

PICTURE



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A British humanoid named AiDa has made history by becoming the first robot to speak at the House of Lords but suffered a slight hiccup after falling asleep
[#humanoid](#) [#AiDa](#) [#history](#) [#robot](#) [#House](#) [#Lords](#)



12:57 PM · Oct 11, 2022





Ai-Da's rendering of Thomas Bodely and Ada Lovelace

We appreciate your
presence!

WHAT'S CICSOFT?

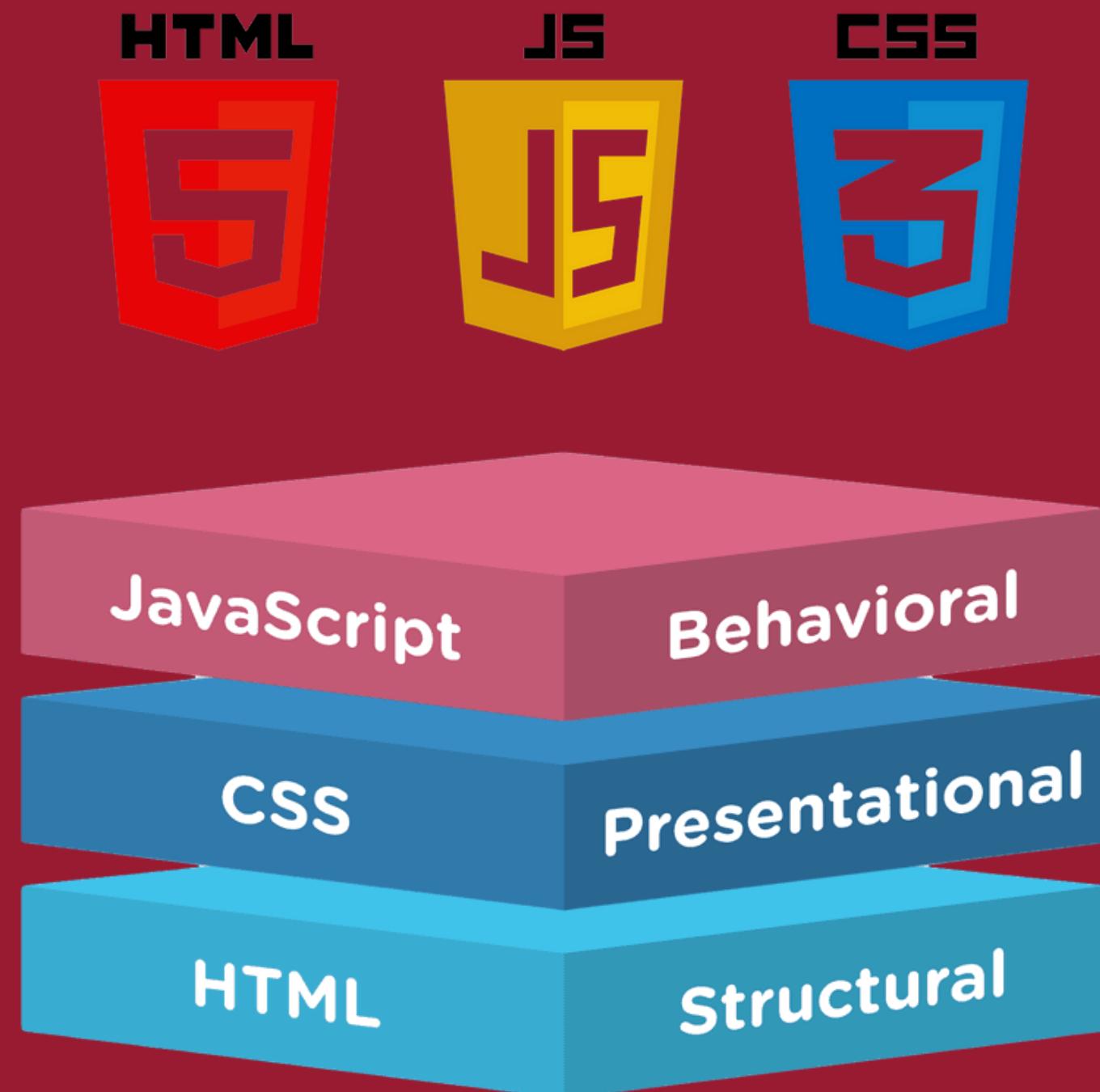
- Interest-oriented CICS organization
- Environment to enhance their technical skills
- Members learn developing applications

WHY?

Our aim is to empower students by delivering the means to build incredible apps and realize their ideas through code.

