Intro to Hooks

Mohamed Mukthar Ahmed

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Intro to Hooks

Outline

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Declaring Multiple State Variables

Props vs State

Q&A

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Q&A

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Intro to Hooks

Outline

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Intro to Hooks

- **Hooks** are a new addition in **React 16.8.**
- They let you use **state** and other **React** features (without writing a class).
- At React Conf 2018, Sophie Alpert and Dan Abramov introduced Hooks, followed by Ryan Florence demonstrating how to refactor an application to use them.
  - https://youtu.be/dpw9EHDh2bM
- Classes confuse both people and machines
- Hooks let you use more of React’s features without classes.

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What is a Hook?

- A **Hook** is a **special function** that lets you “hook into” React features.
- For example, **useState** is a Hook that lets you add **React state** to function components.

When would I use a Hook??

- If you write a function component and realize **you need to add some state** to it.
  - Previously you had to convert it to a class.
- Now you can use a Hook inside the existing function component.

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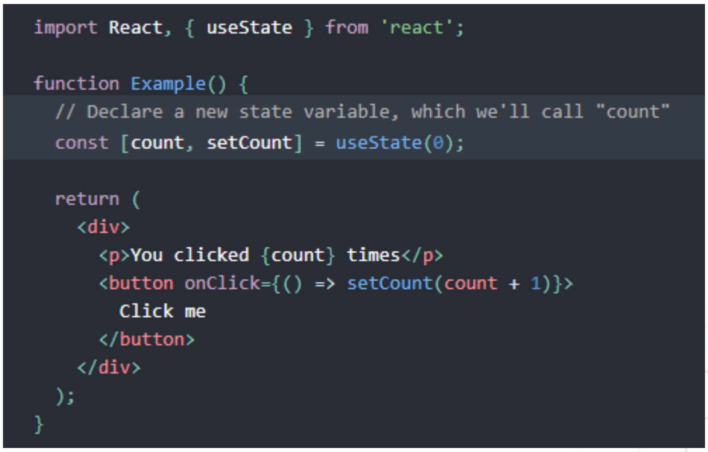
Using the State Hook



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

function Example() {
  // Declare a new state variable, which we'll call "count"
  const [count, setCount] = useState(0);

  return (
    <div>
      <p>You clicked {count} times</p>
      <button onClick={() => setCount(count + 1)}>
        Click me
      </button>
    </div>
  );
}
```

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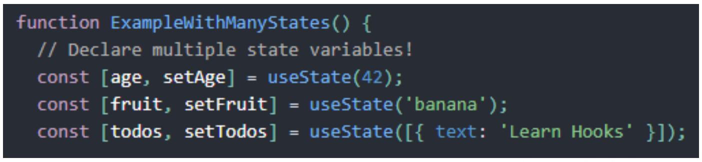
What does calling **useState** do?

- It declares a "**state variable**". Our variable is called **count**
- This is a way to "**preserve**" some values between the function calls.
- Normally, variables "**disappear**" when the function exits but state variables are preserved by React.
- The **only argument** to the **useState()** Hook is the **initial state**.
- It **returns a pair of values**: the **current state** and a **function** that updates it.

Hook names ***always*** start with **use**

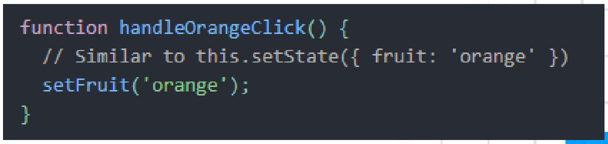
Declaring multiple state variables

- You can use the State Hook more than once in a single component



```
function ExampleWithManyStates() {
  // Declare multiple state variables!
  const [age, setAge] = useState(42);
  const [fruit, setFruit] = useState('banana');
  const [todos, setTodos] = useState([{ text: 'Learn Hooks' }]);
```

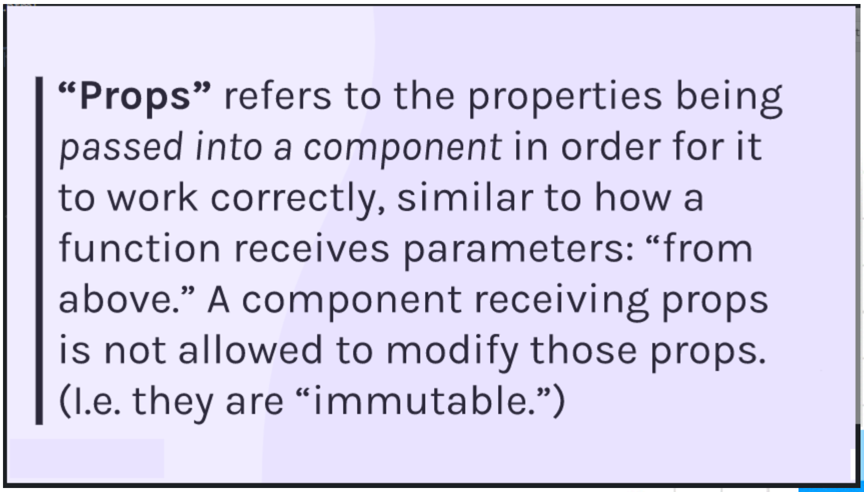
- In the above component, we have **age**, **fruit**, and **todos** as local variables, and we can update them individually.



