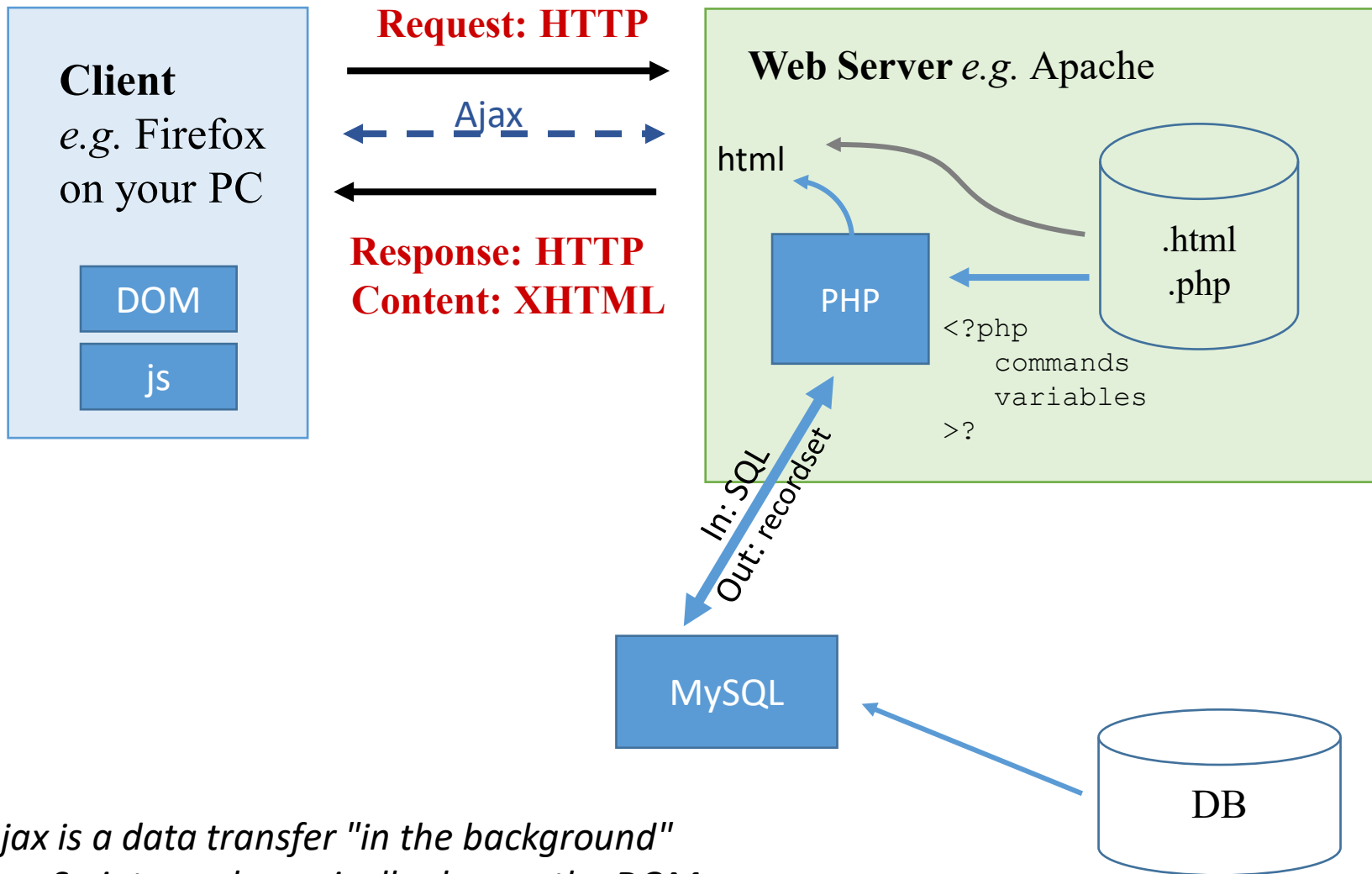
The screenshot shows the Coursera course page for "Building Web Applications in PHP". The page is dark blue with white text. At the top, there's a search bar and navigation links. Below that, it says "Offered By UNIVERSITY OF MICHIGAN". The course title "Building Web Applications in PHP" is prominently displayed, along with a 4.7 star rating from 3,143 reviews. The instructor is Charles Russell Severance. A yellow "Go To Course" button is visible, with text indicating "Already enrolled" and "Financial aid available". At the bottom, it states "101,787 already enrolled".

