Welcome to the CoGrammar Lecture: Hooks

The session will start shortly...

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

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**

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

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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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Learning Objectives

- ❖ Understand the concept of **React Hooks** and their role in modern React development.
- ❖ Implement state management using the **useState** hook.
- ❖ Utilize the **useEffect** hook to manage side effects in functional components.
- ❖ Apply the **useRef** hook to access DOM elements and store mutable values.
- ❖ Create **functional components** that leverage **multiple hooks** for various functionalities.

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React Hooks

JavaScript functions that allow functional components to access React features, like state and side effects.

- ❖ Before the Hooks, **class components** were used, which allowed internal state to be managed and lifecycle events to be handled directly.
- ❖ React Hooks allow us to work with React components in a **simpler and more concise** way, without having to write classes.
- ❖ Hooks also make our code more **readable** and **maintainable**.
- ❖ There are **many types of hooks**, and **custom hooks** can be defined as well.
- ❖ This lecture will be covering state, effect and ref hooks.

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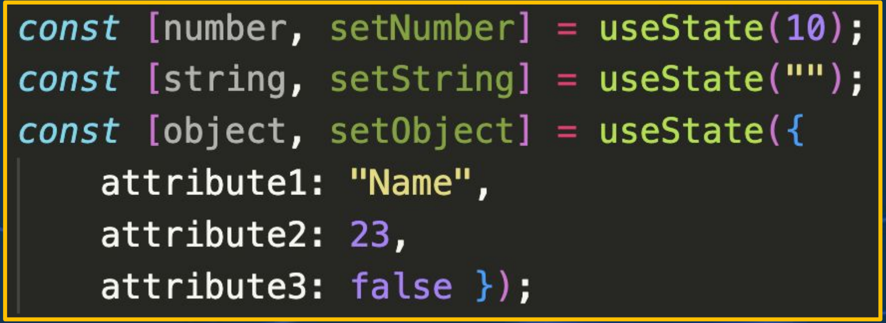
State Hook

Hook used for state management, allowing components to store and retrieve information.

❖ The **useState** hook declares a **state variable**, which is **preserved between function calls** and whose **change triggers a rerender**.

❖ The function **accepts** the **initial state** of the variable as input.

❖ The function **returns** a pair of values: the **state variable** and the **function that updates it**.



```
const [number, setNumber] = useState(10);
const [string, setString] = useState("");
const [object, setObject] = useState({
    attribute1: "Name",
    attribute2: 23,
    attribute3: false });
```

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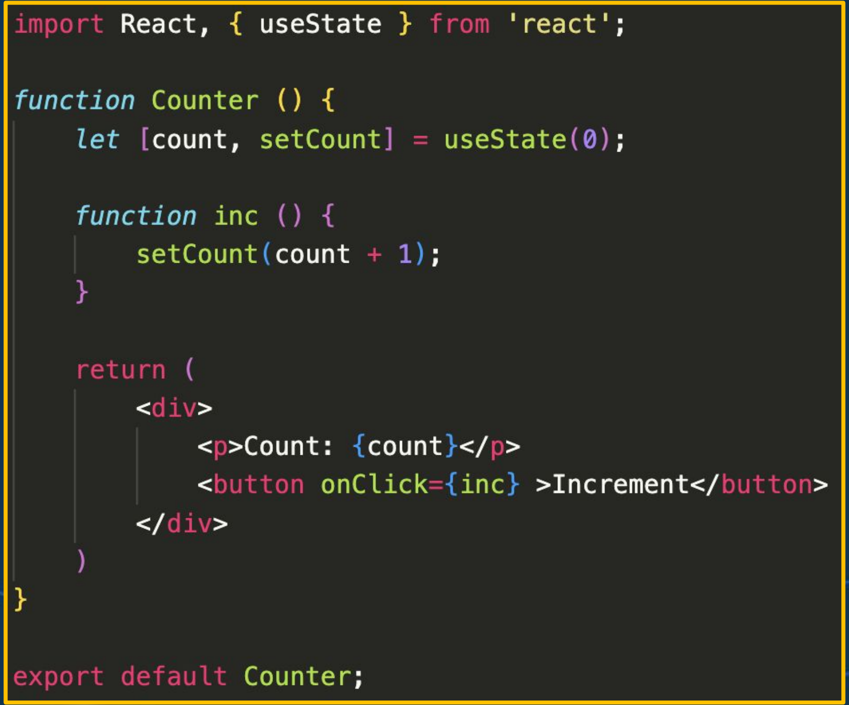
Function Components Recap: JavaScript functions which accept a single prop object as input and use hooks to create reusable pieces of UI by returning React elements.



```
import React, { useState } from 'react';

function Counter () {
    let [count, setCount] = useState(0);

    function inc () {
        setCount(count + 1);
    }

    return (
        <div>
            <p>Count: {count}</p>
            <button onClick={inc} >Increment</button>
        </div>
    )
}

export default Counter;
```

