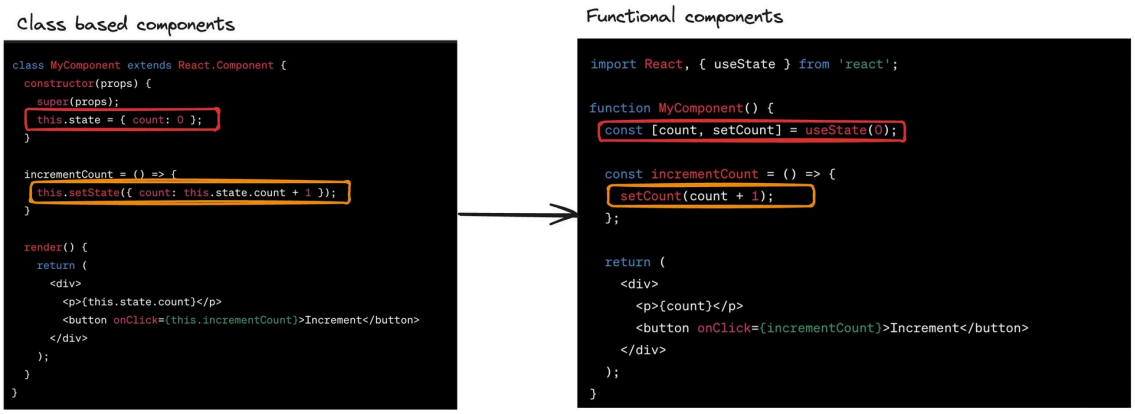
1 - What are hooks

What are hooks

Hooks are a feature introduced in `React 16.8` that allow you to use state and other React features without writing a class. They are functions that let you "hook into" React state and lifecycle features from function components.

State



▼ Functional

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

function MyComponent() {
  const [count, setCount] = useState(0);

  const incrementCount = () => {
    setCount(count + 1);
  };

  return (
    <div>
      <p>{count}</p>
      <button onClick={incrementCount}>Increment</button>
    </div>
  );
}
```

Copy

▼ Class Based

```react
class MyComponent extends React.Component {
  constructor(props) {
    super(props);
    this.state = { count: 0 };
```

Copy

```
  }

  incrementCount = () => {
    this.setState({ count: this.state.count + 1 });
  }

  render() {
    return (
      <div>
        <p>{this.state.count}</p>
        <button onClick={this.incrementCount}>Increment</button>
      </div>
    );
  }
}
```

Lifecycle events

▼ Functional

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

function MyComponent() {
  useEffect(() => {
    // Perform setup or data fetching here

    return () => {
      // Cleanup code (similar to componentWillUnmount)
    };
  }, []);

  // Render UI
}
```

▼ Class based

```
class MyComponent extends React.Component {                            Copy
  componentDidMount() {
    // Perform setup or data fetching here
  }

  componentWillUnmount() {
```

```
    // Clean up (e.g., remove event listeners or cancel subscriptions)
  }

  render() {
    // Render UI
  }
}
```

▼ Functional solution

```
import React, { useEffect, useState } from 'react'                    Copy
import './App.css'

function App() {
  const [render, setRender] = useState(true);

  useEffect(() => {
    setInterval(() => {
      setRender(r => !r);
    }, 5000)
  }, []);

  return (
    <>
      {render ? <MyComponent /> : <div></div>}
    </>
  )
}


function MyComponent() {
  useEffect(() => {
    console.error("component mounted");

    return () => {
      console.log("component unmounted");
    };
  }, []);

  return <div>
    From inside my component
  </div>
}

export default App
```

Until now we're seen some commonly used hooks in React-

1. useState
2. useEffect
3. useMemo
4. useCallback

These hooks are provided to you by the `React` library.

2 - What are custom hooks

`Hooks` that you create yourself, so other people can use them are called custom hooks.

