



Web Dev

What REALLY is a website? How does it work?



01

APP DESIGN

Let's make an app...

...but what's an app?

So what's an "app"?

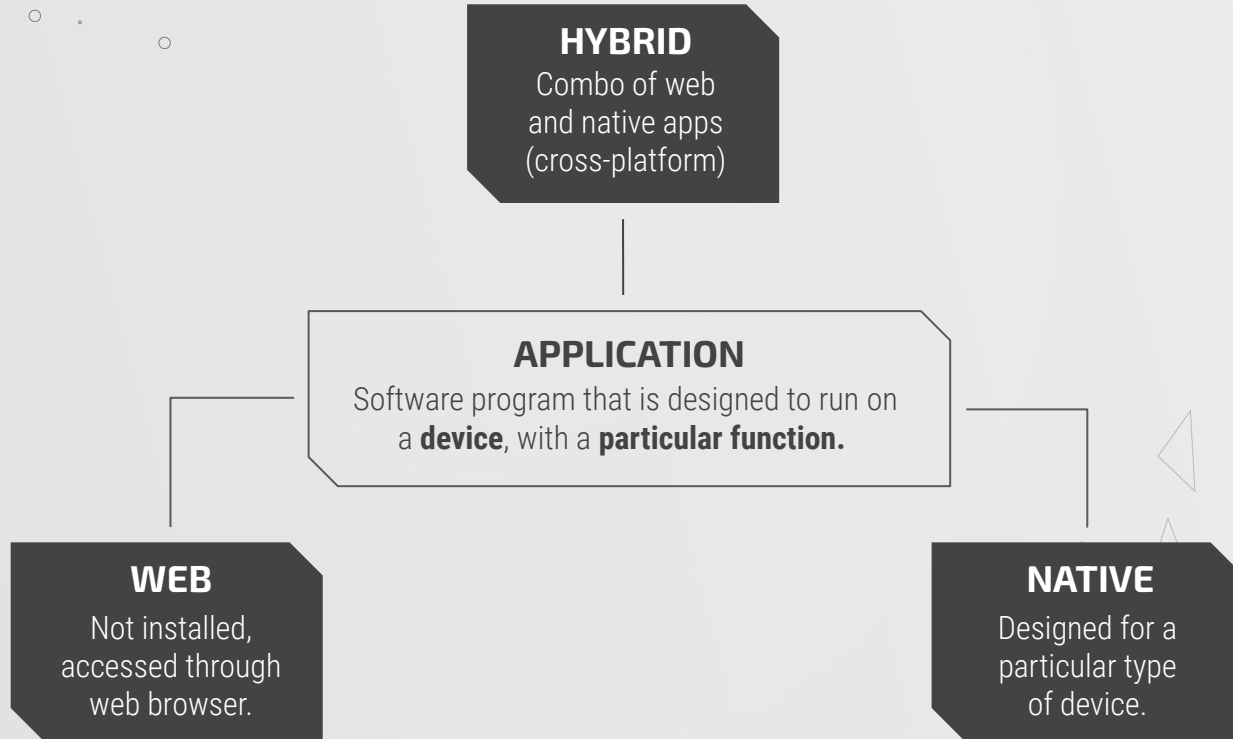
I asked ChatGPT to "define an app in 6 words"...



"A magical portal for procrastination"



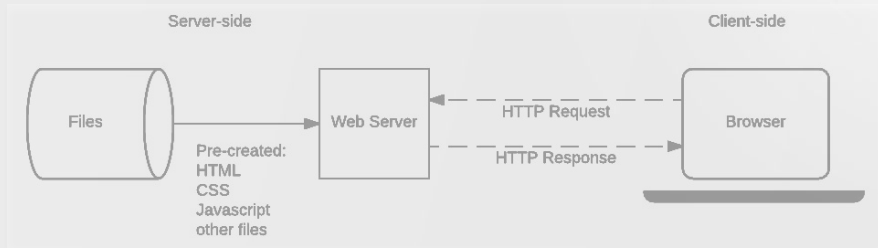
BASIC TYPES OF APPS



CLIENT-SERVER ARCHITECTURE

Put simply: **Clients** (frontend) request **servers** (backend) for services.

What are some examples of services that a client might request?





CLIENT-SERVER ARCHITECTURE

What do you think would be the main advantages and disadvantages of this setup?
(Today's Canvas Quiz!!!)





02

BACKEND DEV

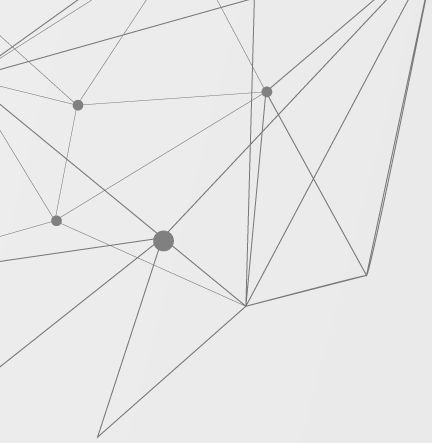
"Ok, thanks for the info. How does that help?"