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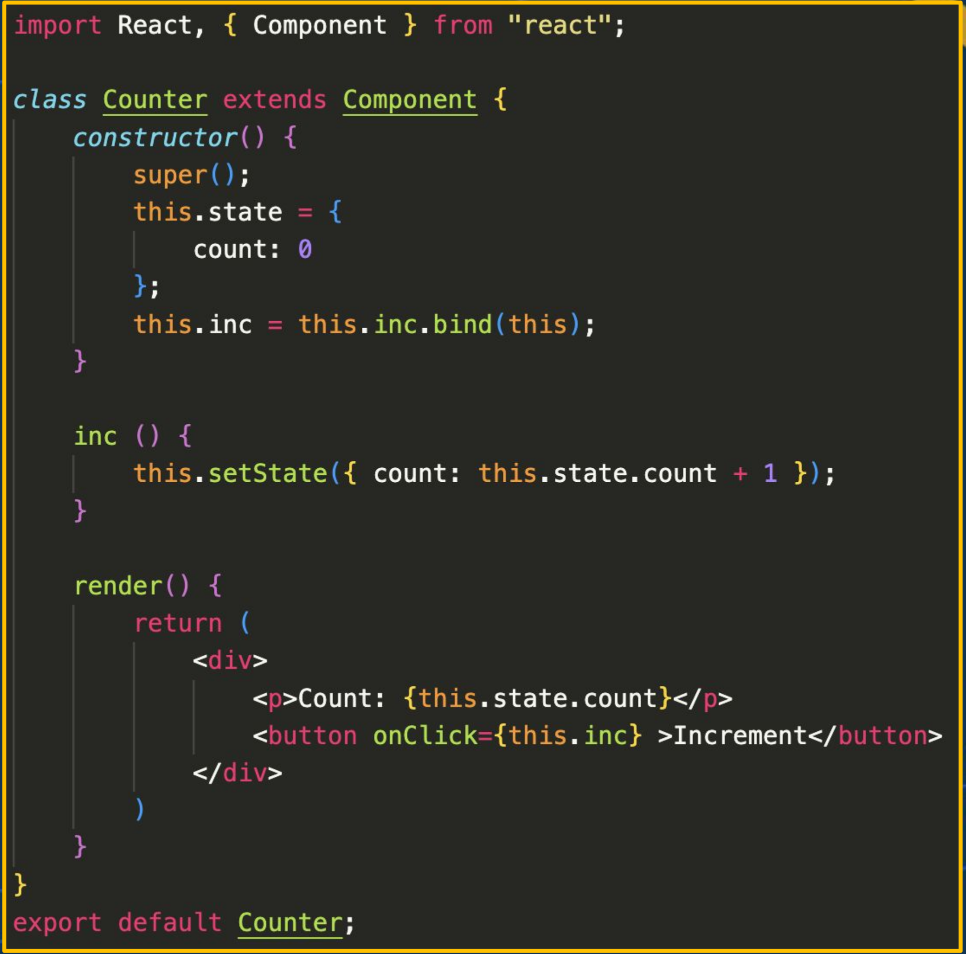
This is how we would implement the counter with a class component.



```
import React, { Component } from "react";

class Counter extends Component {
    constructor() {
        super();
        this.state = {
            count: 0
        };
        this.inc = this.inc.bind(this);
    }

    inc () {
        this.setState({ count: this.state.count + 1 });
    }

    render() {
        return (
            <div>
                <p>Count: {this.state.count}</p>
                <button onClick={this.inc} >Increment</button>
            </div>
        )
    }
}
export default Counter;
```