The screenshot shows the syllabus for the "Building Web Applications in PHP" course. It lists two weeks of content. Week 5 is titled "Introduction to PHP" and is 4 hours to complete. It includes 7 videos (Total 59 min), 1 reading, and 2 quizzes. Week 6 is titled "PHP Arrays" and is also 4 hours to complete. It includes 6 videos (Total 41 min), 1 reading, and 2 quizzes. The syllabus is part of the "Web Applications for Everybody Specialization".

# Information flow

3 versions (views) of the same file

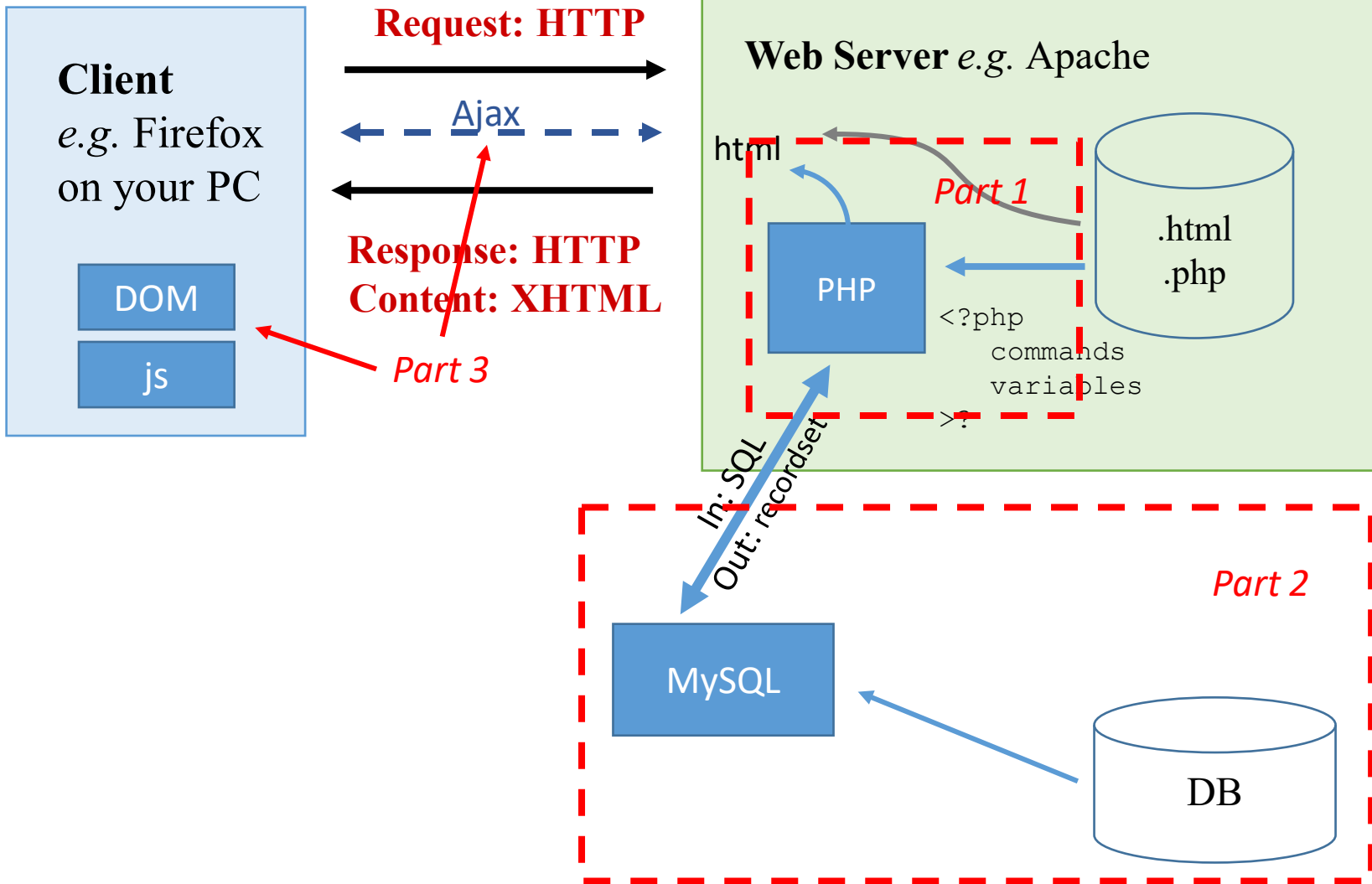
# Back to the Big Picture



*Ajax is a data transfer "in the background"*  
*JavaScript can dynamically change the DOM*