What Do Servers Do?

- Can host files
 - AKA a server can save files on it (just like your computer)
- Send data/HTML/files to clients
 - Interface with databases (**C**reate, **R**ead, **U**ppdate, **D**eleate)
 - Interact with other APIs
- Can store user states (i.e. logged in, etc)






How Do Servers Send Data?

- Idea of a HTTP (**H**yper**T**ext **T**ransfer **P**rotocol) request
 - Requests have statuses and data
- Server receives a request, processes it, and sends a response
 - Response also has a status and data!





How Do I “Create” A Server?

- You can create a server simply by running a program on your laptop!
 - I.e. Just a program running on a CPU (no monitor or keyboard required)
 - Most popular by far is Node.JS
 - Other flavors include Flask/Django (Python), Apache Tomcat (Java), etc.
- 



03

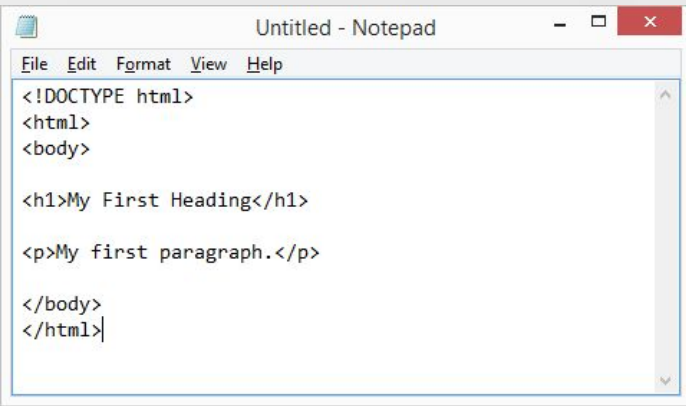
FRONTEND DEV

But how do I make a website?

How Webpages Are Made

HTML, CSS, and JavaScript

- We use HTML for the actual content on the webpage.
- We use CSS to style the content on our page.
- We use JS to make our webpage dynamic!

A screenshot of a Notepad window titled "Untitled - Notepad". The window has a menu bar with "File", "Edit", "Format", "View", and "Help". The text area contains the following HTML code:

```
<!DOCTYPE html>
<html>
<body>

<h1>My First Heading</h1>

<p>My first paragraph.</p>

</body>
</html>
```



What is a Library?

A bunch of pre-written code, that makes our lives a lot easier.

Notable Examples:

- React
- Angular
- Vue
- Flutter

Each of these also have component libraries/styling tools. In the case of React:

- Material UI
- Chakra UI

These are useful when it comes to finding what you want!



HTML vs. Libraries

```
<div class="hero-bottom-svg d-md-block d-lg-block d-none">
<svg xmlns="http://www.w3.org/2000/svg" width="201" height="201" viewBox="0 0 201 201">
  <g id="Group_1168" data-name="Group 1168" transform="translate(-384 -1392)">
    <rect id="Rectangle_2206" data-name="Rectangle 2206" width="12" height="2" rx="1"
      transform="translate(391 1392) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2271" data-name="Rectangle 2271" width="12" height="2" rx="1"
      transform="translate(391 1500) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2238" data-name="Rectangle 2238" width="12" height="2" rx="1"
      transform="translate(391 1446) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2278" data-name="Rectangle 2278" width="12" height="2" rx="1"
      transform="translate(391 1554) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2222" data-name="Rectangle 2222" width="12" height="2" rx="1"
      transform="translate(391 1419) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2272" data-name="Rectangle 2272" width="12" height="2" rx="1"
      transform="translate(391 1527) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2241" data-name="Rectangle 2241" width="12" height="2" rx="1"
      transform="translate(391 1473) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2288" data-name="Rectangle 2288" width="12" height="2" rx="1"
      transform="translate(391 1581) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2214" data-name="Rectangle 2214" width="12" height="2" rx="1"
      transform="translate(499 1392) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2289" data-name="Rectangle 2289" width="12" height="2" rx="1"
      transform="translate(499 1500) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2256" data-name="Rectangle 2256" width="12" height="2" rx="1"
      transform="translate(499 1446) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2290" data-name="Rectangle 2290" width="12" height="2" rx="1"
      transform="translate(499 1554) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2231" data-name="Rectangle 2231" width="12" height="2" rx="1"
      transform="translate(499 1419) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2291" data-name="Rectangle 2291" width="12" height="2" rx="1"
      transform="translate(499 1527) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2257" data-name="Rectangle 2257" width="12" height="2" rx="1"
      transform="translate(499 1473) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2292" data-name="Rectangle 2292" width="12" height="2" rx="1"
      transform="translate(499 1581) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2210" data-name="Rectangle 2210" width="12" height="2" rx="1"
      transform="translate(445 1392) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2279" data-name="Rectangle 2279" width="12" height="2" rx="1"
      transform="translate(445 1500) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2248" data-name="Rectangle 2248" width="12" height="2" rx="1"
      transform="translate(445 1446) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2280" data-name="Rectangle 2280" width="12" height="2" rx="1"
      transform="translate(445 1554) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2226" data-name="Rectangle 2226" width="12" height="2" rx="1"
      transform="translate(445 1419) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2281" data-name="Rectangle 2281" width="12" height="2" rx="1"
      transform="translate(445 1527) rotate(90)" fill="#282f49" />
    <rect id="Rectangle_2249" data-name="Rectangle 2249" width="12" height="2" rx="1"
      transform="translate(445 1473) rotate(90)" fill="#282f49" />
```

```
<Grid container spacing={2}>
  <Grid item xs={8}>
    <Item>xs=8</Item>
  </Grid>
  <Grid item xs={4}>
    <Item>xs=4</Item>
  </Grid>
  <Grid item xs={4}>
    <Item>xs=4</Item>
  </Grid>
  <Grid item xs={8}>
    <Item>xs=8</Item>
  </Grid>
</Grid>
```