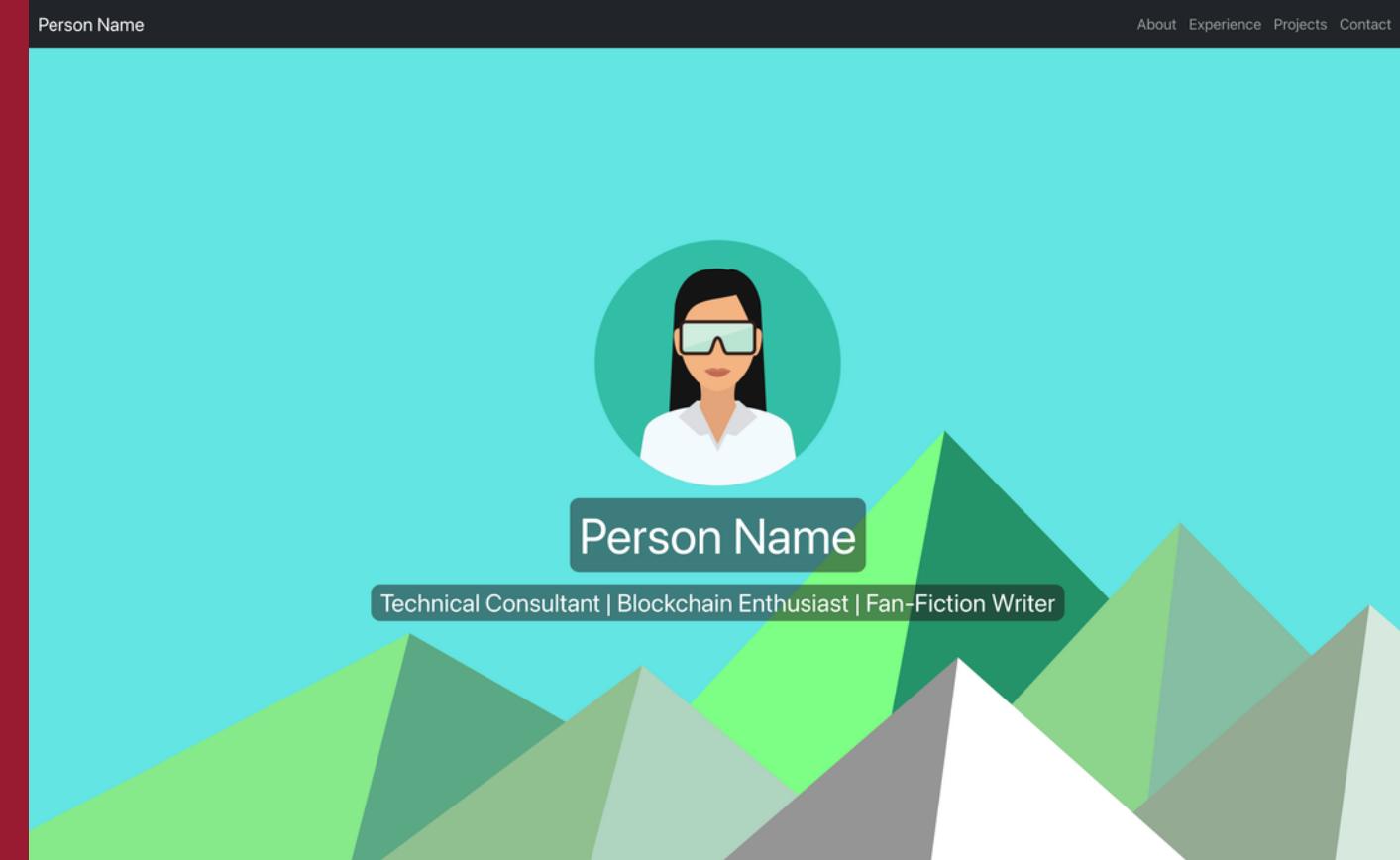
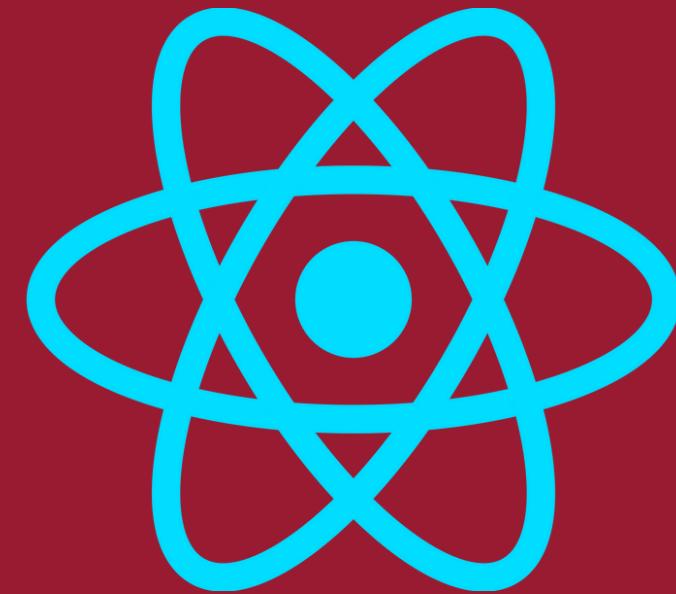
LAST TIME

- More CSS:
 - Apply styles to websites
- JavaScript for the Web:
 - Add logic for websites
- "HTML/CSS/JS":
 - Build interactive websites

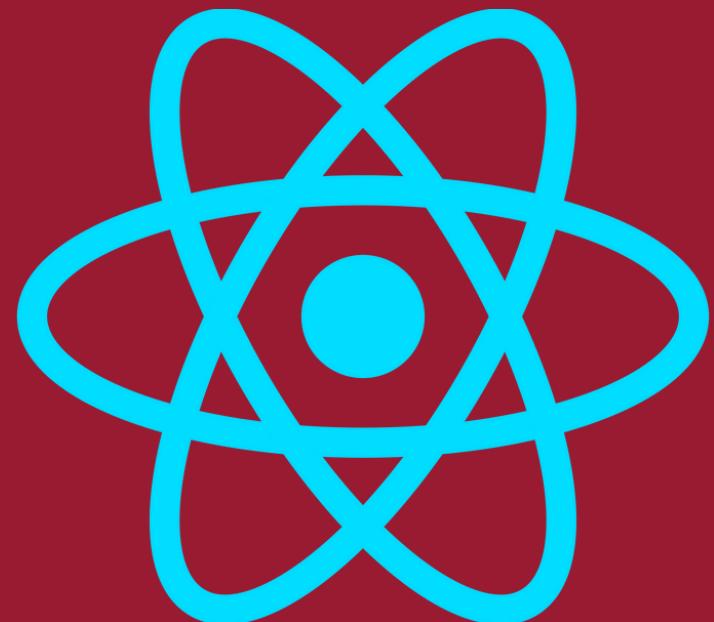


THIS TIME

- React:
 - Why?
 - File Structure
 - Components
- Portfolio Website
 - Create-React-App
 - Build navigation bar
 - Design profile page



WHAT IS REACT?



