Welcome to the CoGrammar Tutorial: Node.js and React.js

The session will start shortly...

Questions? Drop them in the chat. We'll have dedicated moderators answering questions.

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Full Stack Web Development Session Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

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Full Stack Web Development Session Housekeeping cont.

- For all **non-academic questions**, please submit a query: www.hyperiondev.com/support

- Report a **safeguarding** incident: www.hyperiondev.com/safeguardreporting

- We would love your **feedback** on lectures: [Feedback on Lectures]()

Skills Bootcamp 8-Week Progression Overview

Fulfil 4 Criteria to Graduation

✅ Criterion 1: Initial Requirements

Timeframe: First 2 Weeks
Guided Learning Hours (GLH): Minimum of 15 hours
Task Completion: First four tasks

Due Date: 24 March 2024

✅ Criterion 2: Mid-Course Progress

60 Guided Learning Hours

Data Science - **13 tasks**
Software Engineering - **13 tasks**
Web Development - **13 tasks**

Due Date: 28 April 2024

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Skills Bootcamp Progression Overview

✅ Criterion 3: Course Progress

Completion: All mandatory tasks, including Build Your Brand and resubmissions by study period end
Interview Invitation: Within 4 weeks post-course
Guided Learning Hours: Minimum of 112 hours by support end date (10.5 hours average, each week)

✅ Criterion 4: Demonstrating Employability

Final Job or Apprenticeship Outcome: Document within 12 weeks post-graduation
Relevance: Progression to employment or related opportunity

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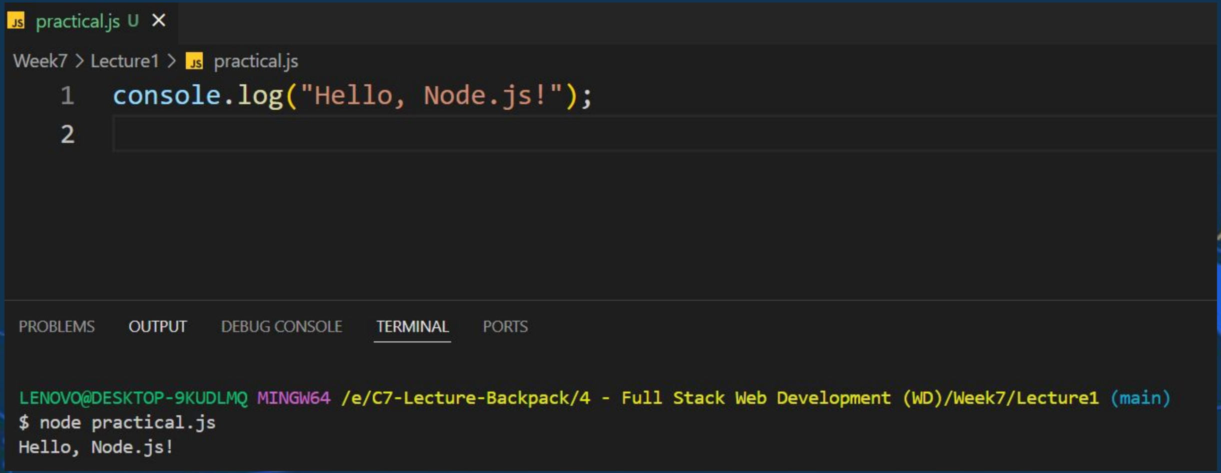
What is Node.js?

❖ Node.js is a runtime environment that allows you to run JavaScript code on the server-side.

❖ It uses an event-driven, non-blocking I/O model, making it efficient for handling asynchronous operations.



```javascript
console.log("Hello, Node.js!");
```

```
LENOVO@DESKTOP-9KUDLMQ MINGW64 /e/C7-Lecture-Backpack/4 - Full Stack Web Development (WD)/Week7/Lecture1 (main)
$ node practical.js
Hello, Node.js!
```

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What are Modules?