CLIENT- VS SERVER- SIDE RENDERING

AKA, how much work is done on your server vs the user's browser?

The server just sends the client the code to generate the server, and the client's browser does the rendering locally.

CLIENT-SIDE

ALL the HTML is generated at the server, and then sent over to the client's browser.

SERVER-SIDE

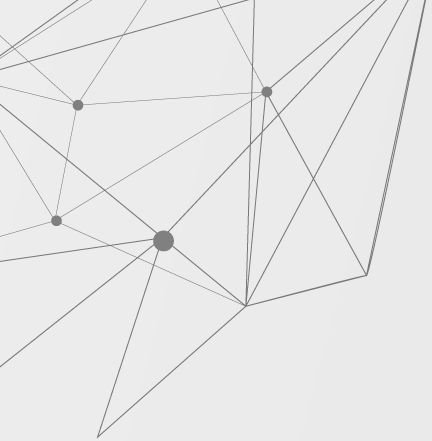




04

POTPOURRI

What utilities, tools, and ideas might be relevant?



JSX

A combination of JavaScript and HTML!

HTML tags can be variables, and we can substitute in other variables into these tags.

```
function formatName(user) {  
  return user.firstName + ' ' + user.lastName;  
}  
  
const user = {  
  firstName: 'Harper',  
  lastName: 'Perez'  
};  
  
const element = (  
  <h1>  
    Hello, {formatName(user)}!  
  </h1>  
);
```





TYPESCRIPT!

A typed version of Javascript, which ensures that you can give variables types (very useful when you want to ensure that a variable can only be one type!)

```
// Anonymous function
let myAdd = function (x: number, y: number) : number {
  return x + y;
};
// Anonymous function call
console.log(myAdd(5,3));
```





PACKAGE MANAGERS

Useful to keep track of libraries that you've installed, and have a centralized way of installing them.

Most common ones: NPM and Yarn

The npm logo, consisting of the lowercase letters 'npm' in a bold, black, sans-serif font.

 Search packages

Search

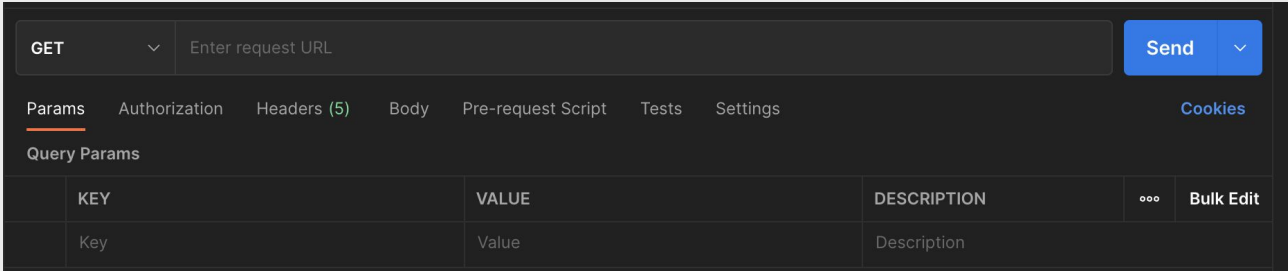




REQUEST “SIMULATORS”

Useful to simulate backend requests, that would be made to a server.

Most common ones: Postman and CURL (command)

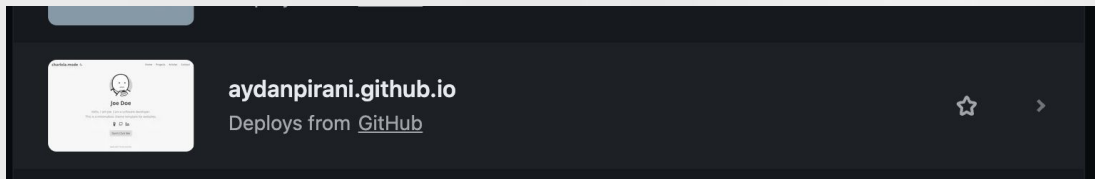




HOSTING SERVICES

Options to host your server for you. Includes features like better reliability, CDNs, domain registration, etc

Best beginner-friendly options: Vercel, Heroku, Github Pages





THANKS!

Any questions?

Feel free to hang around after class or email us!