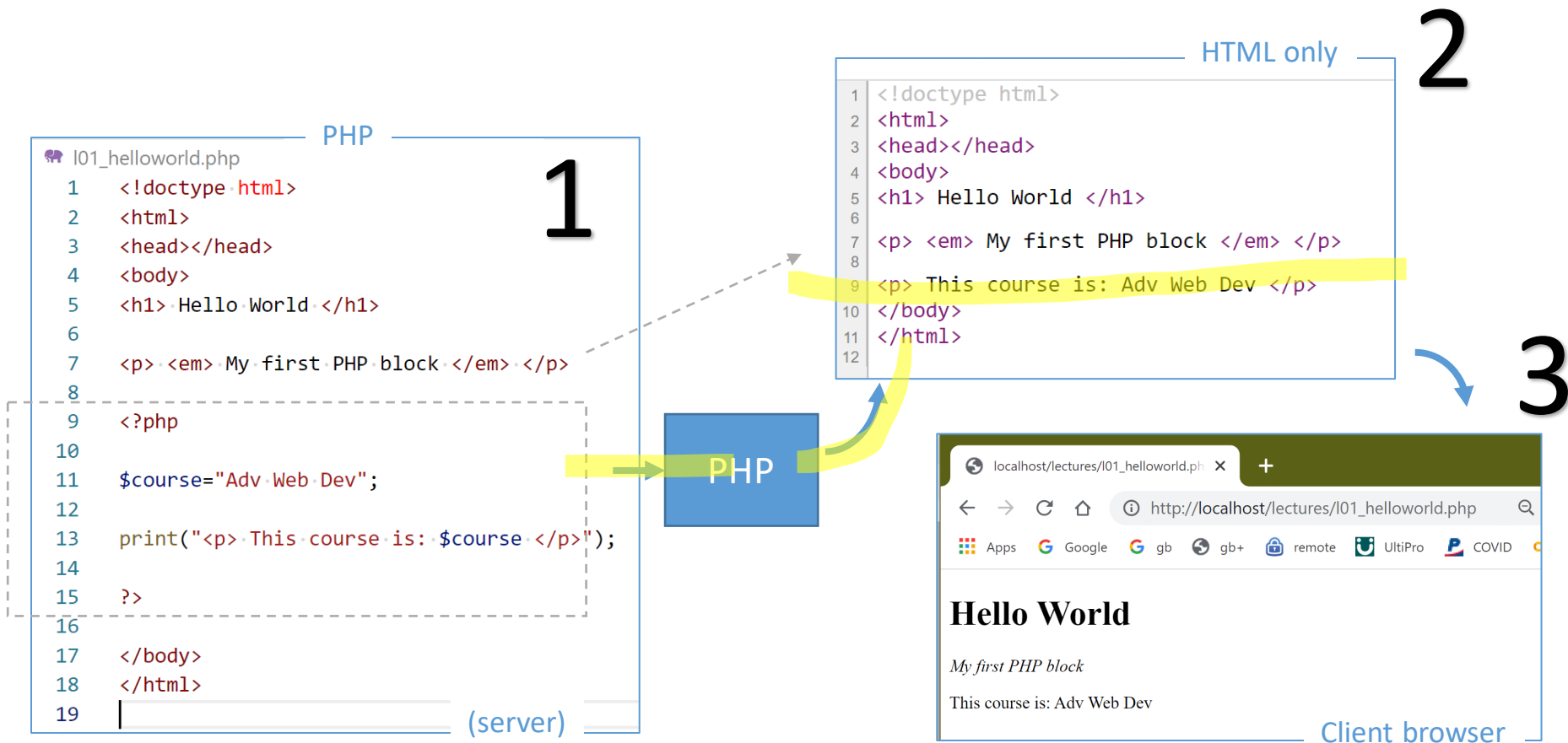
# Back to the Big Picture

*This is the course – in 3 parts*



# 3 versions (views) of the same file!