```
function handleOrangeClick() {
  // Similar to this.setState({ fruit: 'orange' })
  setFruit('orange');
}
```

Hook names ***always*** start with **use**

Props vs State



> **“Props”** refers to the properties being *passed into a component* in order for it to work correctly, similar to how a function receives parameters: “from above.” A component receiving props is not allowed to modify those props. (I.e. they are “immutable.”)

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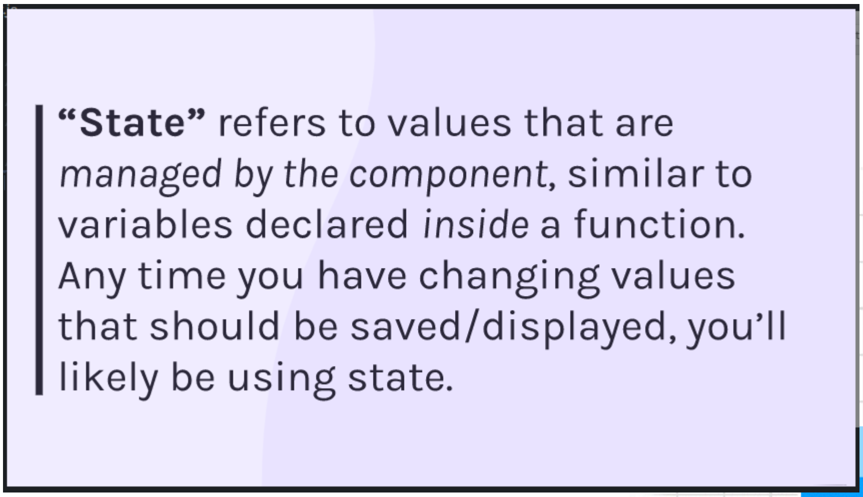
Props vs State



> **“State”** refers to values that are *managed by the component*, similar to variables declared *inside* a function. Any time you have changing values that should be saved/displayed, you’ll likely be using state.

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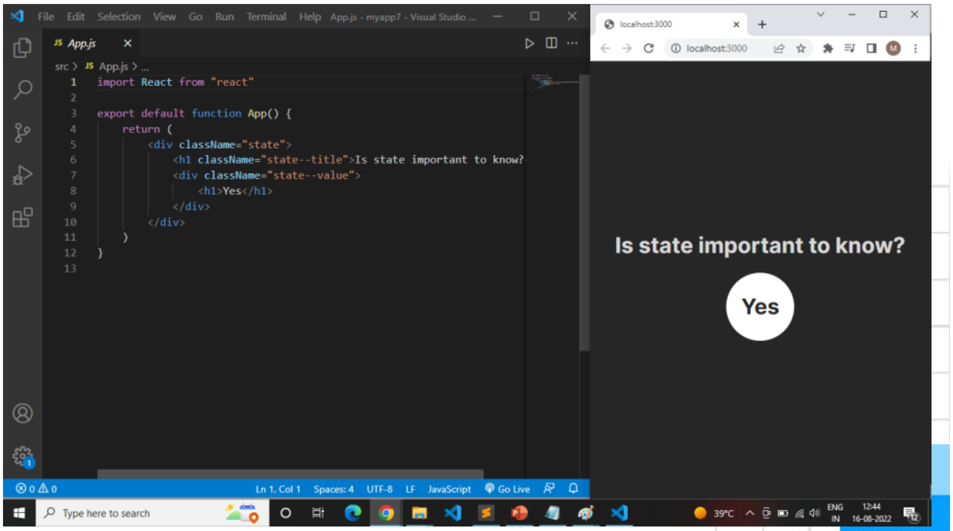
Understanding useState


File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
src > App.js > ...
localhost:3000
Ln 1, Col 1 Spaces: 4 UTF-8 LF JavaScript Go Live
Type here to search
39°C
ENG IN
12:44 16-08-2022

```
import React from "react"

export default function App() {
    return (
        <div className="state">
            <h1 className="state--title">Is state important to know?
            <div className="state--value">
                <h1>Yes</h1>
            </div>
        </div>
    )
}
```

Is state important to know?

Yes

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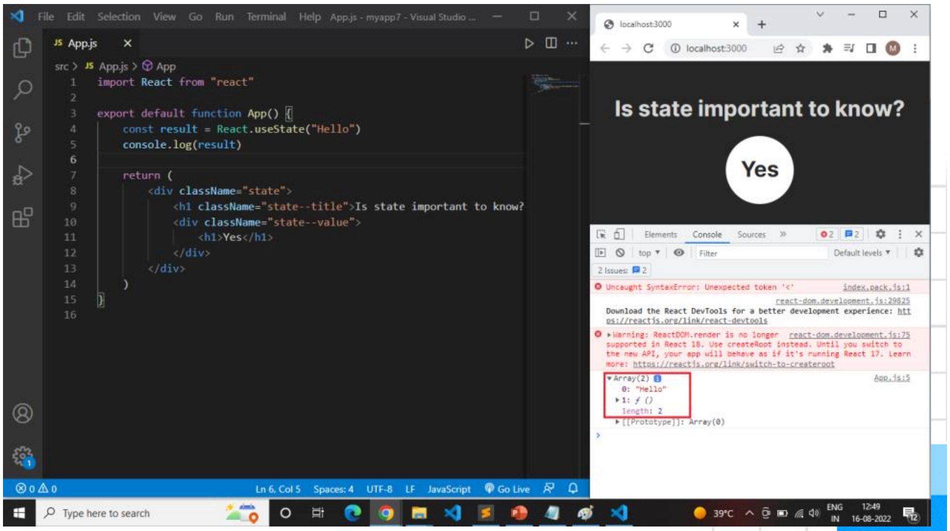
Understanding useState



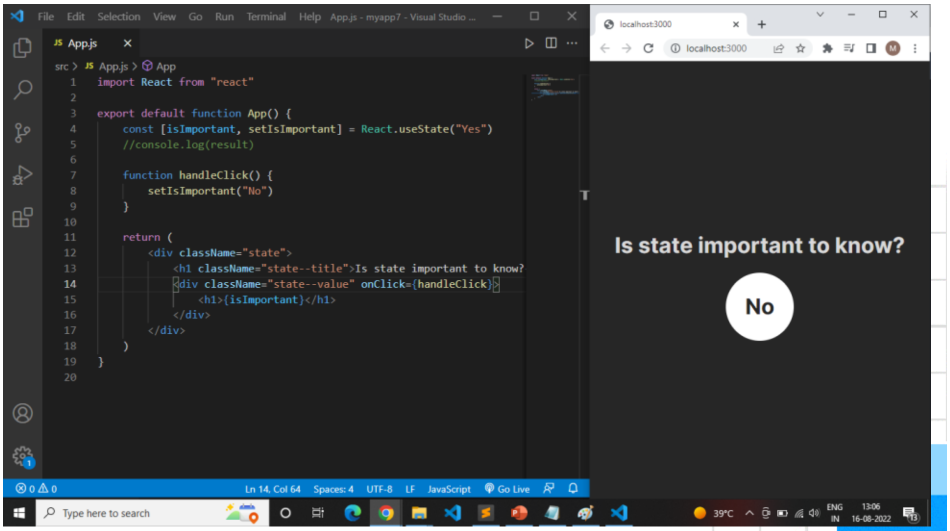
```
import React from "react"

export default function App() {
    const result = React.useState("Hello")
    console.log(result)

    return (
        <div className="state">
            <h1 className="state--title">Is state important to know?
            <div className="state--value">
                <h1>Yes</h1>
            </div>
        </div>
    )
}
```

Is state important to know?

Yes