- ❖ Modules in Node.js are encapsulated units of functionality that can be reused throughout your application.
- ❖ They promote code organization, maintainability, and reusability.
- ❖ Node.js implements the CommonJS module system, allowing modules to be defined using require() and exported using module.exports.

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Creating and Using Modules

- ❖ Modules in Node.js are encapsulated units of functionality that can be reused throughout your application.
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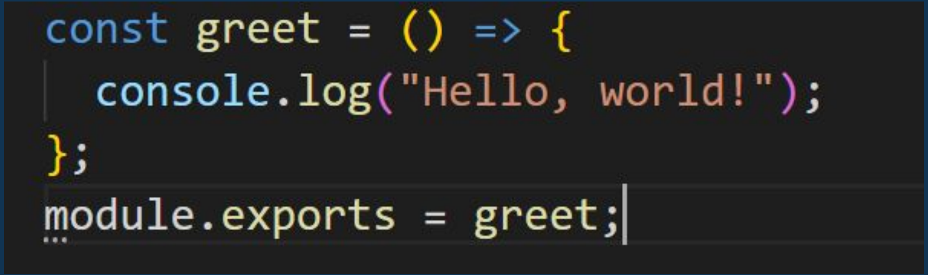
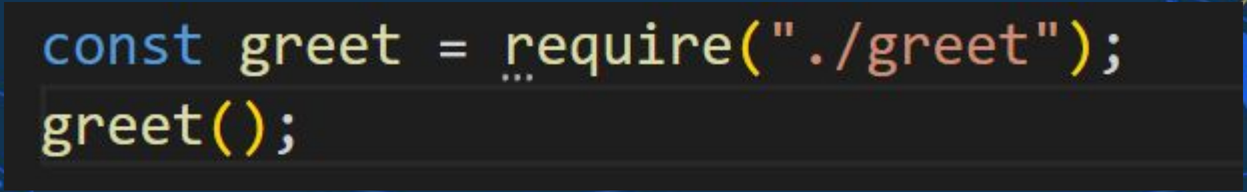


```
const greet = () => {
  console.log("Hello, world!");
};
module.exports = greet;
```



```
const greet = require("./greet");
greet();
```

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NPM (Node Package Manager)

- ❖ NPM is the default package manager for Node.js, used for installing, managing, and sharing packages of JavaScript code.
- ❖ It provides access to a vast repository of open-source packages and tools for Node.js development.

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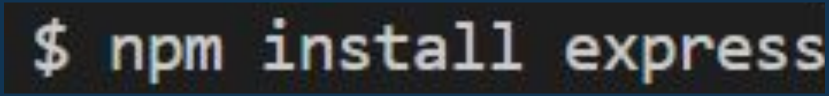
Managing Dependencies with NPM

- Define project dependencies in the package.json file.
- Use npm install to install dependencies listed in package.json.



```
$ npm install express
```

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Creating a package.json File

- Use **npm init** to generate a package.json file interactively or with default values.
- **package.json** serves as the manifest for your project, documenting project metadata, dependencies, and scripts.

