

Web Development Fundamentals

What is web development?

- The ability to create a website for your laptop, tablet or phone
- Typically we create one website that looks and acts well on all these devices in the same codebase
- This is called “responsive web design”.
- We write “code”, usually in English, that tells programs what to do.
- There’s a certain way to write the code and it’s a little bit different for each programming language
- These writing styles are called “programming syntax”
- Websites are made up of 4 main components
 - HTML
 - The “bone structure” of your webpage
 - CSS
 - The part that makes your website look beautiful and full of colour
 - JavaScript
 - The interactivity that happens when you click a button or type in a box
 - Server-side
 - This is the hidden code that executes on a server when your browser loads a website.
 - Python
 - PHP
 - Node.js

How to get into web development?

- Is it hard to get into web development?
 - The honest answer is no, it’s not hard.
 - It’s a lot like learning how to cook
 - You learn a thousand small things, not one giant thing
 - It will take time to learn, but it’s not hard to learn
- Do I need to be super smart to start coding?
 - Nope, any normal person can do it!
 - People think people are as smart as Bill Gates or Mark Zuckerberg
 - Honestly, we’re not that smart. We just know our tools and know how to find answers on the internet
 - That’s the brutal and honest truth about my profession
- Am I too old to learn to code?
 - Absolutely not
 - I’ve seen students in their 70’s learn to code, and they’ve been coding very well for several years now
 - I’ve seen people in their 60’s learn to code and get a job at web development agencies
 - You do not need to be “young” to learn how to code
- Do I need a college/university degree?
 - No, that’s not necessary
 - Though college/university will be helpful to understand how computers work, it’s not necessary to learn how to code

- I taught myself how to code at the age of 10 in 1999
 - No college would have taken a 10-year-old
 - Today, I've still not attended college or university and I've worked with big names like Mozilla, NYPR, the NHS and NASA
- Is coding expensive?
 - Coding is only as expensive as you make it
 - Most of our tools are 100% free
 - Web development education can be expensive if you attend a bootcamp or pay for a mentor
 - Your best route is to take inexpensive online courses and read blog posts and tutorial websites
- What do you need to get started?
 - A laptop or desktop. You cannot code efficiently on a mobile phone
 - A text editor program
 - Internet access

What does it take to get into web development?

- Determination
 - Learning to code is not hard, but it is BIG
 - You'll be learning 1000 small steps (most you can Google when you don't remember)
- Dealing with overwhelm
 - There is A LOT to learn
 - Again, it's all small stuff, but it can feel very overwhelming
 - Don't try to learn it all at once, learn how to code in steps
 - I suggest learning HTML first
- Support groups
 - You don't need a personal mentor to start
 - Find a support group where you can ask questions without being judged
- Tenacity
 - You will have hard days, that's normal
 - But you need to push through those hard days
 - I suggest learning 3 new things about web development every day, even if they are small, useless, facts
- Practice until it hurts
 - Practice, practice, practice
 - Like anything in life, coding is a skill that gets easier with practice
 - And once you have enough practice from tutorials and courses, make sure you start working on your own ideas
 - If you work on real world problems, you'll run into real world coding problems (and solutions)

Web development tools

- Text editor
 - A special program that doesn't add "hidden" data to your files
- Browsers
 - Different web browsers render content differently

- Download
 - Google chrome
 - Mozilla firefox
 - Safari (not available on windows)
 - Microsoft edge
- Command line program
 - Every computer has a command line program by default
 - On windows
 - Your command line tool is cmd
 - On mac
 - Your command line tool is terminal
 - On linux
 - Your command line tool is bash
- Internet access
 - It's impossible to remember everything in web development
 - For that reason, we do a lot of searching for answers on the internet
 - You'll want a good enough internet connection to be able to Google your questions, or ask questions in a Facebook group

How websites are created

- Scripting and programming languages
 - We write code in a text editor that satisfies the “reading” program called a browser
 - If we said: `Hello World` in HTML
 - It would look like this
 - **Hello World**
 - The `` and `` tell it to be bold
 - These instructions tell the browser what to do
- Text editor
 - A special program that doesn't add “hidden” data to your files
- Writing code
 - Is a lot like writing a paragraph
 - It just looks different
 - We call this “syntax”
 - We follow rules that programs like a browser are looking for
 - For example
 - `Hello World`
 - `<i>Hello World</i>`
 - Outputs
 - **Hello World**
 - *Hello World*
- HTML, CSS and JavaScript
 - These are two scripting languages and a programming language
 - And all three of these technologies are used on almost every website that exists today
 - HTML files are saved as .html file extensions
 - CSS files are saved as .css file extensions
 - JavaScript files are saved as .js file extensions
 - We write all this in a text editor and use different file extensions