Let's Breathe!

Let's take a small break before moving on to the next topic.

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Effect Hook

Hook used for connecting to and synchronizing external systems after your components are rendered, known as performing side effects.

❖ The **useEffect** hook is used for tasks like **fetching data**, directly **updating the DOM** and setting up **event listeners**.

❖ The function takes in two arguments: a **block of code** which will be executed when the component is loaded, and a **dependencies list**, which is a list of variables whose change will trigger the first argument to be rerun.

❖ If **no dependency argument** is passed, the first argument will run on **every render**.

❖ If an **empty dependency argument** is passed, the first argument will on be run on the first render of the component.

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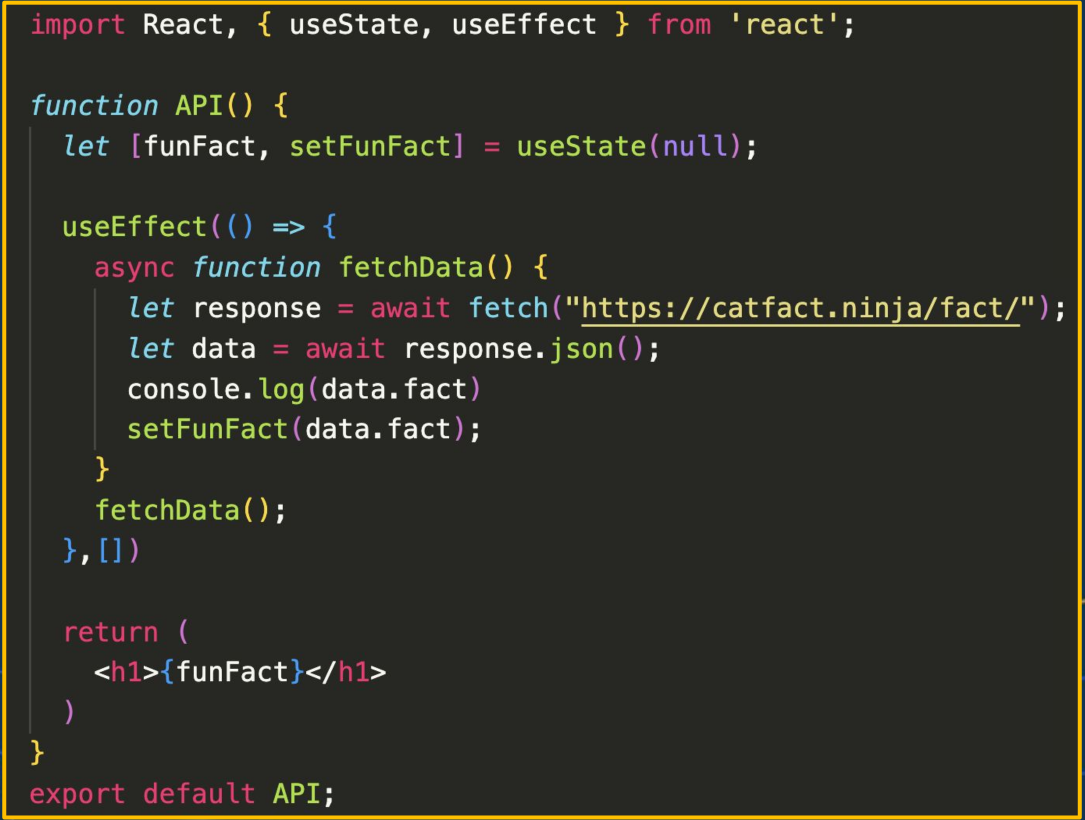
Fetch Data from API



```
import React, { useState, useEffect } from 'react';

function API() {
  let [funFact, setFunFact] = useState(null);

  useEffect(() => {
    async function fetchData() {
      let response = await fetch("https://catfact.ninja/fact/");
      let data = await response.json();
      console.log(data.fact)
      setFunFact(data.fact);
    }
    fetchData();
  },[])

  return (
    <h1>{funFact}</h1>
  )
}
export default API;
```