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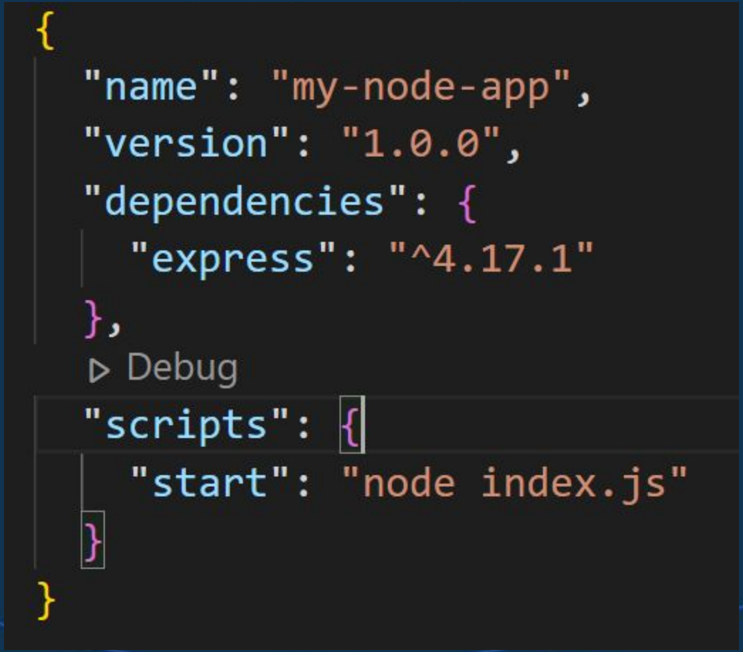
Understanding package.json Structure

- **name:** The name of the project.
- **version:** The version of the project.
- **dependencies:** List of project dependencies and their version specifications.
- **scripts:** Custom scripts for tasks like testing, building, and deployment.

Understanding package.json Structure



```
{
  "name": "my-node-app",
  "version": "1.0.0",
  "dependencies": {
    "express": "^4.17.1"
  },
  ▷ Debug
  "scripts": {
    "start": "node index.js"
  }
}
```

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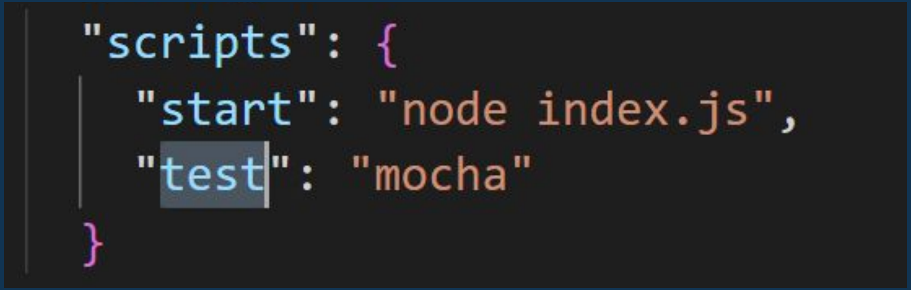
Managing Scripts in package.json

- Use the **scripts** field in **package.json** to define custom scripts.
- Scripts can be executed using **npm run <script-name>**.



```
"scripts": {
  "start": "node index.js",
  "test": "mocha"
}
```

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React Introduction

- ❖ ReactJS is a declarative, efficient, and flexible JavaScript library for building reusable UI components.
- ❖ It is an open-source, component-based front end library responsible only for the view layer of the application.
- ❖ A ReactJS application is made up of multiple components, each component responsible for outputting a small, reusable piece of code.
- ❖ The components are the heart of all React applications. These Components can be nested with other components to allow complex applications to be built of simple building blocks.

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Rendering in React

- ❖ React renders HTML to the web page by using a function called **createRoot()** and its method **render()**.
- ❖ The **createRoot()** function takes one argument, an HTML element. The purpose of the function is to define the HTML element where a React component should be displayed.
- ❖ The **render()** method is then called to define the React component that should be rendered.