- Programming languages
 - When you hit a website, a server is sending the HTML, CSS and JavaScript to you
 - But the code that executes on the server can be a different coding language, such as Python, PHP, Node.js or even Java
 - We also write this code in a text editor
- Databases
 - When you try to log in to a website, your data is sent to a server that executes “backend” code (code we cannot see) and it talks to a hidden database
 - These databases are what store our passwords, usernames, email addresses, which photos we upload, which posts we liked and so on
 - A database is the “memory” of your website
- Code you can and can’t see
 - All HTML, CSS and JavaScript can be seen by your end users
 - So never store secrets in there
 - If you right click on any webpage and click “view source”, you can see the raw HTML, CSS styling and JavaScript
 - This is “frontend” code
 - “Backend” code runs on a server and you cannot see it: we don’t have access to it

Frontend vs. Backend

- Frontend
 - Is made up of HTML, CSS and JavaScript
 - These small files are sent to your browser, and your browser reads them, interprets them, and then displays it for you
 - Right click on any web page and select “view source” or “inspect” and you can see the entire frontend code
- Backend
 - Is a programming language like Python, PHP or Node.js that can’t be seen
 - It usually produces HTML to send to your browser, but the logic behind the scenes is never exposed
 - This is useful for securely handling passwords, credit card numbers, and other sensitive data
 - Usually connects to a database where your data is saved for a period of time
 - This lets you log in to a website after 6 months – your login information was saved in a database, and the data was processed using a backend programming language

What is fullstack web development

- Frontend + backend + database
 - A fullstack web developer can write frontend code and backend code
 - This usually means they write a lot of JavaScript, along with a backend language like Python
 - A backend language can dynamically create HTML, CSS and JavaScript too
- The “stack”
 - Is a term we use to talk about all the technologies a company is using
 - LAMP is a common “stack”
 - It’s:

- Linux, Apache, MySQL (Database) and PHP or Python (Backend)
- MERN is another common “stack”
- It’s:
 - MongoDB, Express, React, and Node.js
- Less specialization
 - A fullstack web developer, one who writes frontend and backend code, often doesn’t have specialization in all areas
 - Typically, a fullstack developer specializes in one or two languages, but can still work with other languages

Working with teams

- This is vital
 - Web developers work with many other web developers these days, this is normal
 - Being able to write code you and your team can access and work on together is absolutely vital
 - In order to break into web development, you’ll need to know how to work with other people
- Git
 - Is a version control and collaboration tool developers use to share code
 - We tend to “dump” our code into a git-based service, like Github.com, where other developers can download the code, and make updates
 - Github.com and GitLab.com are the two leading “Git” websites
 - Is a vital part of web development
 - Its importance is often undervalued but rest assured, you’ll be using it with every team you work with
 - How it works
 - You can code some work for an hour and “save your progress” in a “commit” and save it on github.com
 - If tomorrow you realised you made a really bad mistake, or accidentally deleted all your code, you have a backup!
 - This is called distributed software
 - Other people can pick up where you left off too

What is open source?

- Open-source code is code that people have written that they give away for free, or at least let you see what the source code is
- Like with backend code on a website, you cannot see what the developers have written
- But if it’s on github.com, called a “repo” (short for repository of code), then you can see what they’re up to
- It’s important
 - Most employers like seeing that you can use git and GitHub
 - You’ll get bonus points for open-source contributions – meaning you wrote some code that went into someone else’s open-source project
- It’s everywhere
 - Believe it or not, most interactions you’ve had on the internet are because of open-source code

- The internet is a free and open place where you can create anything and share it with anybody
- And web developers are often the people who make the “sharing” possible

Don't reinvent the wheel, leverage open source!

- Look for open-source solutions first
 - If you want to add a big feature to your future website, look for open-source solutions first
 - There's no reason you need to duplicate the effort that someone else has already put in
 - Use their work first if it fits your needs!
 - That's why they open sourced their work in the first place