A `custom hook` is effectively a function, but with the following properties -

1. Uses another hook internally (useState, useEffect, another custom hook)
2. Starts with `use`

A few good examples of this can be

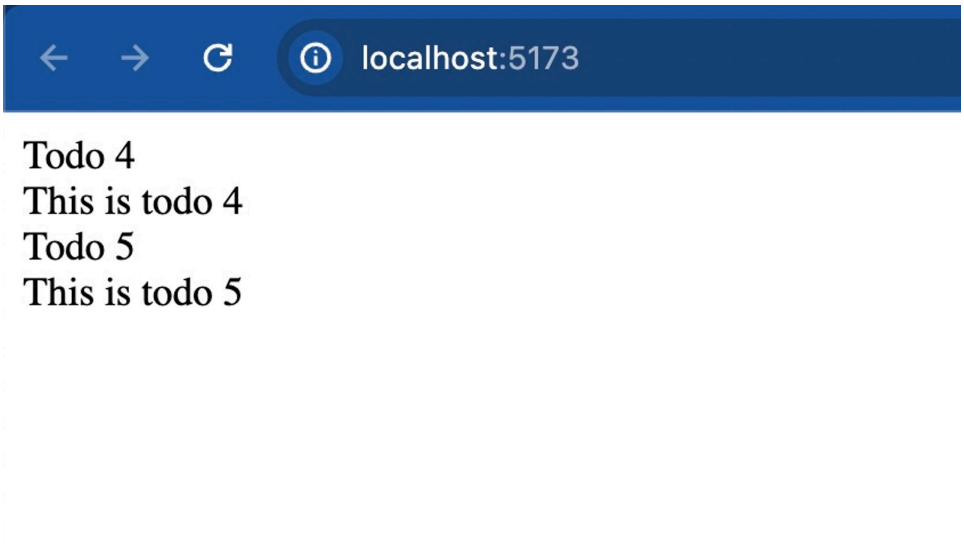
1. Data fetching hooks
2. Browser functionality related hooks - **useOnlineStatus , useWindowSize, useMousePosition**
3. Performance/Timer based - **useInterval, useDebounce**

3 - Data fetching hooks

Data fetching hooks can be used to encapsulate all the logic to fetch the data from your backend

For example, look at the following code-

```
import { useEffect, useState } from 'react'                Copy
import axios from 'axios'

function App() {
  const [todos, setTodos] = useState([])

  useEffect(() => {
    axios.get("https://sum-server.100xdevs.com/todos")
      .then(res => {
        setTodos(res.data.todos);
      })
  }, [])

  return (
    <>
      {todos.map(todo => <Track todo={todo} />)}
    </>
  )
}

function Track({ todo }) {
  return <div>
    {todo.title}
    <br />
    {todo.description}
  </div>
}

export default App
```



Step 1 - Converting the `data fetching` bit to a custom hook

```
import { useEffect, useState } from 'react'                    Copy
import axios from 'axios'

function useTodos() {
  const [todos, setTodos] = useState([])

  useEffect(() => {
    axios.get("https://sum-server.100xdevs.com/todos")
      .then(res => {
        setTodos(res.data.todos);
      })
  }, [])

  return todos;
}

function App() {
  const todos = useTodos();

  return (
    <>
      {todos.map(todo => <Track todo={todo} />)}
    </>
  )
}

function Track({ todo }) {
  return <div>
    {todo.title}
    <br />
    {todo.description}
  </div>
}
```

```
export default App
```

Step 2 - Cleaning the hook to include a `loading` parameter

What if you want to show a loader when the data is not yet fetched from the backend?

Copy

```
import { useEffect, useState } from 'react'
import axios from 'axios'

function useTodos() {
  const [loading, setLoading] = useState(true);
  const [todos, setTodos] = useState([])

  useEffect(() => {
    axios.get("https://sum-server.100xdevs.com/todos")
      .then(res => {
        setTodos(res.data.todos);
        setLoading(false);
      })
  }, [])

  return {
    todos: todos,
    loading: loading
  };
}

function App() {
  const { todos, loading } = useTodos();

  if (loading) {
    return <div>
      Loading...
    </div>
  }

  return (
    <>
      {todos.map(todo => <Track todo={todo} />)}
    </>
  )
}

function Track({ todo }) {
  return <div>
    {todo.title}
    <br />
    {todo.description}
  </div>
}
```

```
export default App
```

Step 3 - Auto refreshing hook

What if you want to keep polling the backend every n seconds? `n` needs to be passed in as an input to the hook

```
import { useEffect, useState } from 'react'                Copy
import axios from 'axios'

function useTodos(n) {
  const [loading, setLoading] = useState(true);
  const [todos, setTodos] = useState([])

  function getData() {
    axios.get("https://sum-server.100xdevs.com/todos")
      .then(res => {
        setTodos(res.data.todos);
        setLoading(false);
      })
  }

  useEffect(() => {
    setInterval(() => {
      getData();
    }, n * 1000)
    getData();
  }, [n])

  return {
    todos: todos,
    loading: loading
  };
}

function App() {
  const { todos, loading } = useTodos(5);

  if (loading) {
    return <div>
      Loading...
    </div>
  }

  return (
    <>
      {todos.map(todo => <Track todo={todo} />)}
    </>
  )
}
```

```
function Track({ todo }) {
  return <div>
    {todo.title}
    <br />
    {todo.description}
  </div>
}

export default App
```