```
Uncaught SyntaxError: Unexpected token '<'                    index.pack.js:1
                                         react-dom.development.js:29825
Download the React DevTools for a better development experience: https://reactjs.org/link/react-devtools
▸Warning: ReactDOM.render is no longer  react-dom.development.js:75
supported in React 18. Use createRoot instead. Until you switch to
the new API, your app will behave as if it's running React 17. Learn
more: https://reactjs.org/link/switch-to-createroot
▾Array(2)                                                     App.js:5
    0: "Hello"
  ▸1: ƒ ()
    length: 2
  ▸[[Prototype]]: Array(0)
```

useState – Array Destructuring

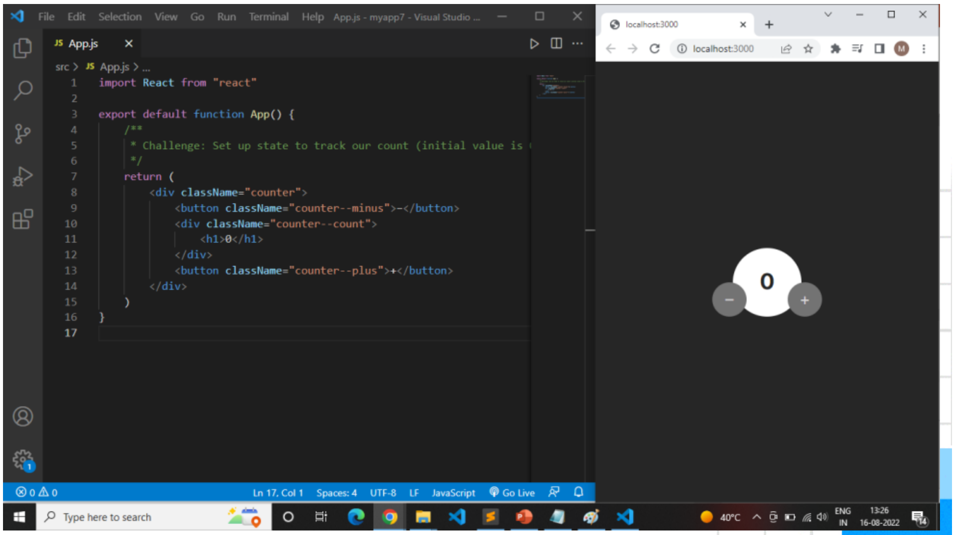


```
import React from "react"

export default function App() {
    const [isImportant, setIsImportant] = React.useState("Yes")
    //console.log(result)

    function handleClick() {
        setIsImportant("No")
    }

    return (
        <div className="state">
            <h1 className="state--title">Is state important to know?
            <div className="state--value" onClick={handleClick}>
                <h1>{isImportant}</h1>
            </div>
        </div>
    )
}
```

Is state important to know?

No

useState – Array Destructuring


File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
src > App.js > ...
localhost:3000
0
−
+
Ln 17, Col 1 Spaces: 4 UTF-8 LF JavaScript Go Live
Type here to search
40°C ENG IN 13:26 16-08-2022

```
import React from "react"

export default function App() {
    /**
     * Challenge: Set up state to track our count (initial value is (
     */
    return (
        <div className="counter">
            <button className="counter--minus">–</button>
            <div className="counter--count">
                <h1>0</h1>
            </div>
            <button className="counter--plus">+</button>
        </div>
    )
}
```

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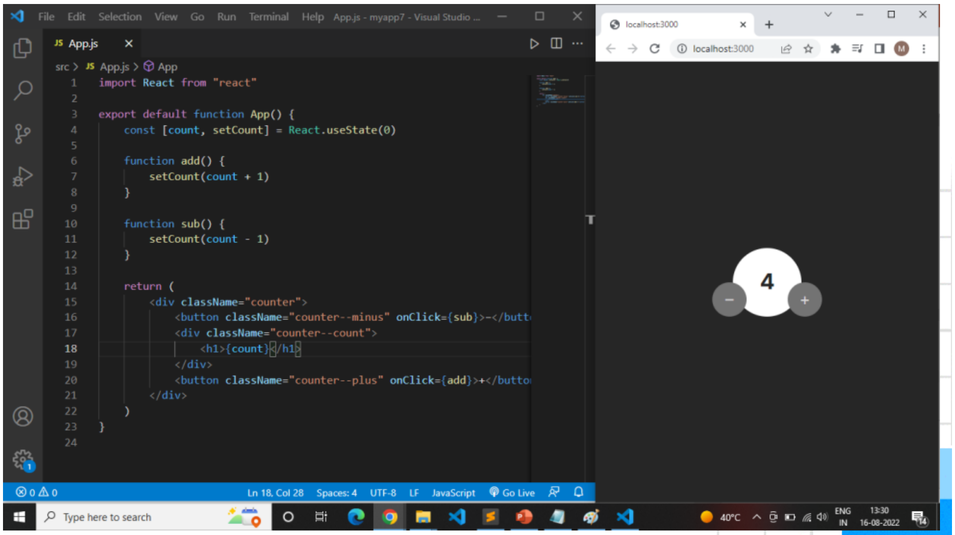
useState – Array Destructuring


File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
src > App.js > App
localhost:3000
4
−
+
Ln 18, Col 28 Spaces: 4 UTF-8 LF JavaScript Go Live
Type here to search
40°C ENG IN 13:30 16-08-2022

```
import React from "react"

export default function App() {
    const [count, setCount] = React.useState(0)