- We have 2 languages and 3 versions of same file
- *Do you understand this?*



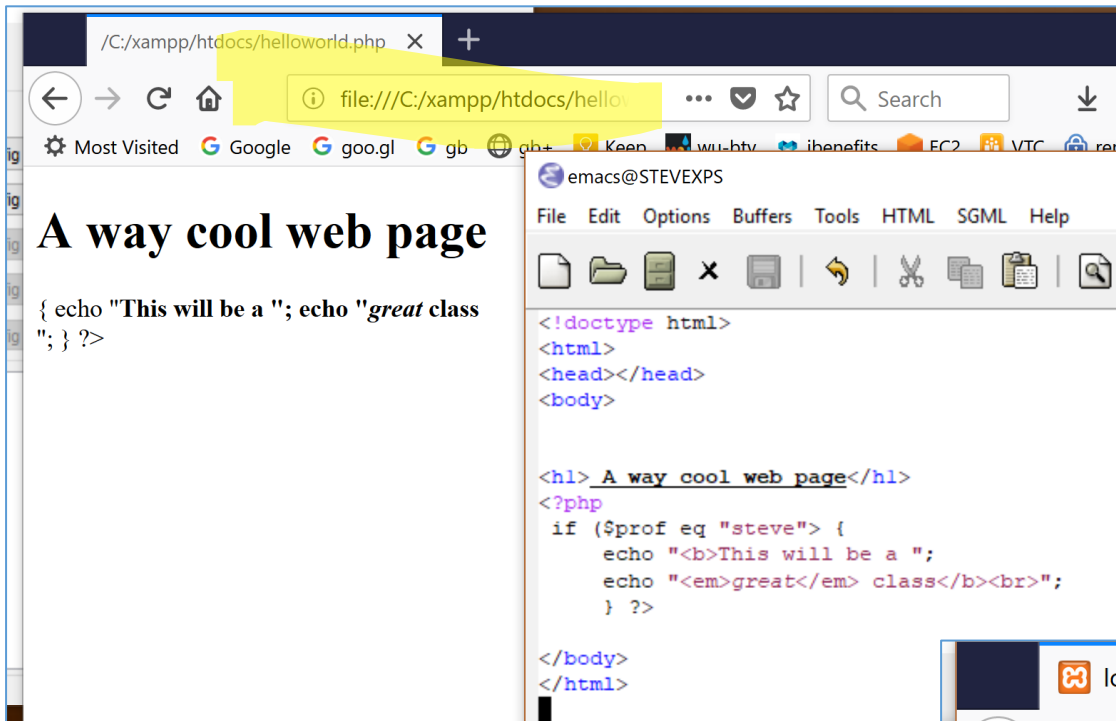
## 3 versions of the same file!