- JavaScript library for building user interfaces
- Declarative: Tell what to do, not how to do
- Efficient: Don't rewrite code, reuse it
- Flexible: Use what you want, lots of packages
- Build UIs using “components” - small and isolated pieces of code

SET UP FOR REACT



- Download and install Node
 - LTS version 18.12.0

```
CICSoft-Fall-22-Sessions on ↵ main
● → node -v
v18.12.0

CICSoft-Fall-22-Sessions on ↵ main
● → npm -v
8.19.2
```

- Verify by running terminal:
 - node -v
 - npm -v

CREATE-REACT-APP

- Easiest way to create a React app
- Great for Single-Page Applications
 - apps that show only one page (.html) which is dynamically modified to show different content
- Client-Side Rendering
 - changes to UI are computed on client devices

~/Documents/@CICSoft
◦ → npx create-react-app session-4

```
Creating a new React app in /Users/avs/Documents/@CICSoft/session-4.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts with cra-template...

added 1393 packages in 32s
212 packages are looking for funding
  run `npm fund` for details
Initialized a git repository.

Installing template dependencies using npm...
added 71 packages in 6s
224 packages are looking for funding
  run `npm fund` for details
Removing template package using npm...

removed 1 package, and audited 1464 packages in 3s
224 packages are looking for funding
  run `npm fund` for details
6 high severity vulnerabilities

To address all issues (including breaking changes), run:
  npm audit fix --force
Run `npm audit` for details.

Created git commit.

Success! Created session-4 at /Users/avs/Documents/@CICSoft/session-4
Inside that directory, you can run several commands:

  npm start
    Starts the development server.

  npm run build
    Bundles the app into static files for production.

  npm test
    Starts the test runner.

  npm run eject
    Removes this tool and copies build dependencies, configuration files
    and scripts into the app directory. If you do this, you can't go back!

We suggest that you begin by typing:

  cd session-4
  npm start

Happy hacking!
```

FILE STRUCTURE

```
1 session-4
2   └── README.md
3   └── node_modules
4   └── package.json
5   └── .gitignore
6   └── public
7     └── favicon.ico
8     └── index.html
9     └── logo192.png
10    └── logo512.png
11    └── manifest.json
12    └── robots.txt
13
14   └── src
15     └── App.css
16     └── App.js
17     └── App.test.js
18     └── index.css
19     └── index.js
20     └── logo.svg
21     └── serviceWorker.js
22     └── setupTests.js
```

- **README.md:** Documentation about Create-React-App
- **node_modules:** Directory containing all the packages you use, along with ones needed to run the application
- **package.json:** Configuration file describing which packages are needed and contains app metadata
- **package-lock.json:** "Lockfile" describing dependencies of packages used and generated on 'npm install'
- **.gitignore:** Configuration file to tell git to ignore bulky, unnecessary, or private files

FILE STRUCTURE (PUBLIC)

```
● ● ●  
1 session-4  
2   └── README.md  
3   └── node_modules  
4   └── package.json  
5   └── .gitignore  
6   └── public  
7     └── favicon.ico  
8     └── index.html  
9     └── logo192.png  
10    └── logo512.png  
11    └── manifest.json  
12    └── robots.txt  
13  
14   └── src  
15     └── App.css  
16     └── App.js  
17     └── App.test.js  
18     └── index.css  
19     └── index.js  
20     └── logo.svg  
21     └── serviceWorker.js  
22     └── setupTests.js
```

- **index.html:** HTML page template in which React dynamically renders the content (i.e. the single page in a SPA)
- **.png, .ico:** Image and icon assets to be displayed through the template page
- **manifest.json:** Configuration file describing the metadata for the assets and index.html
- **robots.txt:** Configuration file to inform search engine crawlers to index/not index certain parts of app

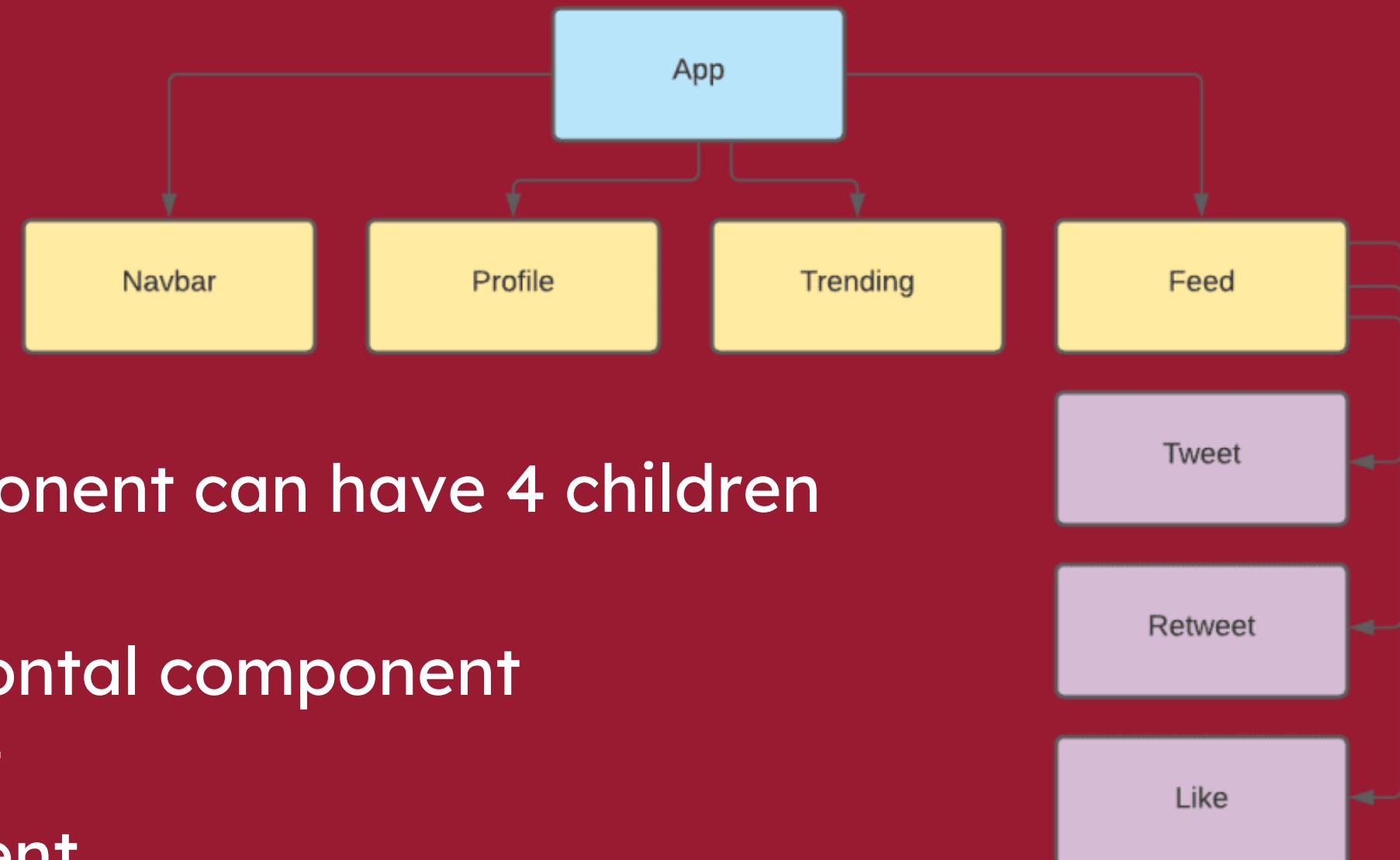
FILE STRUCTURE (SRC)

```
● ● ●  
1 session-4  
2   └── README.md  
3   └── node_modules  
4   └── package.json  
5   └── .gitignore  
6   └── public  
7     └── favicon.ico  
8     └── index.html  
9     └── logo192.png  
10    └── logo512.png  
11    └── manifest.json  
12    └── robots.txt  
13  
14   └── src  
15     └── App.css  
16     └── App.js  
17     └── App.test.js  
18     └── index.css  
19     └── index.js  
20     └── logo.svg  
21     └── serviceWorker.js  
22     └── setupTests.js
```