    function add() {
        setCount(count + 1)
    }

    function sub() {
        setCount(count - 1)
    }

    return (
        <div className="counter">
            <button className="counter--minus" onClick={sub}>–</butt
            <div className="counter--count">
                <h1>{count}</h1>
            </div>
            <button className="counter--plus" onClick={add}>+</butto
        </div>
    )
}
```

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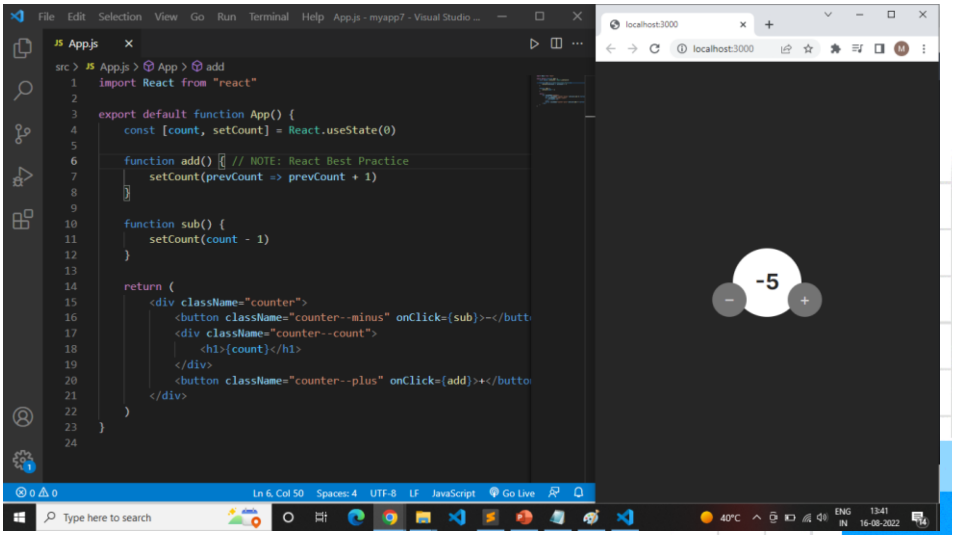
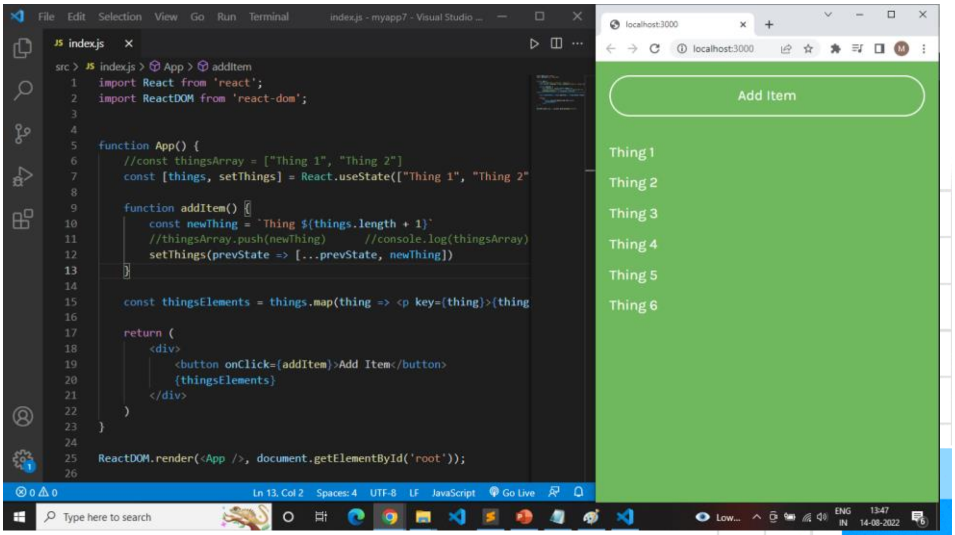
useState – Best Practice


File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
src > App.js > App > add
Ln 6, Col 50 Spaces: 4 UTF-8 LF JavaScript Go Live
localhost:3000
Type here to search
40°C ENG IN 13:41 16-08-2022

```
import React from "react"

export default function App() {
    const [count, setCount] = React.useState(0)

    function add() { // NOTE: React Best Practice
        setCount(prevCount => prevCount + 1)
    }

    function sub() {
        setCount(count - 1)
    }

    return (
        <div className="counter">
            <button className="counter--minus" onClick={sub}>-</butt
            <div className="counter--count">
                <h1>{count}</h1>
            </div>
            <button className="counter--plus" onClick={add}>+</butto
        </div>
    )
}
```

```
– -5 +
```

Add Item to UI


File Edit Selection View Go Run Terminal index.js - myapp7 - Visual Studio ...
index.js
src > index.js > App > addItem
Ln 13, Col 2 Spaces: 4 UTF-8 LF JavaScript Go Live
localhost:3000
Type here to search
Low... ENG IN 13:47 14-08-2022

```
import React from 'react';
import ReactDOM from 'react-dom';


function App() {
    //const thingsArray = ["Thing 1", "Thing 2"]
    const [things, setThings] = React.useState(["Thing 1", "Thing 2"

    function addItem() {
        const newThing = `Thing ${things.length + 1}`
        //thingsArray.push(newThing)      //console.log(thingsArray)
        setThings(prevState => [...prevState, newThing])
    }

    const thingsElements = things.map(thing => <p key={thing}>{thing

    return (
        <div>
            <button onClick={addItem}>Add Item</button>
            {thingsElements}
        </div>
    )
}

ReactDOM.render(<App />, document.getElementById('root'));
```

```
Add Item

Thing 1
Thing 2
Thing 3
Thing 4
Thing 5
Thing 6
```

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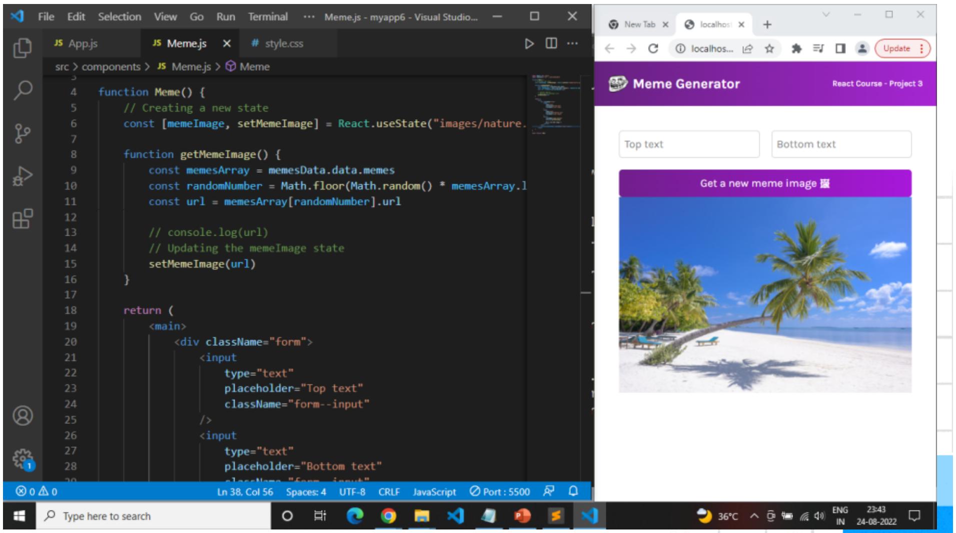
Add Image to Meme Generator


File Edit Selection View Go Run Terminal ··· Meme.js - myapp6 - Visual Studio...
App.js
Meme.js
style.css
src > components > Meme.js > Meme
Ln 38, Col 56 Spaces: 4 UTF-8 CRLF JavaScript Port : 5500
Type here to search
New Tab
localhost
localhos...
Update
Meme Generator
React Course - Project 3
Get a new meme image
36°C
ENG IN
23:43 24-08-2022