Algorithm for these 3 versions:

1. PHP code *sits inside of* the HTML document
2. Due to .php file extension, the PHP file *passes through* a PHP CGI language interpreter first
3. That PHP language interpreter *detects* any PHP blocks and *ignores* the other HTML stuff.
4. The PHP blocks are *ripped out* from the file, *interpreted* and *replaced* with the HTML results back into the exact same spot.
  - PHP outputs HTML only
5. The HTML file with no PHP is now sent by apache via http back to the client requestor

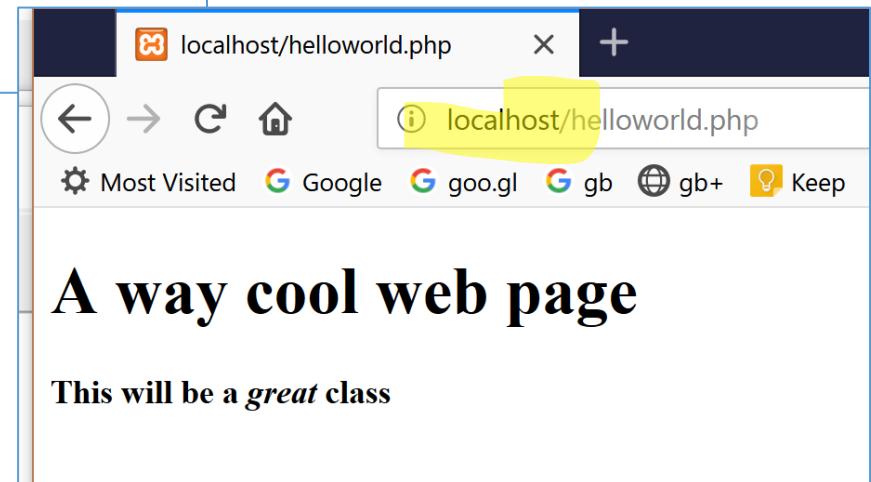


# What if the PHP engine wasn't there?



If PHP is not working.

If PHP is working.



# Competition with PHP

- Other languages and technologies can also sit in between the server and client and change the HTML output for client while on the server:
  - Node.js
  - Perl/Python
  - Bash
- How is Perl/Python/Bash *different* than PHP?
  - This is a major different that I really want you to understand!
  - It has to do with the “[default language](#)”
  - Consider this perl script:

*Only this part  
would be in PHP.*

```
#!/usr/bin/perl
print "<html><head><title>My title</title></head>\n";
print "<body><table>";
for ($i=0; $i>10; $i++) {
    print "<tr><td>coll</td><td> $i </td></tr>\n";
}
print "</table></body></html>\n";
```

# Environment

setup for the course

# Your Computing Env

- XAMPP
  - X - any OS
  - Apache - web server
  - MariaDB=MySQL (fork) - DB
  - P = PHP, Perl Python - scripting lang
  - What is LAMP?
- IDE:
  - We will use PhpStorm for development in this class
  - Many other options exist. I hope you explore some later on!
- Computer:
  - Lab computers work
  - Your own laptop will also work fine (Windows or Mac)

# Prep for Lab 1

## Setup your **Environment**

### 1. What **editor** are you going to use?

- Notepad++
- ★ • Visual Studio Code (VSCode) <https://code.visualstudio.com/>
- Brackets: <http://brackets.io/>
- ★ • PhpStorm. A full-fledged IDE for web development from JetBrains

### 2. Servers (web and DB and scripting)

- **XAMPP** – X = cross-platform, lighter (highly recommended)  
<https://www.apachefriends.org/index.html>
- Yes, there is WAMPserver, etc. → but I'm **not** recommending this...

# XAMPP version

Apache Friends Download Add-ons Hosting Community About Search.. Search EN

## XAMPP Apache + MariaDB + PHP + Perl

### What is XAMPP?

XAMPP is the most popular PHP development environment

XAMPP is a completely free, easy to install Apache distribution containing MariaDB, PHP, and Perl. The XAMPP open source package has been set up to be incredibly easy to install and to use.