▼ Final solution

Copy

```
import { useEffect, useState } from 'react'
import axios from 'axios'

function useTodos(n) {
  const [todos, setTodos] = useState([])
  const [loading, setLoading] = useState(true);

  useEffect(() => {
    const value = setInterval(() => {
      axios.get("https://sum-server.100xdevs.com/todos")
        .then(res => {
          setTodos(res.data.todos);
          setLoading(false);
        })
    }, n * 1000)

    axios.get("https://sum-server.100xdevs.com/todos")
      .then(res => {
        setTodos(res.data.todos);
        setLoading(false);
      })

    return () => {
      clearInterval(value)
    }
  }, [n])

  return {todos, loading};
}

function App() {
  const {todos, loading} = useTodos(10);

  if (loading) {
    return <div> loading... </div>
  }

  return (
    <>
      {todos.map(todo => <Track todo={todo} />)}
    </>
  )
```

```
}

function Track({ todo }) {
  return <div>
    {todo.title}
    <br />
    {todo.description}
  </div>
}

export default App
```

swr - React Hooks for Data Fetching

swr is a popular React library that creates a lot of these hooks for you, and you can use it directly.

For example -

```
import useSWR from 'swr'

// const fetcher = (url) => fetch(url).then((res) => res.json());
const fetcher = async function(url) {
  const data = await fetch(url);
  const json = await data.json();
  return json;
};

function Profile() {
  const { data, error, isLoading } = useSWR('https://sum-server.100xdevs.com/todos',

  if (error) return <div>failed to load</div>
  if (isLoading) return <div>loading...</div>
  return <div>hello, you have {data.todos.length} todos!</div>
}
```

Copy

4 - Browser functionality related hooks

1. `useIsOnline` hook

Create a hook that returns true or false based on weather the user is currently online

You are given that -

1. window.navigator.onLine returns `true` or `false` based on weather the user is online
2. You can attach the following event listeners to listen to weather the user is online or not

```
window.addEventListener('online', () => console.log('Became online'));
```

Copy

```
window.addEventListener('offline', () => console.log('Became offline'));
```

▼ Solution

```
import { useEffect, useState } from 'react'                                    Copy

function useIsOnline() {
  const [isOnline, setIsOnline] = useState(window.navigator.onLine);

  useEffect(() => {
    window.addEventListener('online', () => setIsOnline(true));
    window.addEventListener('offline', () => setIsOnline(false));
  }, [])

  return isOnline;
}

function App() {
  const isOnline = useIsOnline(5);

  return (
    <>
      {isOnline ? "You are online yay!" : "You are not online"}
    </>
  )
}

export default App
```

2. `useMousePointer` hook

Create a hook that returns you the current mouse pointer position.

The final react app that uses it looks like this

You are given that

```
window.addEventListener('mousemove', handleMouseMove);
```
Copy

will trigger the `handleMouseMove` function anytime the mouse pointer is moved.

▼ Solution

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

const useMousePointer = () => {
  const [position, setPosition] = useState({ x: 0, y: 0 });

  const handleMouseMove = (e) => {
    setPosition({ x: e.clientX, y: e.clientY });
  };

  useEffect(() => {
    window.addEventListener('mousemove', handleMouseMove);
    return () => {
      window.removeEventListener('mousemove', handleMouseMove);
    };
  }, []);

  return position;
};

function App() {
  const mousePointer = useMousePointer();

  return (
    <>
      Your mouse position is {mousePointer.x} {mousePointer.y}
    </>
  )
}

export default App
```
Copy

5 - Performance/Timer based

1. useInterval

Create a hook that runs a certain callback function every n seconds.

You have to implement `useInterval` which is being used in the code below -

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

function App() {
  const [count, setCount] = useState(0);

  useInterval(() => {
    setCount(c => c + 1);
  }, 1000)

  return (
    <>
      Timer is at {count}
    </>
  )
}

export default App
```

Final app should look like this

▼ Solution

```
const useInterval = (callback, delay) => {
  useEffect(() => {
    const intervalId = setInterval(callback, delay);
```

```
    return () => clearInterval(intervalId);
  }, [callback, delay]);
};
```

2. useDebounce

Create a hook that debounces a value given

1. The value that needs to be debounced
2. The interval at which the value should be debounced.

```
import React, { useState } from 'react';
import useDebounce from './useDebounce';

const SearchBar = () => {
  const [inputValue, setInputValue] = useState('');
  const debouncedValue = useDebounce(inputValue, 500); // 500 milliseconds debounce

  // Use the debouncedValue in your component logic, e.g., trigger a search API call

  return (
    <input
      type="text"
      value={inputValue}
      onChange={(e) => setInputValue(e.target.value)}
      placeholder="Search..."
    />
  );
};

export default SearchBar;
```

▼ Solution

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

const useDebounce = (value, delay) => {
  // State to store the debounced value
  const [debouncedValue, setDebouncedValue] = useState(value);

  useEffect(() => {
    // Set up a timer to update the debounced value after the specified
    const timerId = setTimeout(() => {
      setDebouncedValue(value);
    }, delay);

    // Clean up the timer if the value changes before the delay has pas
    return () => clearTimeout(timerId);
  }, [value, delay]);
```

```
  return debouncedValue;
};
```