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Cleanup Function

Function returned by the useEffect hook which gets executed before every rerun of the component and after the component is removed.

- ❖ Tasks that can be performed in the useEffect hook, may need to be **aborted or stopped** when the **component is removed** or when **state changes**.
- ❖ For example, API calls may need to be aborted, timers stopped and connections removed.
- ❖ If this is not handled properly, your code may attempt to update a state variable which no longer exists, resulting in a **memory leak**.
- ❖ This is done with a **cleanup function**, which is **returned by the useEffect hook**. This function will run when the component is **removed** or **rerendered**.

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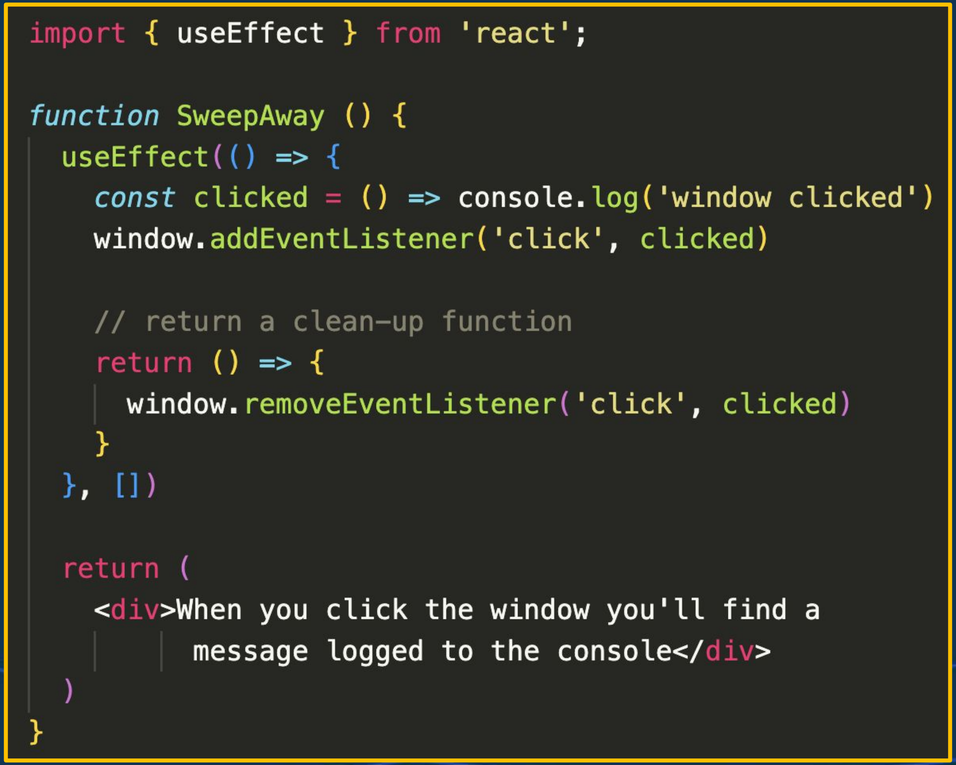
Cleanup Function



```
import { useEffect } from 'react';

function SweepAway () {
  useEffect(() => {
    const clicked = () => console.log('window clicked')
    window.addEventListener('click', clicked)

    // return a clean-up function
    return () => {
      window.removeEventListener('click', clicked)
    }
  }, [])

  return (
    <div>When you click the window you'll find a
        message logged to the console</div>
  )
}
```