```
function Meme() {
    // Creating a new state
    const [memeImage, setMemeImage] = React.useState("images/nature.

    function getMemeImage() {
        const memesArray = memesData.data.memes
        const randomNumber = Math.floor(Math.random() * memesArray.l
        const url = memesArray[randomNumber].url

        // console.log(url)
        // Updating the memeImage state
        setMemeImage(url)
    }

    return (
        <main>
            <div className="form">
                <input
                    type="text"
                    placeholder="Top text"
                    className="form--input"
                />
                <input
                    type="text"
                    placeholder="Bottom text"
```

Top text

Bottom text

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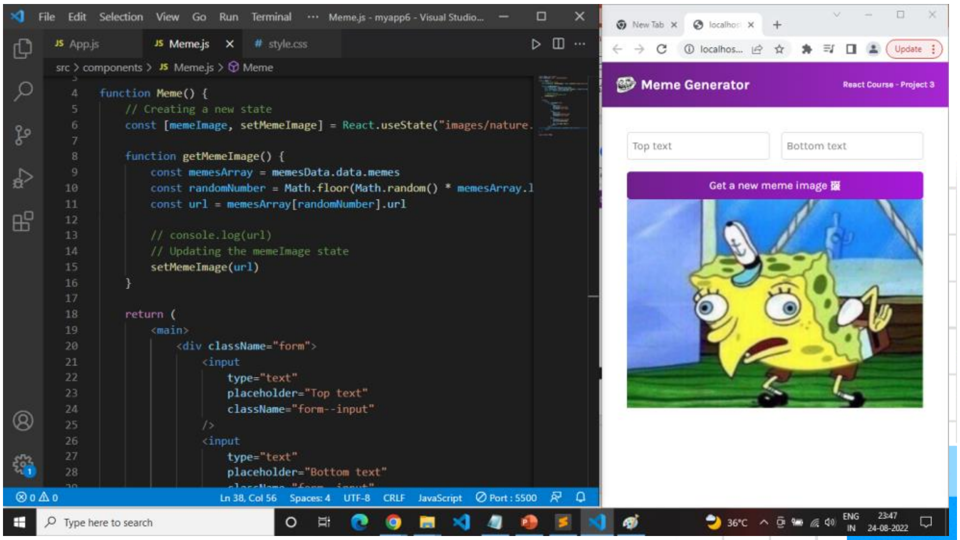
Add Image to Meme Generator



File Edit Selection View Go Run Terminal ··· Meme.js - myapp6 - Visual Studio...
App.js
Meme.js
style.css
src > components > Meme.js > Meme

```
function Meme() {
    // Creating a new state
    const [memeImage, setMemeImage] = React.useState("images/nature.

    function getMemeImage() {
        const memesArray = memesData.data.memes
        const randomNumber = Math.floor(Math.random() * memesArray.l
        const url = memesArray[randomNumber].url

        // console.log(url)
        // Updating the memeImage state
        setMemeImage(url)
    }

    return (
        <main>
            <div className="form">
                <input
                    type="text"
                    placeholder="Top text"
                    className="form--input"
                />
                <input
                    type="text"
                    placeholder="Bottom text"
```

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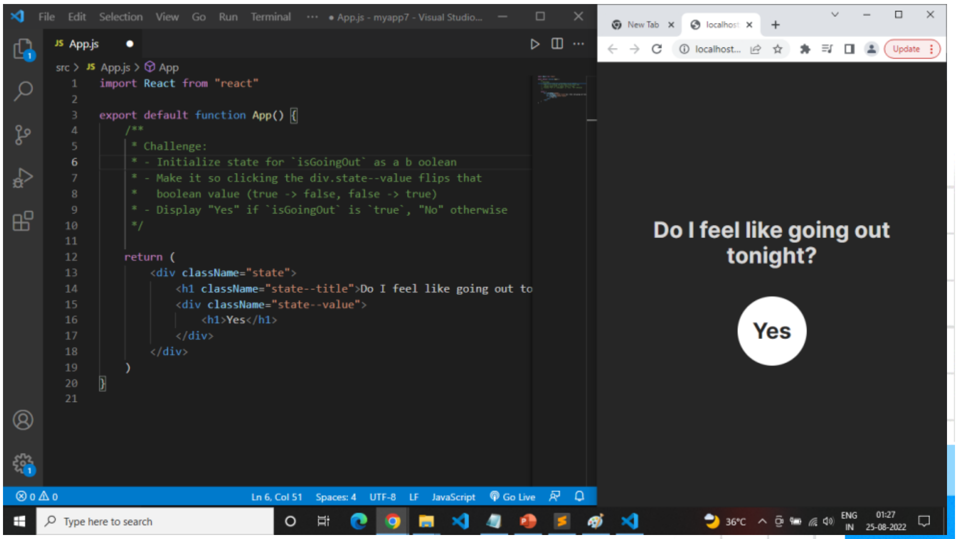
Example - useState



File Edit Selection View Go Run Terminal ··· • App.js - myapp7 - Visual Studio...
App.js
src > App.js > App

```
import React from "react"

export default function App() {
    /**
     * Challenge:
     * - Initialize state for `isGoingOut` as a b oolean
     * - Make it so clicking the div.state--value flips that
     *   boolean value (true -> false, false -> true)
     * - Display "Yes" if `isGoingOut` is `true`, "No" otherwise
     */