**Download** ✓  
Click here for other versions

XAMPP for **Windows**  
8.1.1 (PHP 8.1.1)

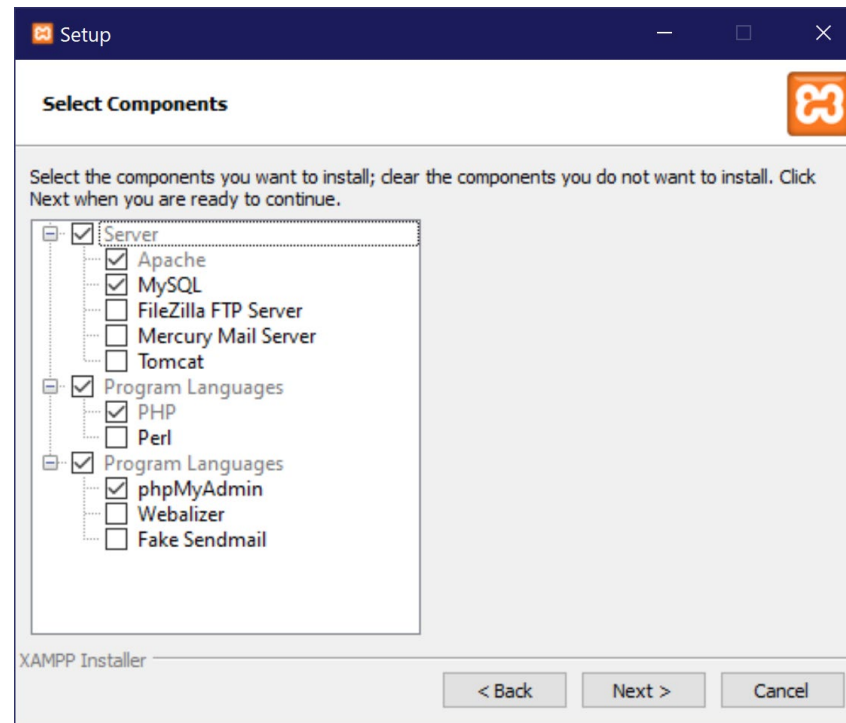
XAMPP for **Linux**  
8.1.1 (PHP 8.1.1)

XAMPP for **OS X**  
8.1.1 (PHP 8.1.1)

v8.2.0 is the latest as of January 2023.

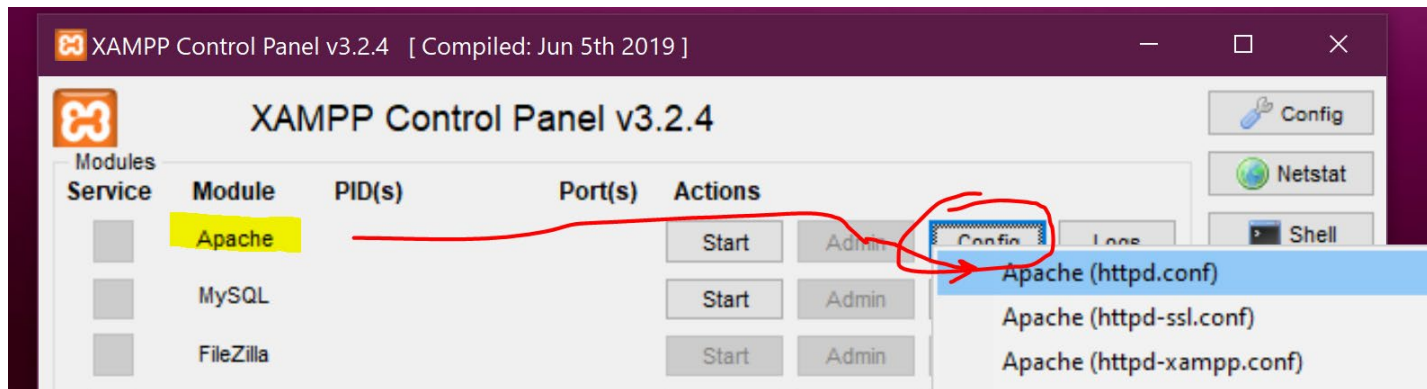
# XAMPP setup options

- You don't need every install option. Just the basics.