- `index.js`: JavaScript entrypoint for React to inject dynamic content into the HTML template in `public/`
- `App.js`: The main "component" of a React app, containing all the data that is dynamically displayed
- `.css` files: Stylesheets for the index (applies to whole HTML template) and App component specifically
- `.svg` file: "Lockfile" describing dependencies of packages used and generated on 'npm install'
- Remaining files are used for testing and observing performance metrics

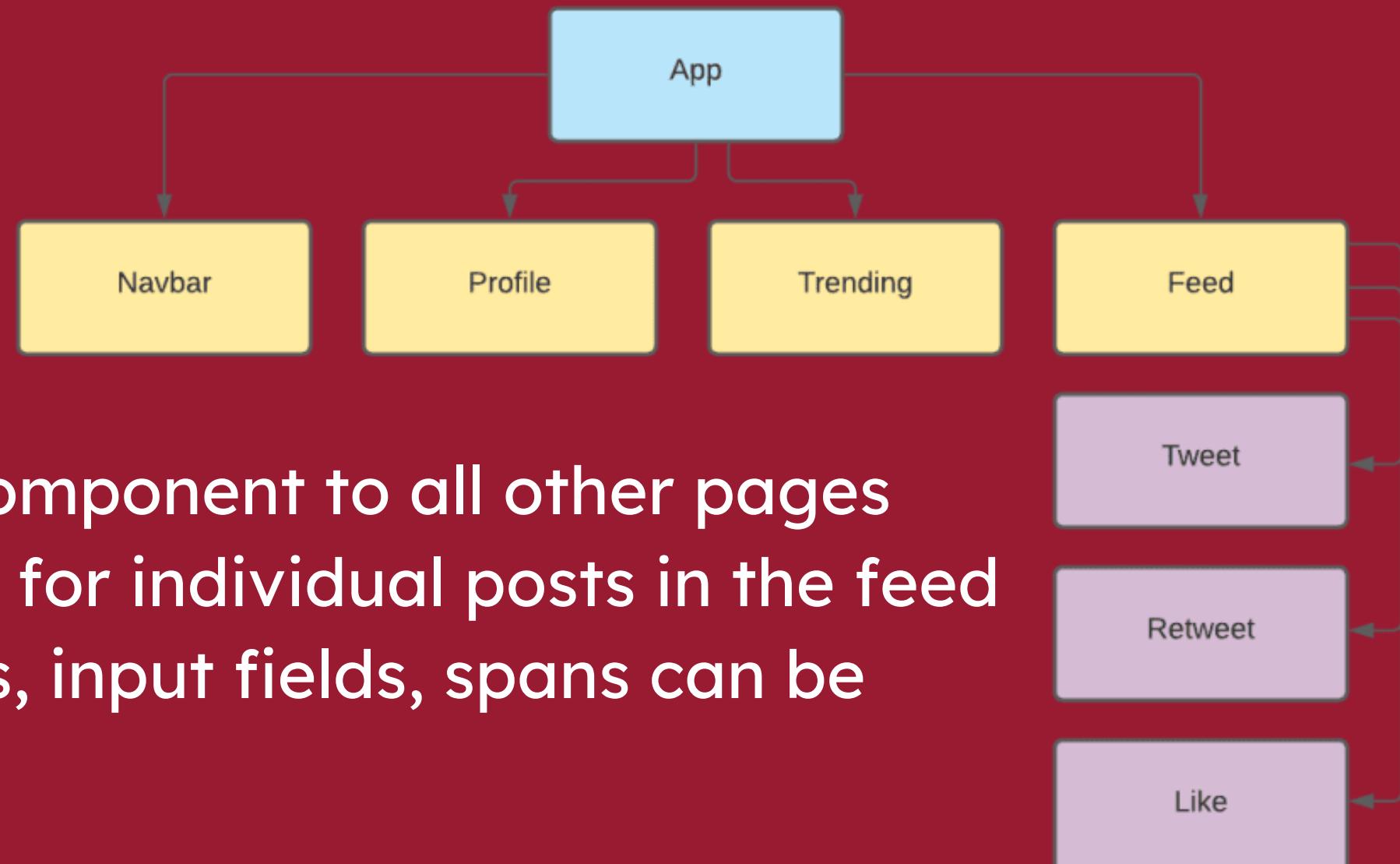
COMPONENTS

- React uses "Component"s as its building blocks
- Each component can be reused multiple times without rewriting huge blocks of code
- For example, the main App component can have 4 children components:
 - Navigation Bar - simple horizontal component
 - Profile - page/tab component
 - Trending - page/tab component
 - Feed - list of posts component



COMPONENTS

- Navigation bar will have to appear in other components as well
- No need to rewrite the internal code again
- Just add the `<NavigationBar/>` component to all other pages
- Similarly, no need to rewrite code for individual posts in the feed
- Common components like buttons, input fields, spans can be customized as used directly