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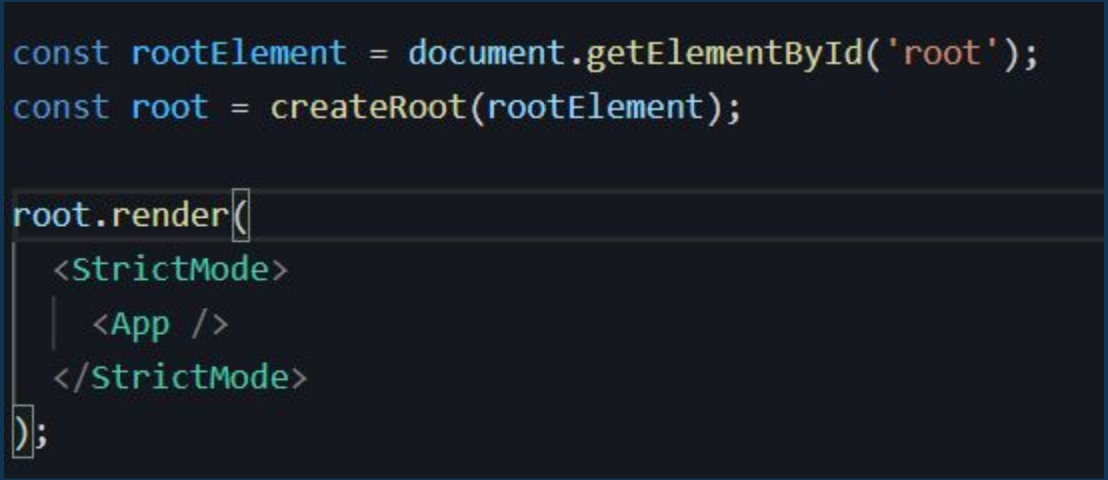
Rendering in React



```
const rootElement = document.getElementById('root');
const root = createRoot(rootElement);

root.render(
  <StrictMode>
    <App />
  </StrictMode>
);
```

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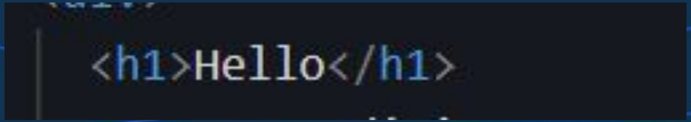
React JSX

- JSX(JavaScript Extension), is a React extension which allows writing JavaScript code that looks like HTML.
- In other words, JSX is an HTML-like syntax used by React that extends ECMAScript so that HTML-like syntax can co-exist with JavaScript/React code.
- JSX allows you to write HTML/XML-like structures (e.g., DOM-like tree structures) in the same file where you write JavaScript code, then preprocessor will transform these expressions into actual JavaScript code.



```
<h1>Hello</h1>
```

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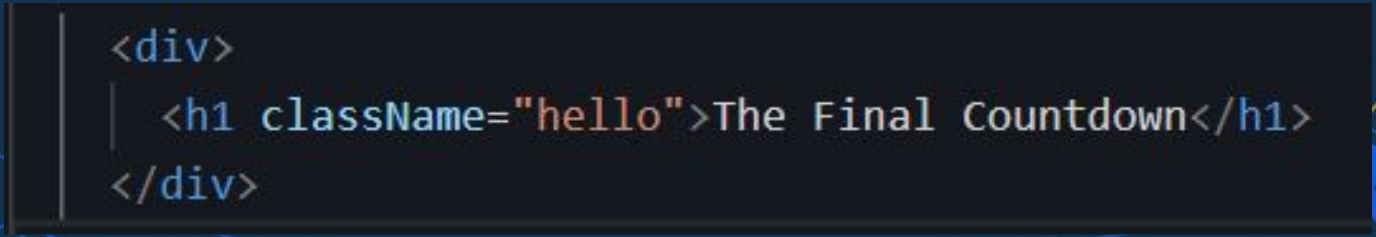
JSX Attributes

- ❖ JSX use attributes with the HTML elements same as regular HTML.
- ❖ JSX uses camelcase naming convention for attributes rather than standard naming convention of HTML such as a class in HTML becomes className in JSX because the class is the reserved keyword in JavaScript.



```
<div>
  <h1 className="hello">The Final Countdown</h1>
</div>
```

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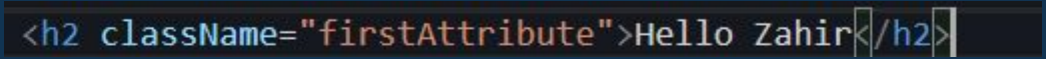
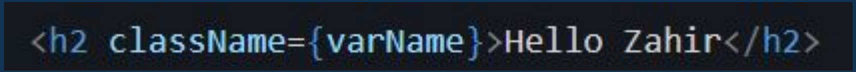
JSX Attributes