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Ref Hook

Hook used to store mutable values which do not trigger re-renders and update DOM elements directly.

- ❖ The **useRef** hook is store values which **persist between re-renders**, but **do not cause the component to re-render** when changed.
- ❖ We can also access DOM elements using useRef by passing the returned object to elements in the **ref** attribute.
- ❖ The function accepts an **initial value** as an **input**.
- ❖ The function returns an **object** with the property **current** initialised to the value passed as input to the function.

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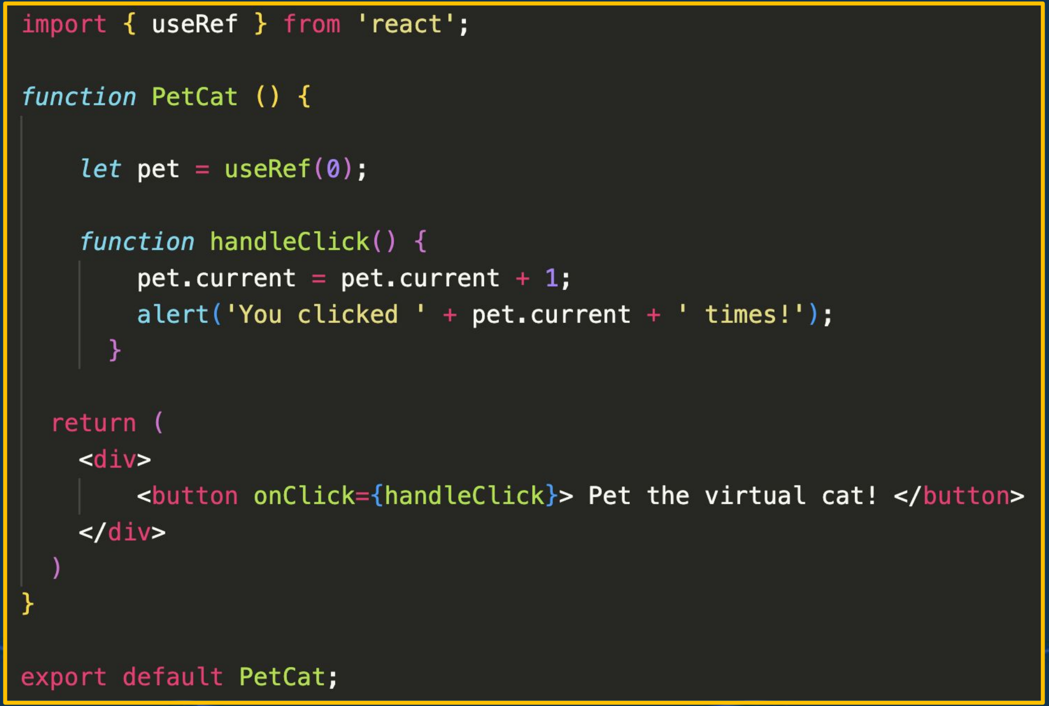
Ref Hook



```
import { useRef } from 'react';

function PetCat () {

  let pet = useRef(0);

  function handleClick() {
    pet.current = pet.current + 1;
    alert('You clicked ' + pet.current + ' times!');
   }

 return (
  <div>
    <button onClick={handleClick}> Pet the virtual cat! </button>
  </div>
 )
}

export default PetCat;
```

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Questions and Answers

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Thank you for attending

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