Intro to Web Development With Python

Learning Objectives:

After this lesson, you will be able to:

- Describe how the web works.
- Explain what we mean by front-end and back-end.
- List the types of web developers.

Discussion: What's the Web?

How do you think the web works?

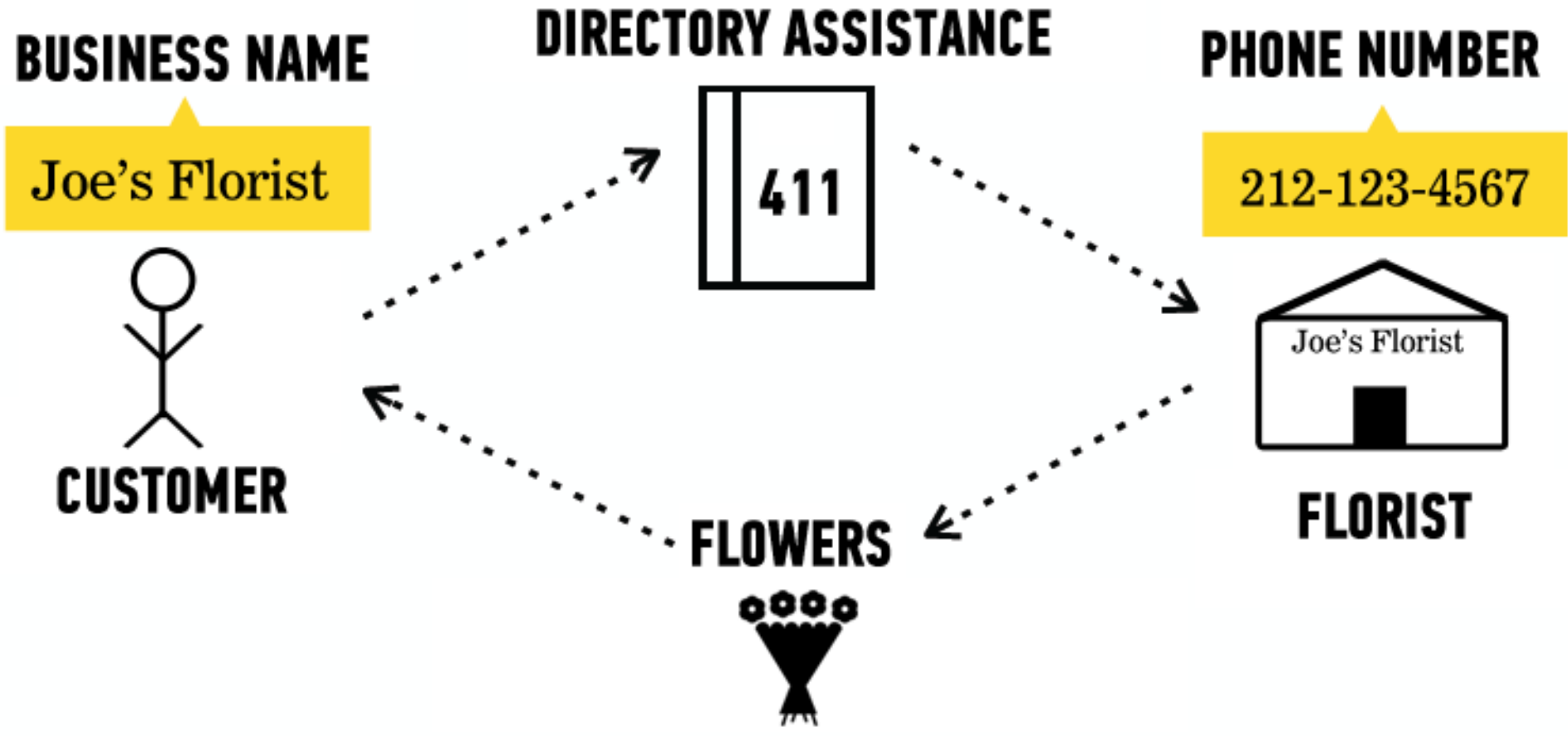
Before we go about making a web app, let's start with how the web works at all.

Finding a Florist

- How does a browser know what page to display?