- ❖ In JSX, we can specify attribute values in two ways:
  - ➢ As String Literals: We can specify the values of attributes in double quotes.



```
<h2 className="firstAttribute">Hello Zahir</h2>
```

  - ➢ As Expressions: We can specify the values of attributes as expressions using curly braces **{}**



```
<h2 className={varName}>Hello Zahir</h2>
```

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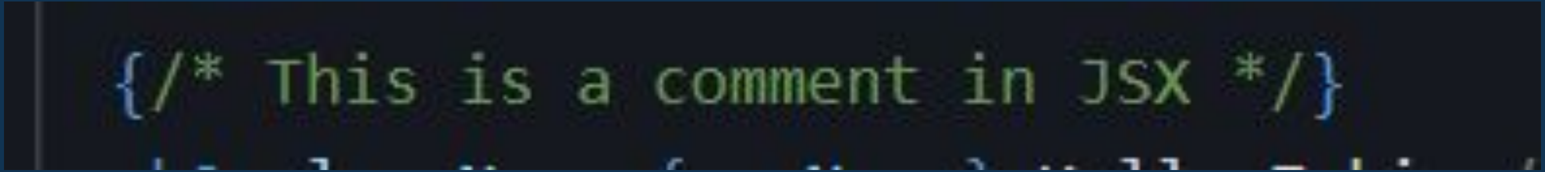
JSX Comments

❖ JSX allows us to use comments that begin with /* and ends with */ and wrapping them in curly braces {}.



```
{/* This is a comment in JSX */}
```

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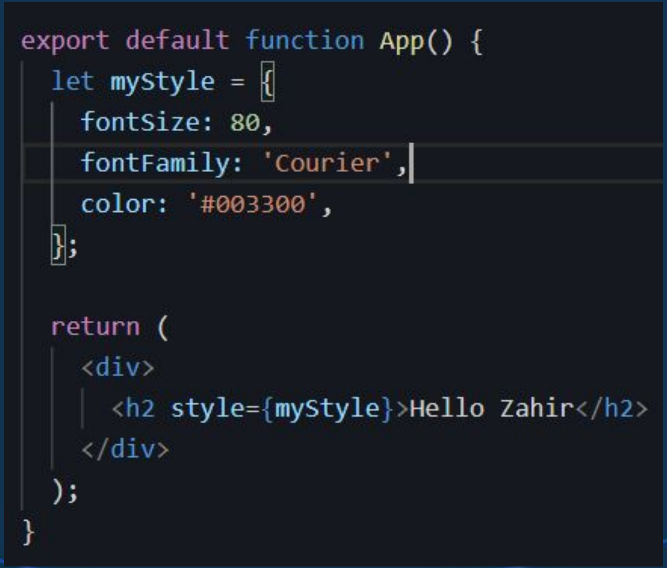
JSX Styling

❖ To set inline styles, you need to use camelCase syntax.



```
export default function App() {
  let myStyle = {
    fontSize: 80,
    fontFamily: 'Courier',
    color: '#003300',
  };

  return (
    <div>
      <h2 style={myStyle}>Hello Zahir</h2>
    </div>
  );
}
```

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React Components

- A Component is considered as the core building blocks of a React application.
- It makes the task of building UIs much easier.
- Each component exists in the same space, but they work independently from one another and merge all in a parent component, which will be the final UI of your application.
- All React components have their own structure, methods as well as APIs. They can be reusable as per your need.