PORTFOLIO WEBSITE

Person Name

About Experience Projects Contact

Person Name

Technical Consultant | Blockchain Enthusiast | Fan-Fiction Writer

The website features a dark teal background with a large, stylized graphic of overlapping green and grey triangles at the bottom. A circular profile picture of a woman wearing VR goggles is centered above the name. The navigation bar is black with white text, and the overall design is clean and modern.

COMPLETE CODE

```
○ → git clone https://github.com/umass-cicsoft/CICSoft-Fall-22-Sessions
```

```
~/Documents/@CICSoft
```

```
● → cd CICSoft-Fall-22-Sessions
```

```
CICSoft-Fall-22-Sessions on ✘ main
```

```
● → cd Session\ 4
```

```
CICSoft-Fall-22-Sessions/Session 4 on ✘ main
```

```
● → cd portfolio-website-1
```

```
CICSoft-Fall-22-Sessions/Session 4/portfolio-website-1 on ✘ main is 📦 v0.1.0 via ◆ v18.12.0
```

```
● → npm install
```

```
up to date, audited 1414 packages in 3s
```

```
226 packages are looking for funding  
  run `npm fund` for details
```

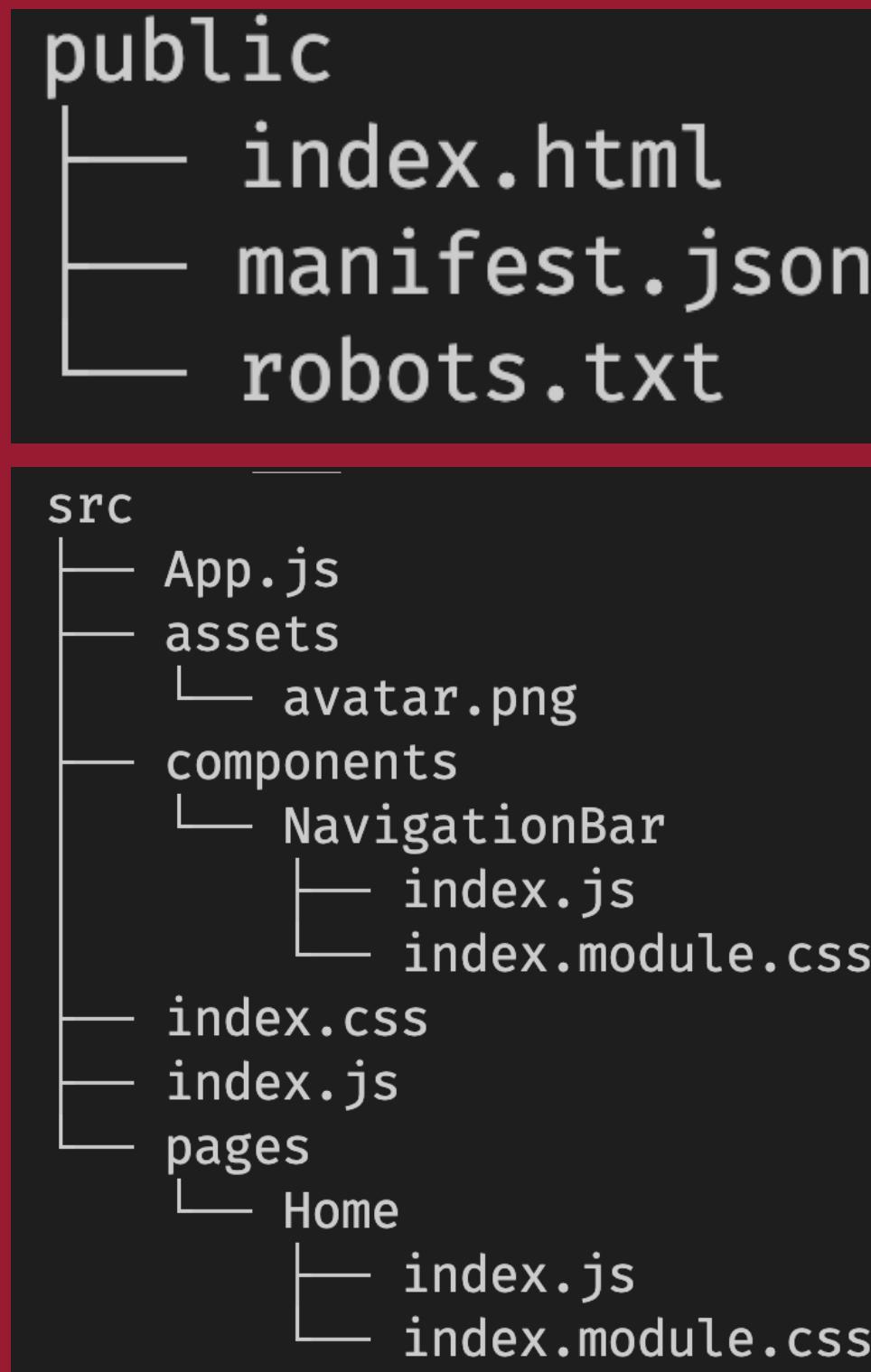
```
6 high severity vulnerabilities
```

```
To address all issues (including breaking changes), run:
```

```
  npm audit fix --force
```