    return (
        <div className="state">
            <h1 className="state--title">Do I feel like going out to
            <div className="state--value">
                <h1>Yes</h1>
            </div>
        </div>
    )
}
```

Ln 6, Col 51 Spaces: 4 UTF-8 LF JavaScript Go Live
Type here to search
Do I feel like going out tonight?
Yes
36°C ENG IN 01:27 25-08-2022

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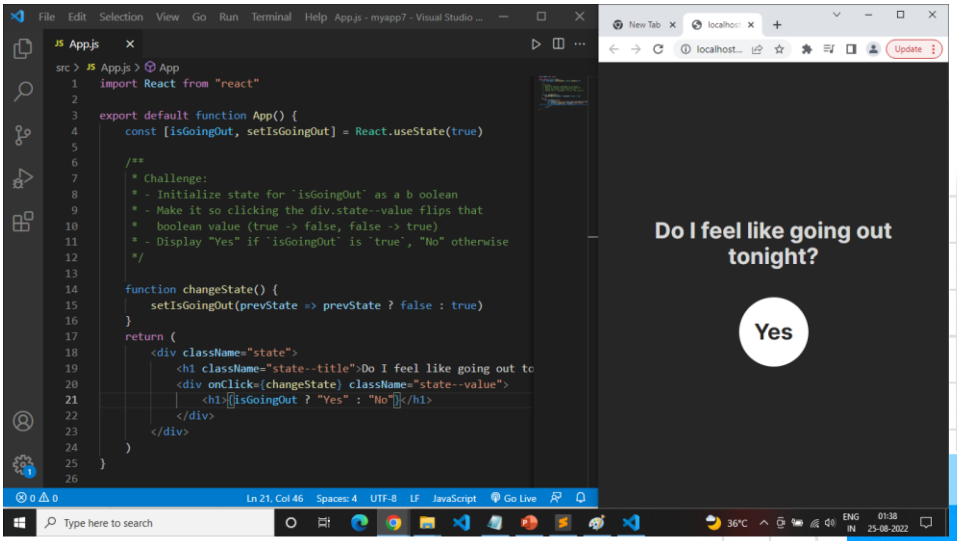
Flipping State



src > App.js > App

```
import React from "react"

export default function App() {
    const [isGoingOut, setIsGoingOut] = React.useState(true)

    /**
     * Challenge:
     * - Initialize state for `isGoingOut` as a b oolean
     * - Make it so clicking the div.state--value flips that
     *   boolean value (true -> false, false -> true)
     * - Display "Yes" if `isGoingOut` is `true`, "No" otherwise
     */

    function changeState() {
        setIsGoingOut(prevState => prevState ? false : true)
    }
    return (
        <div className="state">
            <h1 className="state--title">Do I feel like going out to
            <div onClick={changeState} className="state--value">
                <h1>{isGoingOut ? "Yes" : "No"}</h1>
            </div>
        </div>
    )
}
```

Do I feel like going out tonight?

Yes

File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
Ln 21, Col 46 Spaces: 4 UTF-8 LF JavaScript Go Live
New Tab
localhost
localhost...
Update
Type here to search
36°C
ENG IN
01:38
25-08-2022

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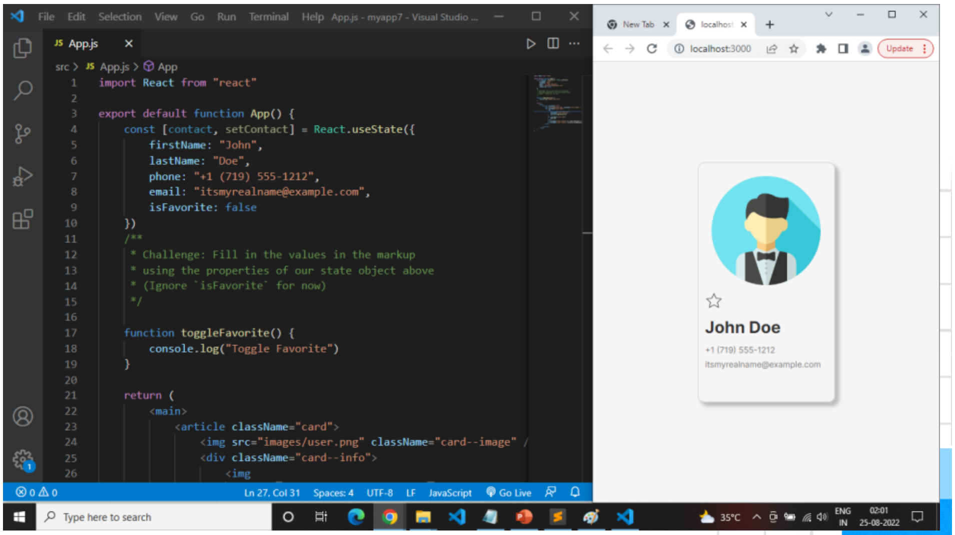
Complex State - Object



src > App.js > App

```
import React from "react"

export default function App() {
    const [contact, setContact] = React.useState({
        firstName: "John",
        lastName: "Doe",
        phone: "+1 (719) 555-1212",
        email: "itsmyrealname@example.com",
        isFavorite: false
    })
    /**
     * Challenge: Fill in the values in the markup
     * using the properties of our state object above
     * (Ignore `isFavorite` for now)
     */

    function toggleFavorite() {
        console.log("Toggle Favorite")
    }

    return (
        <main>
            <article className="card">
                <img src="images/user.png" className="card--image" /
                <div className="card--info">
                    <img
```

John Doe

+1 (719) 555-1212

itsmyrealname@example.com

File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
Ln 27, Col 31 Spaces: 4 UTF-8 LF JavaScript Go Live
New Tab
localhost
localhost:3000
Update
Type here to search
35°C
ENG IN
02:01
25-08-2022

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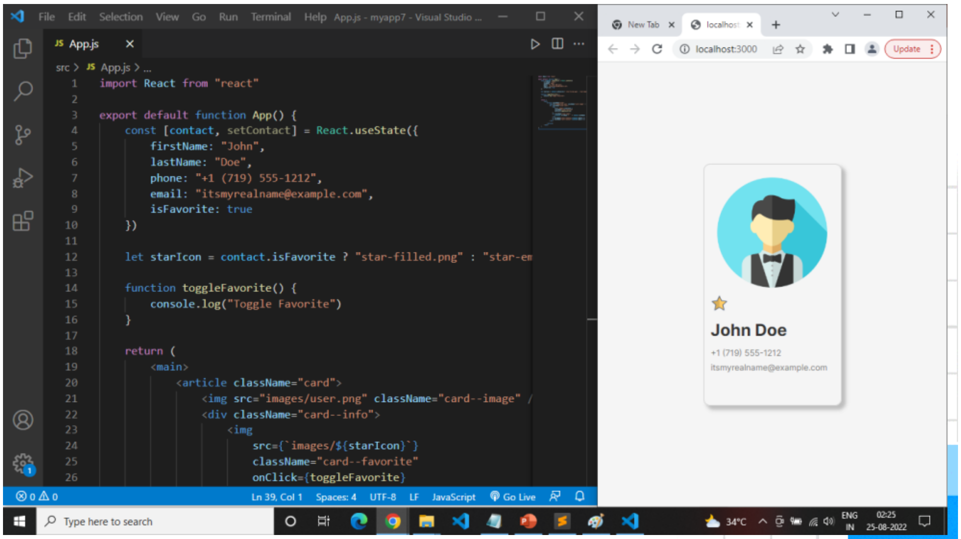
Complex State - Object