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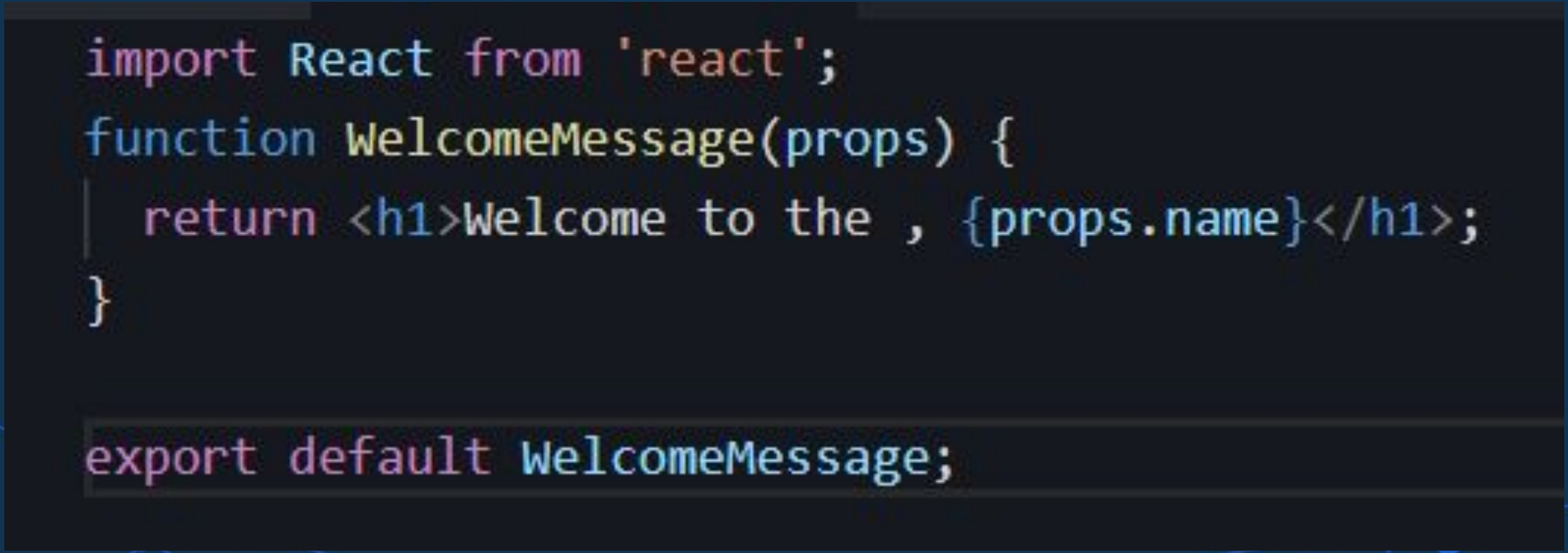
Functional Components



```
import React from 'react';
function WelcomeMessage(props) {
  return <h1>Welcome to the , {props.name}</h1>;
}

export default WelcomeMessage;
```

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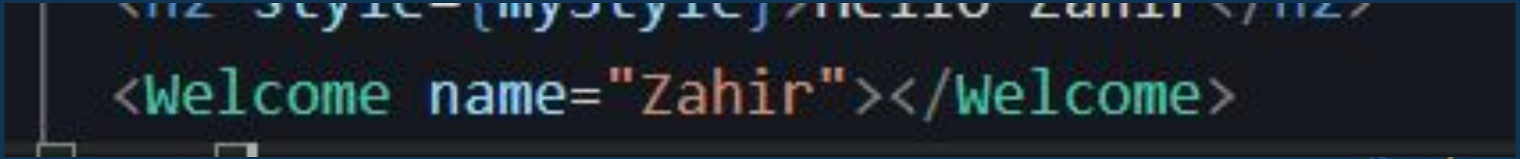
Props

- ❖ Components can be passed props, which stands for properties.
- ❖ Props are like function arguments, and you send them into the component as attributes.



```
<Welcome name="Zahir"></Welcome>
```

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Questions and Answers

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Thank you for attending

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