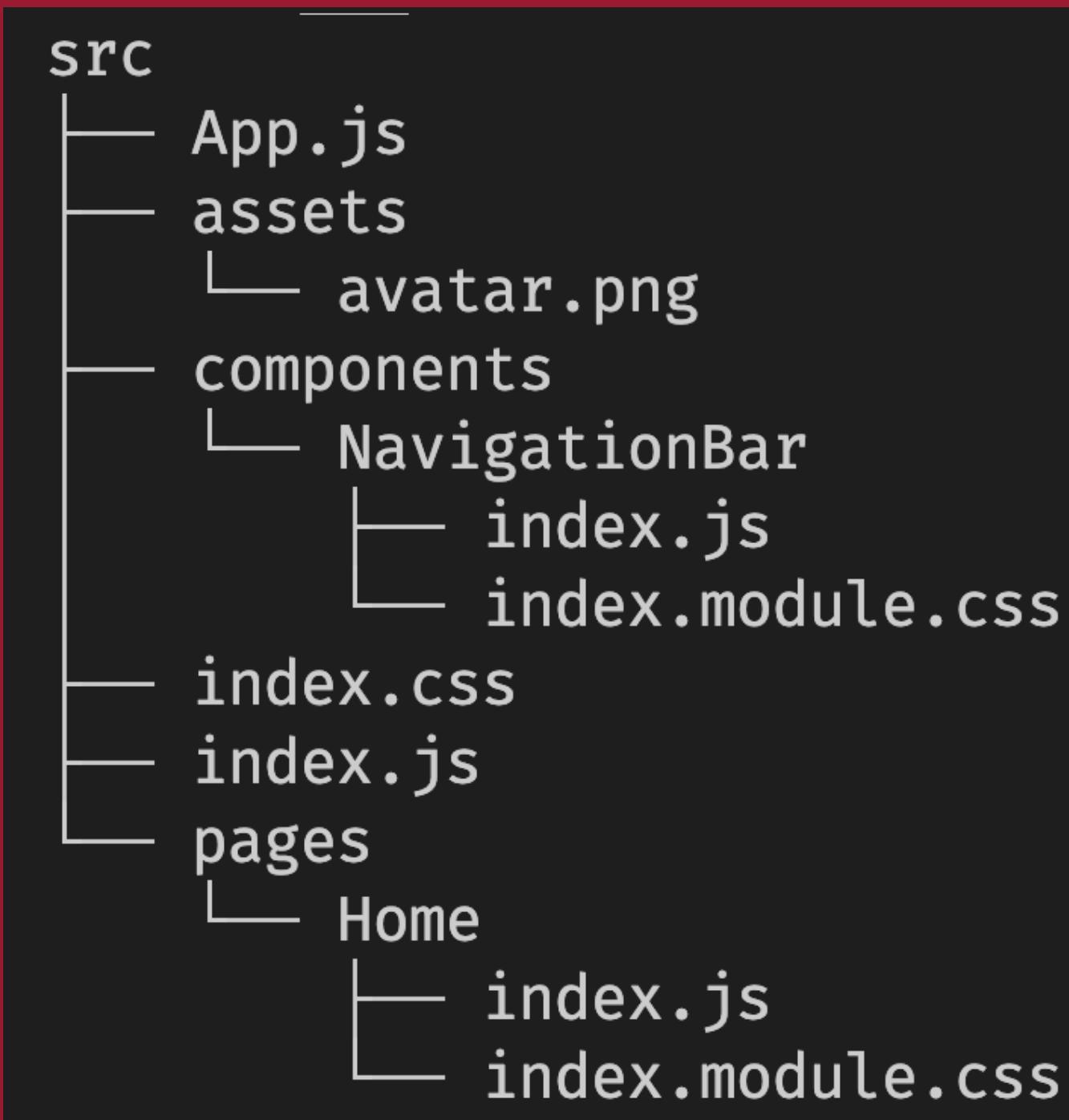
```
Run `npm audit` for details.
```

FILE STRUCTURE



- 'public' directory: deleted image and icon assets, remainder unmodified
- 'src' directory: deleted unnecessary testing files and added/modified files for the portfolio website
- other files: unchanged, with two new packages installed
 - react-bootstrap: Great UI library for easy-to-use template components
 - bootstrap: Underlying CSS framework for react-bootstrap, widely used with HTML/CSS

FILE STRUCTURE



- 'assets' directory: Contains image asset for profile picture
- 'components' directory: Contains a NavigationBar component (index.js) with associated styles using Modular CSS (index.module.css)
- 'pages' directory: Contains a Home page component (index.js) with associated styles using Modular CSS (index.module.css)

FILE STRUCTURE

```
src
  ├── App.js
  └── assets
      └── avatar.png
  ├── components
      └── NavigationBar
          ├── index.js
          └── index.module.css
  ├── index.css
  ├── index.js
  └── pages
      └── Home
          ├── index.js
          └── index.module.css
```

- **index.js:** Still the entrypoint for JavaScript
- **App.js:** Modified to have NavigationBar component and Home page
- **index.css:** Modified to import a Google font
- **App.css:** Deleted, not using any existing styles

INDEX.JS

```
● ● ●

1 import React from 'react';
2 import ReactDOM from 'react-dom/client';
3
4 import './index.css';
5 import 'bootstrap/dist/css/bootstrap.min.css';
6
7 import App from './App';
8
9 const root = ReactDOM.createRoot(document.getElementById('root'));
10 root.render(
11   <React.StrictMode>
12     <App />
13   </React.StrictMode>
14 );
```