# Apache DocumentRoot

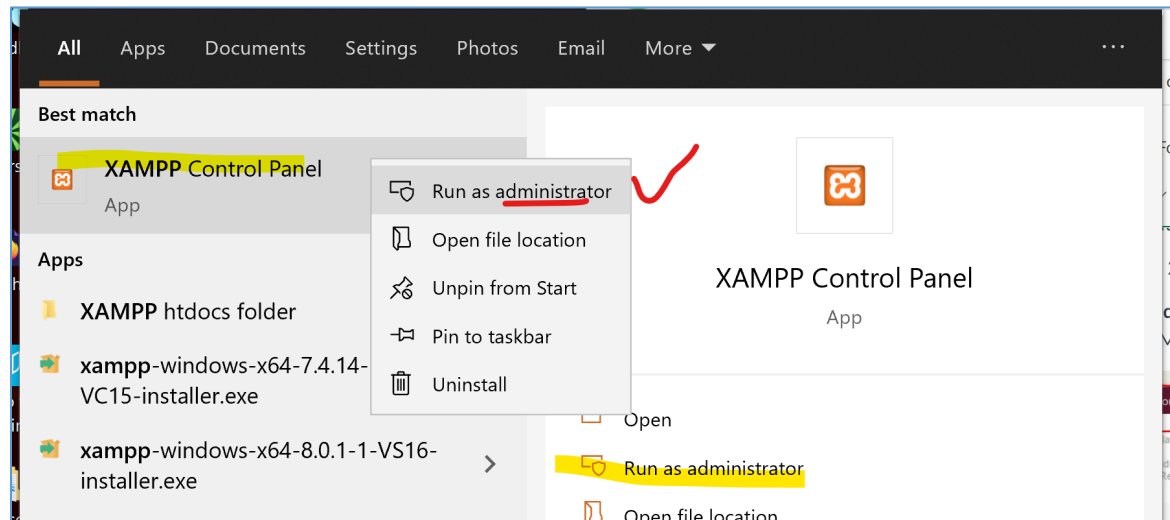
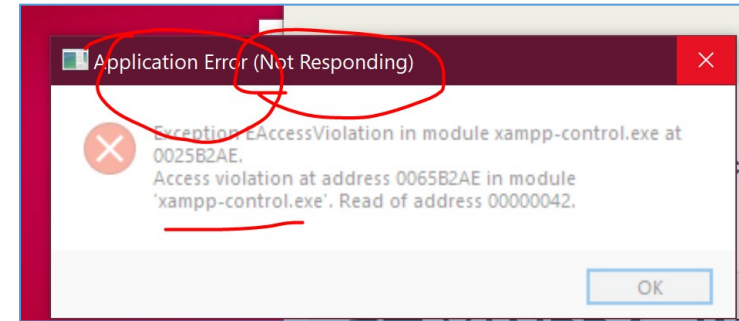
- I change the default Apache DocumentRoot.
- Why?
  - I don't want to copy my course files to their default to "run" the php.
  - I'd rather have the default web location point to my course files.





# Running XAMPP in Windows

- **Very important note!**
- The default method for running XAMPP in *Windows* will give you an **error!**
- It is the purposeful result of a security protocol and protection -- so they could protect key config files.
- You **must** XAMPP run as “admin” [No longer true (as of January 2023)]



# XAMPP common mistake

- A **common mistake** is to move the XAMPP server folder from it's original location to somewhere else.
- This is a bad idea.
- There are env vars -- one called ServerRoot -- which points to the original location. If you move the XAMPP folder, things break.
- In general, install XAMPP where you want it to be.
- You can always delete the old version and reinstall XAMPP to a new location. I've done that several times.