Also known as:

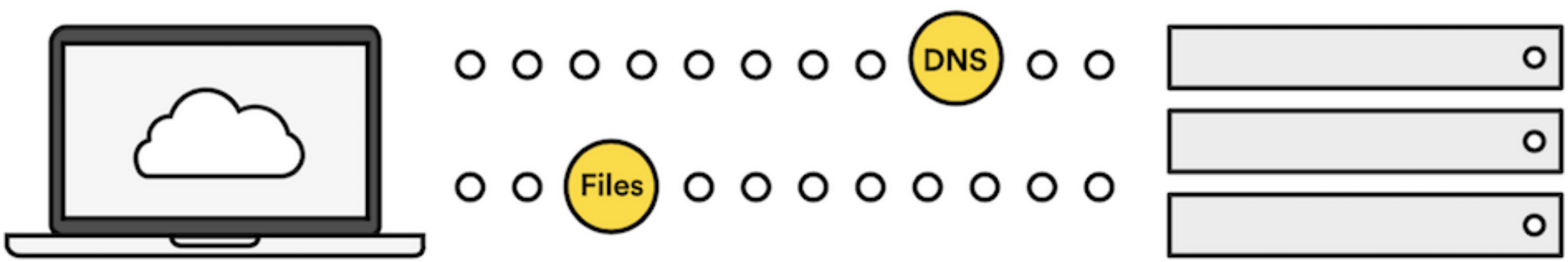
- How do I call my florist? I can just call “Joe’s Florist” in my phone contacts.



IP Addresses

- Website URLs — “Joe’s Florist”
  - Just names to make our lives easier.
  - `https://google.com`
  - `https://reddit.com`
- IP addresses — “515-115-5156”
  - The actual address to which your browser goes.
  - `Google.com` is at `172.217.12.142`.
  - `reddit.com` is at `151.101.129.140`.

Client-Server Relationship Review



Client

—

The browser on your computer is the client that makes requests to view websites.

