What is front-end vs. back-end?

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

Explaining the two concepts

- In any web interaction you have, you're going to use a browser to access information on a server
- **Front-end programming is a set of instructions that tells your browser what to show (images, text, spacing, buttons, etc.)**
- **Back-end programming is a set of instructions that does things like fetching information, saving information, and running calculations**
- The front-end instructions get processed on your browser, which uses your computer's RAM and processor

  Too many websites open will slow your computer down
- Back-end instructions run primarily on the server you accessed the information from and uses its hardware

- Back-end programming = Server-side programming
- In order for a website to run effectively, both front-end and back-end programming must operate together

See you next lecture!

What is a language?

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

Explaining programming languages

- Programming is a way to write instructions for a computer to understand and work with
- Computers speak machine code
- **A programming language is a set of rules you have to follow in order for your computer to understand you**
- Programming languages are similar to human languages. They are only good for software or hardware that is designed to understand them
- Programming has developed over the years as more and more people contributed to it
- Even though newer languages are more efficient, a lot of products (ex. operating systems) we use are still based on old languages

See you next lecture!

HTML

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

What HTML is and what it's used for

- **HTML = HyperText Markup Language**
- HTML was created by people who wanted to increase the efficiency of sharing research
- They first created the HyperText Transfer Protocol (HTTP), and with this, people could use HyperLinks in a document to embed links to other documents
- Then, the researchers wanted to markup the texts with highlights, underlining, bolding, and so HTML appeared

- HTML is by far the simplest web language you can learn and it's included in every website

- HTML is used for formatting text, tables, images, buttons, and it assigns attributes to these objects

- There are 142 tags you can use in HTML
- HTML5, the latest version, lets you embed anything you want into a page, like music, videos, games

See you next lecture!

CSS

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

What CSS is and what it's used for

- **CSS = Cascading Style Sheets**
- CSS allows you to have more control over the page than HTML does
- With CSS, you can create a variety of new attributes and apply them to HTML elements on the page, by using what's called a "class"
- For example, you can arrange elements on the page wherever you want them by describing the location
- Any attribute you give to a class will be given to whatever you wrap in that class tag
- Class rules can be created in the same document as your text, separated at the top, or in a separate .css file that will be referenced in the original document
- Every developer has to have a basic understanding of CSS

See you next lecture!

JavaScript

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

What JavaScript is and what it's used for

- JavaScript is not the same thing as Java, which is a back-end language
- JavaScript was created by Marc Andreesen and it was originally called Mocha
- It's the hardest language to learn
- **JavaScript is in charge with the website interactivity**
- It was originally created for facilitating the process of filling out forms; before JavaScript, you couldn't know if the username you're trying to use was already taken
- JavaScript allows websites to run faster, it makes the site experience more interesting and enjoyable

See you next lecture!

Python

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

The pros and cons of Python

- Python is a versatile programming language and it's easy to learn
- It's considered a general purpose programming language
- Python is an expressive language because it resembles very closely the English language
- Other languages make you learn various signs that if you forget to include, the code fails
- Python looks like this:

  if a is not 5:
- Who uses Python: Google, YouTube, Dropbox, NASA
- Python is a high level programming language, which means it's the farthest away from machine code, so it's less precise

- This makes it harder to have full control over what you're trying to do

- The downside to being a general purpose language is that every time you use it, you have to install other technologies to help interpret the code for you

See you next lecture!

PHP

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

What you need to know about PHP

- PHP = PHP Hypertext PreProcessor
- PHP is one of the most well-known back-end languages and it has the largest community of developers
- It's fairly easy to learn but it has a few inefficiencies because it's so old
- PHP looks like this:
  Display "if (a!=5) {..."
- PHP is open source, anyone can use it and set it up very quickly
- PHP is the easiest to find and recruit developers for, because of its large community
- It has a negative reputation because it's free

- Although it has some drawbacks, PHP is flexible, well supported, and easy to use

- Who uses PHP: Facebook, WordPress

See you next lecture!

Ruby

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

What you need to know about Ruby

- Ruby is the newest programming language, it's popular and a bit controversial
- It was designed to increase speed
- It includes a lot of automation and intuitive changes that save time
- Ruby has a small community and therefore the prices are very high for a Ruby developer
- It has a lot of inexperienced people because it's so new
- It has poor performance when used for larger and larger systems
- Who uses Ruby: AirBNB, Shopify, Etsy, Groupon

See you next lecture!

What's a tech stack?

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

The definition of tech stacks and examples

- The operating system acts as a giant interpreter for your computer, and as a result any software or program works within the space that it's created
- We usually think of this like a "stack"
- Any set of technology of programming languages that works together and enables each other will and can be referred to as a stack
- Web stack = The combination of technologies a website uses
- Tech stack = Web & mobile apps
- For example, a website can be built using the LAMP stack:

  Linux (operating system), Apache (server system), MySQL (database), PHP (back-end language)

- Facebook uses LAMP

- If you change one of the pieces, you can get WAMP (Windows), or MAMP (MacOS)

See you next lecture!

Common stacks for web

LECTURE SUMMARY

PRE-PROGRAMMING

Covered in this lecture:

More examples of stacks

- Any web stack has 4 components: operating system, server system, database, back-end language
- LAMP is the oldest and most popular stack
- When you have different needs for your technology, you can use other stacks
- WINS = Windows Server, IIS Server, .NET, Microsoft SQL Server
- WINS is great for big enterprises, because it focuses on security and IP protection
- It's also very slow to use, expensive, and you have to train people on how to use it
- MEAN = MongoDB, Express.js, Angular.js, Node.js
- MEAN is great for small startups that need cutting edge technology, speed, and a polished user interface

See you next lecture!