INDEX.CSS

```
● ● ●  
1 @import url('https://fonts.googleapis.com/css2?family=Ubuntu&display=swap');  
2  
3 body {  
4   margin: 0;  
5   font-family: 'Ubuntu', sans-serif;  
6   -webkit-font-smoothing: antialiased;  
7   -moz-osx-font-smoothing: grayscale;  
8 }  
9  
10 code {  
11   font-family: source-code-pro, Menlo, Monaco, Consolas, 'Courier New',  
12     monospace;  
13 }  
14
```

APP.JS

```
● ● ●  
1 import React from 'react';  
2 import NavigationBar from './components/NavigationBar';  
3 import Home from './pages/Home';  
4  
5 const App = () => {  
6   return (  
7     <React.Fragment>  
8       <NavigationBar />  
9       <Home />  
10      </React.Fragment>  
11    );  
12  }  
13  
14 export default App;  
15
```

NAVIGATION BAR - INDEX

```
● ● ●  
1 import React from 'react';  
2 import { Container, Nav, Navbar } from 'react-bootstrap';  
3  
4 import styles from './index.module.css';  
5  
6 const NavigationBar = () => {  
7     return (  
8         <Navbar bg='dark' variant='dark' fixed='top' expand='lg'>  
9             <Container fluid>  
10                <Navbar.Brand className={styles.personName}>Person Name</Navbar.Brand>  
11                <Navbar.Toggle aria-controls='portfolio-navbar-nav' />  
12                <Navbar.Collapse id='portfolio-navbar-nav'>  
13                    <Nav className='ms-auto'>  
14                        <Nav.Link href="#about"><span className={styles.navLinkSpan}>About</span></Nav.Link>  
15                        <Nav.Link href="#experience"><span className={styles.navLinkSpan}>Experience</span></Nav.Link>  
16                        <Nav.Link href="#projects"><span className={styles.navLinkSpan}>Projects</span></Nav.Link>  
17                        <Nav.Link href="#contact"><span className={styles.navLinkSpan}>Contact</span></Nav.Link>  
18                    </Nav>  
19                </Navbar.Collapse>  
20            </Container>  
21        </Navbar>  
22    );  
23 };  
24  
25 export default NavigationBar;
```

NAVIGATION BAR - STYLES

```
1 .personName {  
2   font-size: x-large;  
3 }  
4  
5 .navLinkSpan {  
6   font-size: larger;  
7 }
```

Person Name

About Experience Projects Contact

Person Name

Technical Consultant | Blockchain Enthusiast | Fan-Fiction Writer

HOME PAGE - INDEX

```
● ● ●

1 import React from 'react';
2 import { Container, Row } from 'react-bootstrap';
3 import ProfileAvatar from '../..//assets/avatar.png';
4
5 import styles from './index.module.css';
6
7 const Home = () => {
8     return (
9         <Container fluid className={styles.profileContainer}>
10            <Row className={styles.profileRow}>
11                <img className={styles.profileAvatar} src={ProfileAvatar} alt="Profile Avatar" />
12            </Row>
13            <Row className={styles.profileRow}>
14                <span className={styles.profileName}>Person Name</span>
15            </Row>
16            <Row className={styles.profileRow}>
17                <span className={styles.profileDescription}>
18                    Technical Consultant | Blockchain Enthusiast | Fan-Fiction Writer
19                </span>
20            </Row>
21        </Container>
22    )
23 };
24
25 export default Home;
```

HOME PAGE - STYLES

The diagram illustrates the mapping of CSS style rules to a visual representation of a home page profile section. The code block on the left contains 37 lines of CSS, and arrows point from specific lines to corresponding elements on the right.

Elements on the right:

- Person Name (text)
- Profile Avatar (image of a person wearing glasses)
- Person Name (text box)
- Technical Consultant | Blockchain Enthusiast | Fan-Fiction Writer (text box)

Style Rules (Lines 1-37) and their targets:

- Line 1: .profileContainer { (pink arrow to Person Name)
- Line 2: display: flex; (pink arrow to Person Name)
- Line 3: flex-direction: column; (pink arrow to Person Name)
- Line 4: background-color: #62E5E3; (pink arrow to Person Name)
- Line 5: background-attachment: fixed; (pink arrow to Person Name)
- Line 6: background-size: cover; (pink arrow to Person Name)
- Line 7: height: 100vh; (pink arrow to Person Name)
- Line 8: width: 100vw; (pink arrow to Person Name)
- Line 9: justify-content: center; (pink arrow to Person Name)
- Line 10: align-items: center; (pink arrow to Person Name)
- Line 13: .profileRow { (blue arrow to Profile Avatar)
- Line 14: display: flex; (blue arrow to Profile Avatar)
- Line 15: justify-content: center; (blue arrow to Profile Avatar)
- Line 16: align-items: center; (blue arrow to Profile Avatar)
- Line 17: padding: 0.5rem; (blue arrow to Profile Avatar)
- Line 20: .profileAvatar { (blue arrow to Profile Avatar)
- Line 21: height: 20rem; (blue arrow to Profile Avatar)
- Line 22: width: auto; (blue arrow to Profile Avatar)
- Line 25: .profileName { (blue arrow to Person Name)
- Line 26: font-size: 4rem; (blue arrow to Person Name)
- Line 27: color: white; (blue arrow to Person Name)
- Line 28: background: rgba(20, 20, 20, 0.5); (blue arrow to Person Name)
- Line 29: border-radius: 0.75rem; (blue arrow to Person Name)
- Line 32: .profileDescription { (blue arrow to Person Name)
- Line 33: font-size: 2rem; (blue arrow to Person Name)
- Line 34: color: white; (blue arrow to Person Name)
- Line 35: background: rgba(20, 20, 20, 0.5); (blue arrow to Person Name)
- Line 36: border-radius: 0.75rem; (blue arrow to Person Name)
- Line 37: } (blue arrow to Person Name)

LOGIC? ROUTING?