```
import React from "react"

export default function App() {
    const [contact, setContact] = React.useState({
        firstName: "John",
        lastName: "Doe",
        phone: "+1 (719) 555-1212",
        email: "itsmyrealname@example.com",
        isFavorite: true
    })

    let starIcon = contact.isFavorite ? "star-filled.png" : "star-em

    function toggleFavorite() {
        console.log("Toggle Favorite")
    }

    return (
        <main>
            <article className="card">
                <img src="images/user.png" className="card--image" /
                <div className="card--info">
                    <img
                        src={`images/${starIcon}`}
                        className="card--favorite"
                        onClick={toggleFavorite}
```

John Doe

+1 (719) 555-1212

itsmyrealname@example.com

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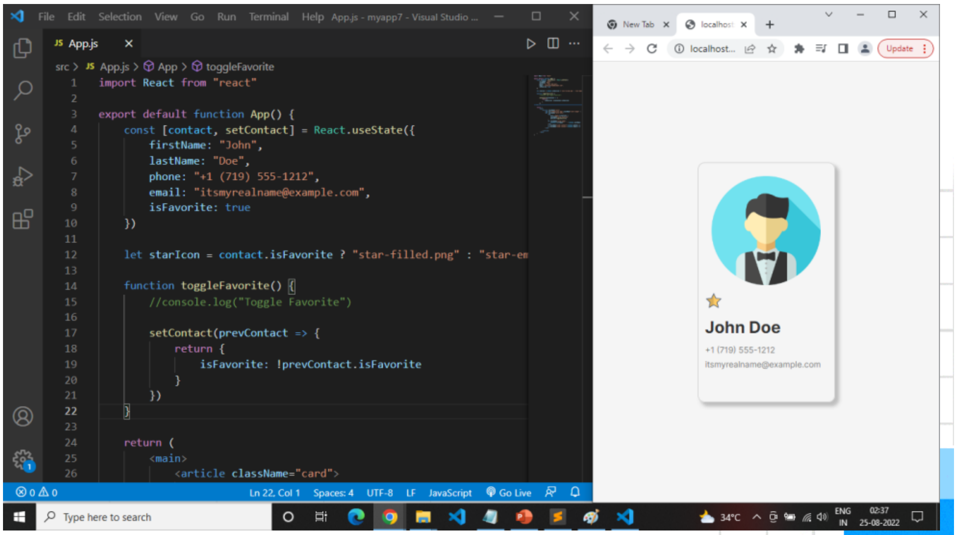
Complex State - Object



```
import React from "react"

export default function App() {
    const [contact, setContact] = React.useState({
        firstName: "John",
        lastName: "Doe",
        phone: "+1 (719) 555-1212",
        email: "itsmyrealname@example.com",
        isFavorite: true
    })

    let starIcon = contact.isFavorite ? "star-filled.png" : "star-em

    function toggleFavorite() {
        //console.log("Toggle Favorite")

        setContact(prevContact => {
            return {
                isFavorite: !prevContact.isFavorite
            }
        })
    }

    return (
        <main>
            <article className="card">
```

John Doe

+1 (719) 555-1212

itsmyrealname@example.com

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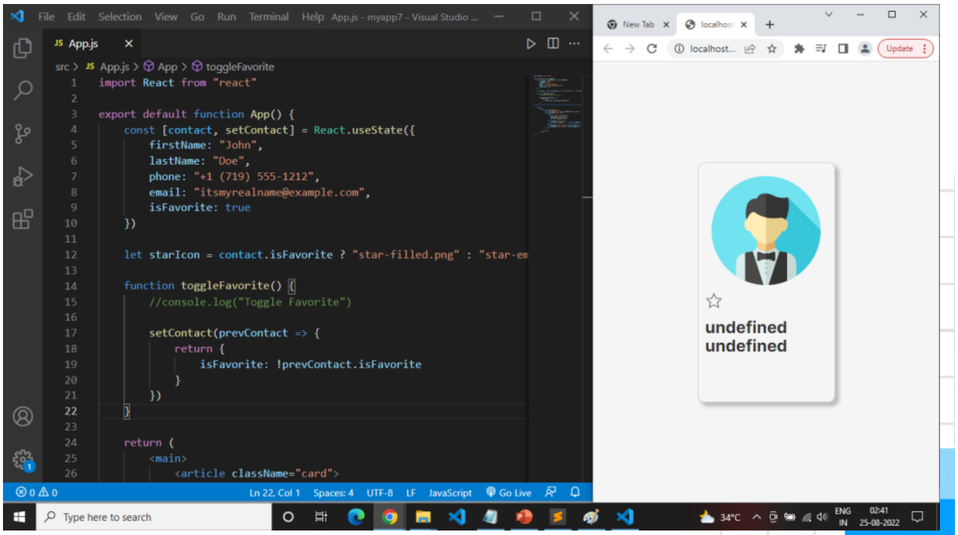
Complex State - Object



File Edit Selection View Go Run Terminal Help App.js - myapp7 - Visual Studio ...
App.js
src > App.js > App > toggleFavorite
New Tab
localhost
localhost...
Update

```
import React from "react"

export default function App() {
    const [contact, setContact] = React.useState({
        firstName: "John",
        lastName: "Doe",
        phone: "+1 (719) 555-1212",
        email: "itsmyrealname@example.com",
        isFavorite: true
    })

    let starIcon = contact.isFavorite ? "star-filled.png" : "star-em

    function toggleFavorite() {
        //console.log("Toggle Favorite")

        setContact(prevContact => {
            return {
                isFavorite: !prevContact.isFavorite
            }
        })
    }