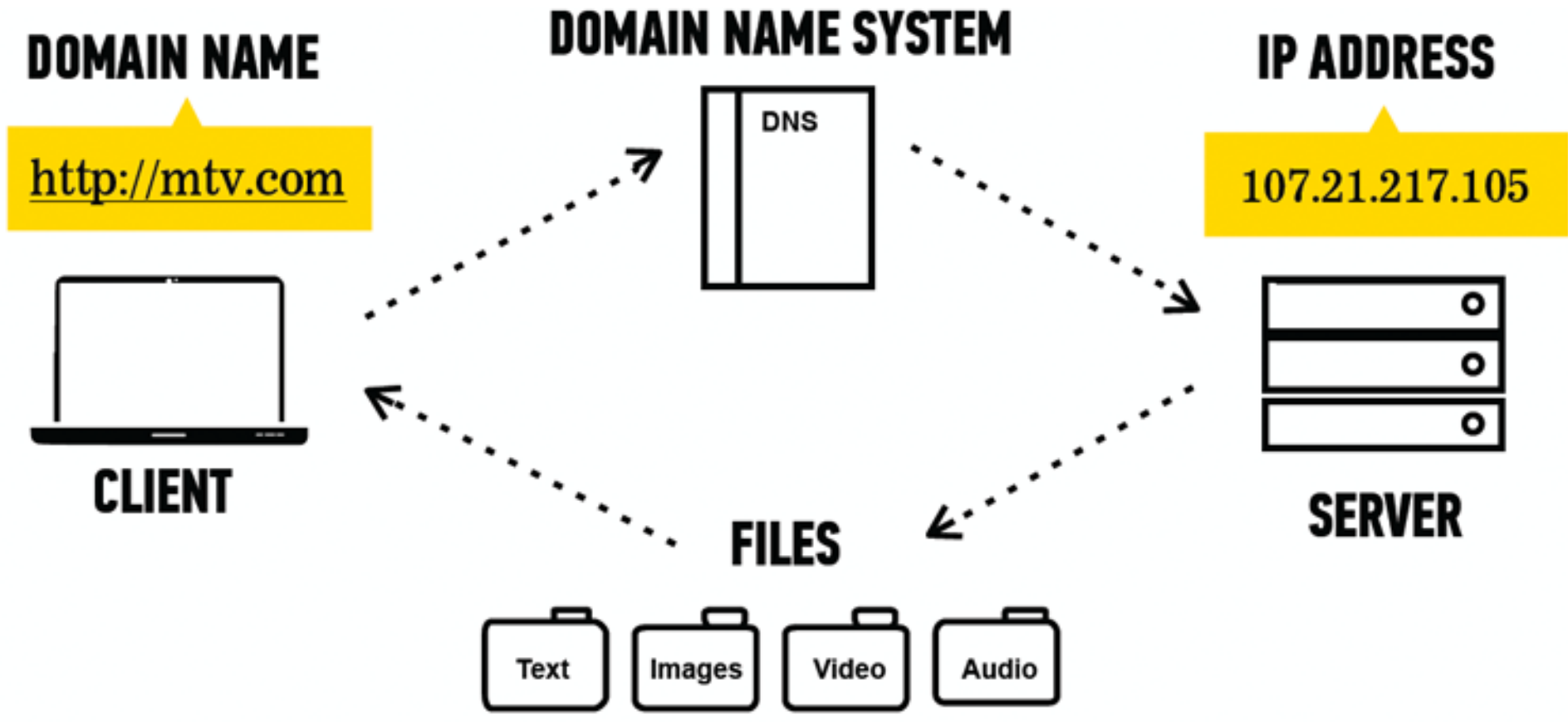
Server

—

Then, a special computer that holds website files called **the server** responds by sending the corresponding files back to the client.

In Real Terms

- Websites are just files your browser can read.



What Types of Files?

HTML (`.html`)

- Provides website structure.

CSS (`.css`)

- Adds colors and fonts.

JavaScript (`.js`)

- Makes the website interactive.

Images, text files, etc.

- Displays additional info on the webpage.

Quick Review

Where do websites exist?

- IP address: The actual location of a website on the internet.
- `Google.com` is a friendly name for the IP address `172.217.12.142`, just like “Joe’s Florist” is a friendly name for the phone number “(515) 115-5156.”

How does a website work?

- Websites are actually just a bunch of files — images, text, and website-specific code.
- They’re hosted on servers — all the files for Google.com live on Google’s servers.
- Your browser is the client: It asks Google for the Google.com files so it can show them to you.

Discussion: What Is Web Development?

Does anyone want to guess (or know) what web development comprises?

Web

The work involved with building and maintaining a live website is split into two sides:

Front-End

- In a restaurant:
  - The dining room.
- In web development:
  - What the user sees.

Back-End

- In a restaurant:
  - The kitchen, loading dock, and offices.
- In web development:
  - What makes the website work (e.g., connects to servers).
  - Behind-the-scenes code.

Front-End vs. Back-End: A Visual

Front-End vs. Back-End: A Better Visual

We Do: Front-End vs. Back-End

Head to the New York Public Library's website: `https://www.nypl.org/`.

- What is the happening on the front-end?
- What is happening on the back-end?

Types of Web Developers:

Front-End Developer

- Languages used: HTML/CSS/JavaScript.
- Works on what the user sees.

Back-End Developer

- Languages used: Python, PHP, Ruby, or many others.
- Works on making the website work.

Full-Stack Developer

- Does both as well as database work!

Quick Recap

Front-end development:

- The visuals.
- How a website looks and how a user interacts with it.

Back-end development:

- The underlying code.
- How the website actually works.

Full-stack development:

- Includes both!

Discussion: What Is a Web Framework?

Does anyone want to guess (or know) what defines a web framework?

Web Framework

Web frameworks are used by both front- and back-end developers to make it easier to develop a website or web app.

- Programming libraries:
  - Are free for your use.
- They make development far easier because they:
  - Provide the client-server relationship piece.
  - Add features to make it easier to write a large web app.
- Frameworks are usually language-specific. Popular examples include:
  - Flask, Django, React.js, Angular.js

Discussion: Web App vs. Website

Does anyone want to guess (or know) the difference?

Web App vs. Website

A website:

- Is typically informational.
- Has little-to-no interactive capabilities.
- e.g., The New York Times or a small company's website.

A web app:

- Is an app hosted on the internet.
- Uses the client-server relationship to render a website.
- Offers the user more features than a static website.
- E.g., a bank's webpage or an auction site.

You can have a hybrid!

- For example, a website can be static until the user logs in.
- Then, it's a full-fledged web app.

Web Development Is Hard

- Don’t worry!
- GA has several classes dedicated to it (e.g., part-time Front-End Web Development or JavaScript Development, or the full-time Web Development Immersive).
- There’s a lot of information out there!

Right now, we’re going to be building web apps with Python!

Summary

What'd we do?

- DNS
  - The actual address of a website.
- The Client-Server Relationship
  - Server sends website files to the client (your browser).
- Front-End vs. Back-End
  - What the user sees versus what makes the website work.

Additional Resources

- Fundamentals of Web Programming
- Understanding the Difference Between Client-Server and Peer-to-Peer Networks
- Web Applications and the HTTP Protocol
- Client-Server