Person Name

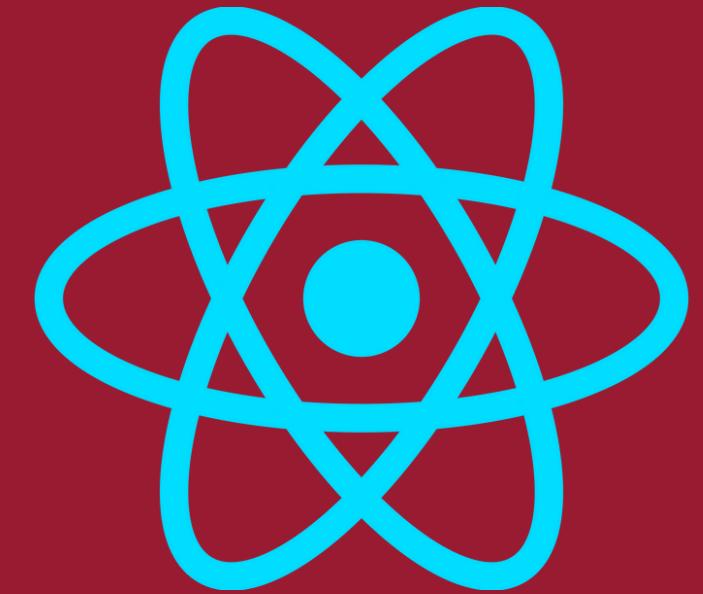
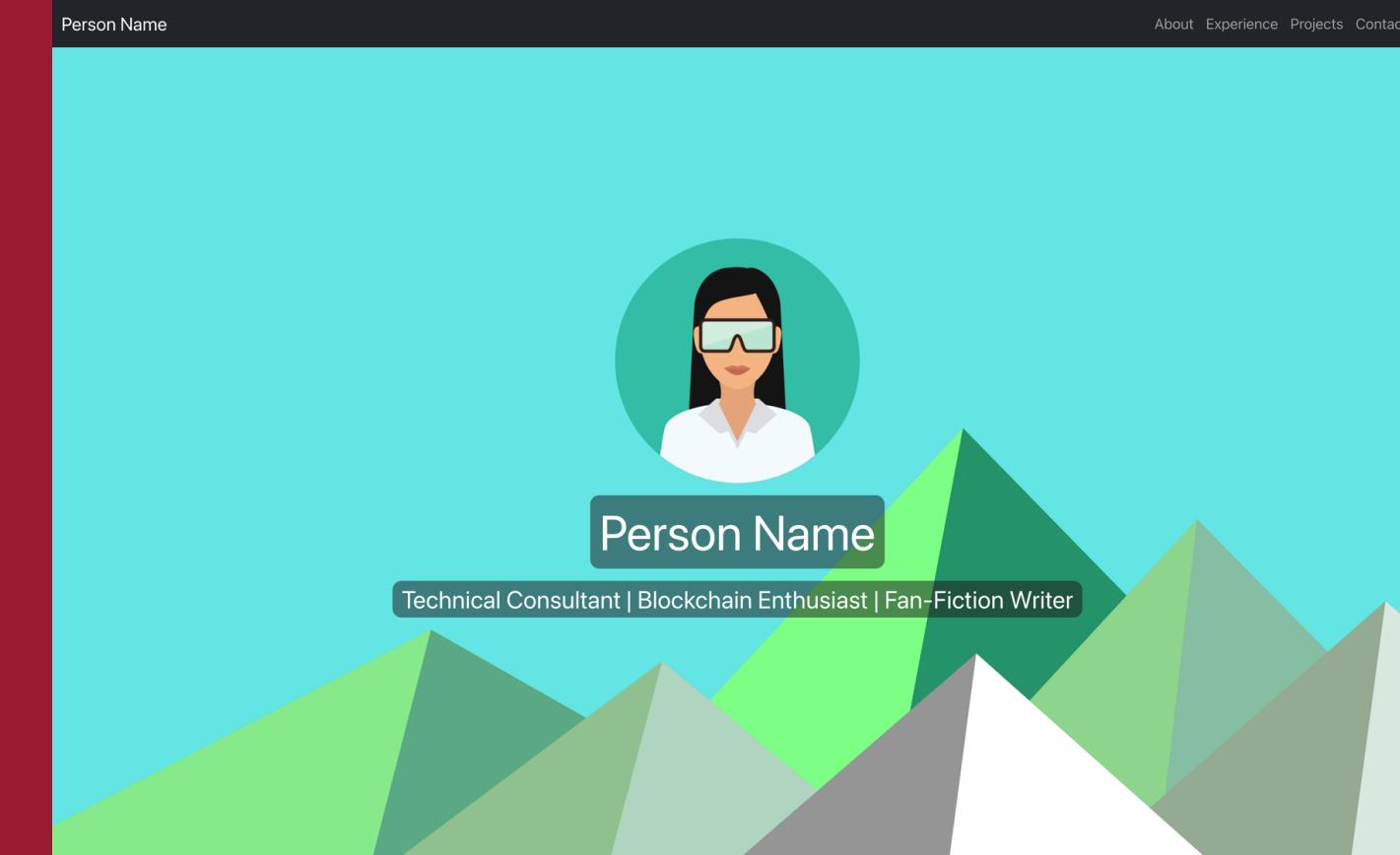
About Experience Projects Contact

Person Name

Technical Consultant | Blockchain Enthusiast | Fan-Fiction Writer

NEXT TIME

- React:
 - Logic
 - Actual JS in JSX?
 - Routing
- Portfolio Website
 - Build navigation logic
 - Design more pages
 - Route between pages





Thank you for joining
us today!