    return (
        <main>
            <article className="card">
```

undefined
undefined

⊗ 0 ⚠ 0 Ln 22, Col 1 Spaces: 4 UTF-8 LF JavaScript Go Live
Type here to search
34°C ENG IN 02:41 25-08-2022

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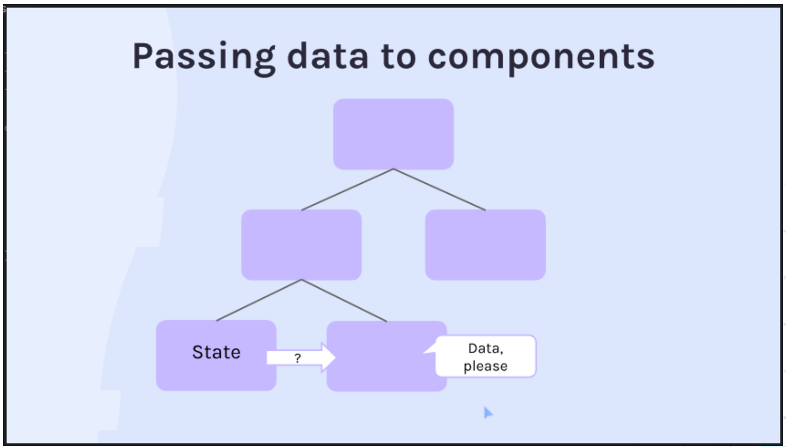
Passing Data to Components

- High-Level look at how data is passed to components.



Passing data to components

- There is parent-child relationship between these components

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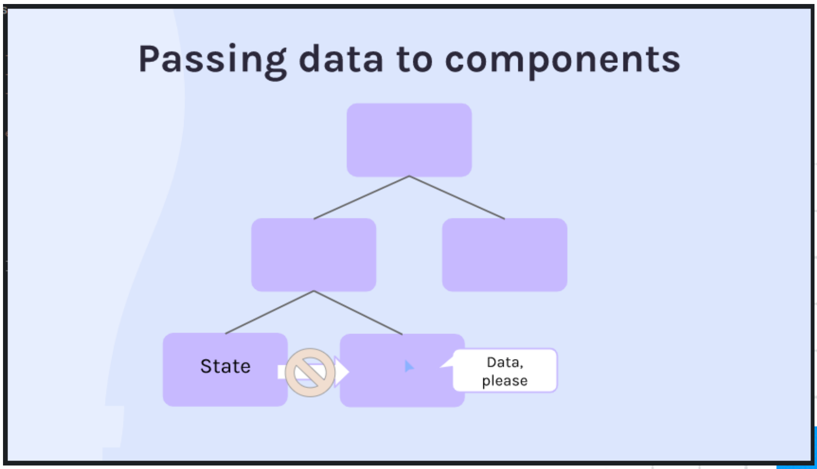
Passing Data to Components

- High-Level look at how data is passed to components.



Passing data to components

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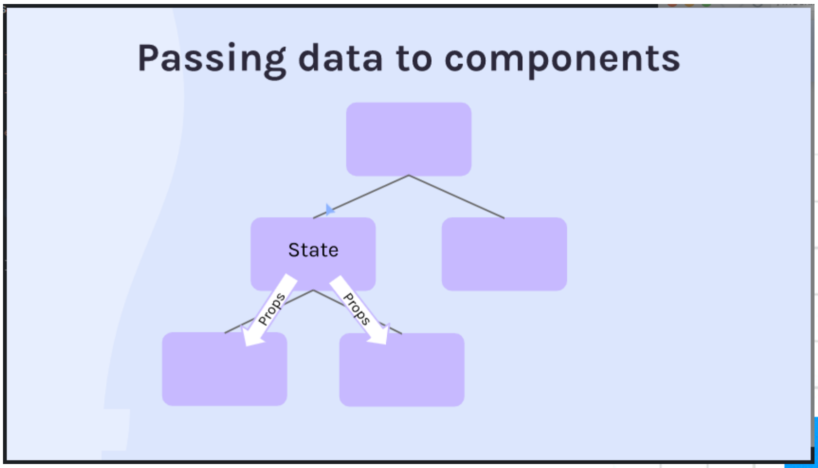
Passing Data to Components

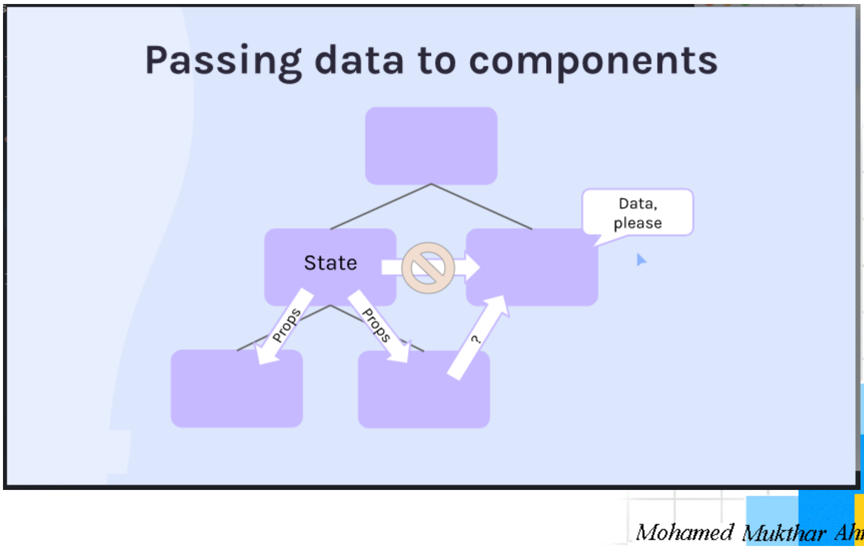
- High-Level look at how data is passed to components.



Passing data to components

Passing Data to Components

- High-Level look at how data is passed to components.



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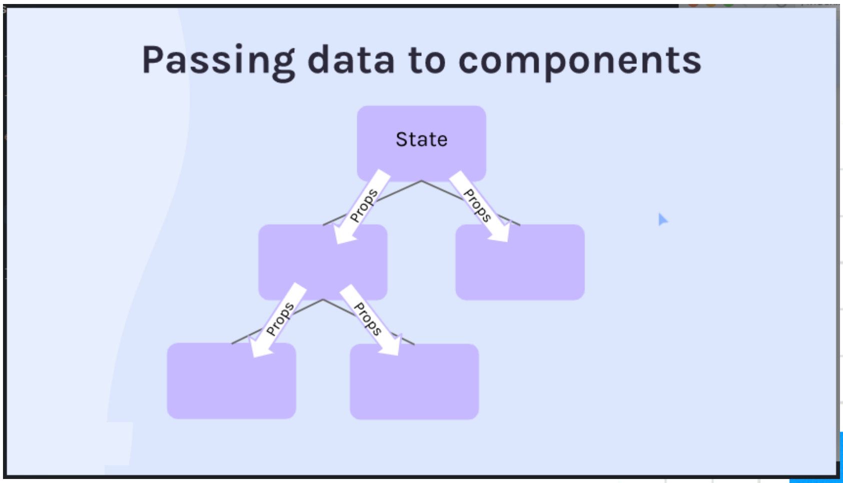
Passing data to components

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Issues & Solution

- Over time this can get very tedious
- Specially when our app raises up multiple-levels
- Solution
  - Context
  - Third-Party State Management - Redox
- Beyond the scope of this course to discuss

- Rule of thumb – Keep state as local as you can.

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