Class 10: Handler Props & Controlled Inputs

- Review: Last Class
- Handler Props
- Controlled Inputs
- React Developer Tools

Review

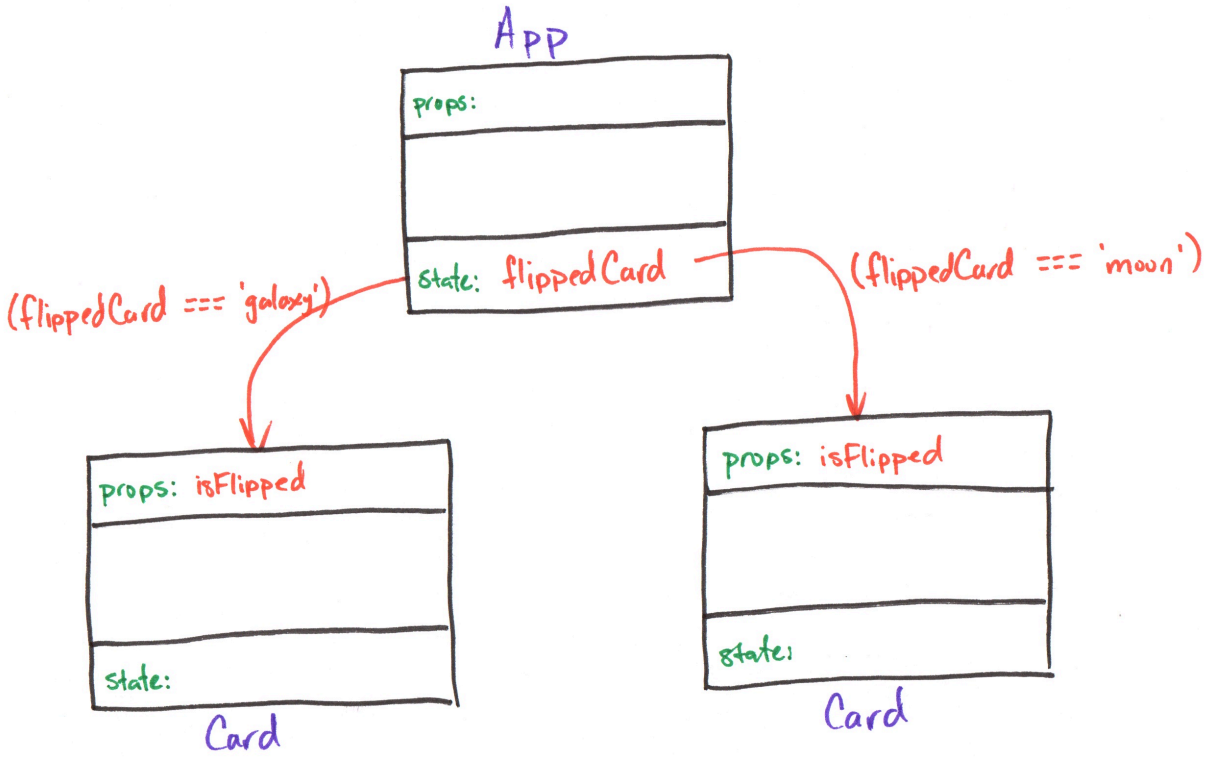
Review: A Single Source of Truth

When **multiple components** need to **share state**, we need to **lift the state up** to their **closest common ancestor**.

When we lift state up, we move the **state variable** and the **state update function** to the **closest common ancestor** of the components that need to **share the state**.

Review: Component Tree

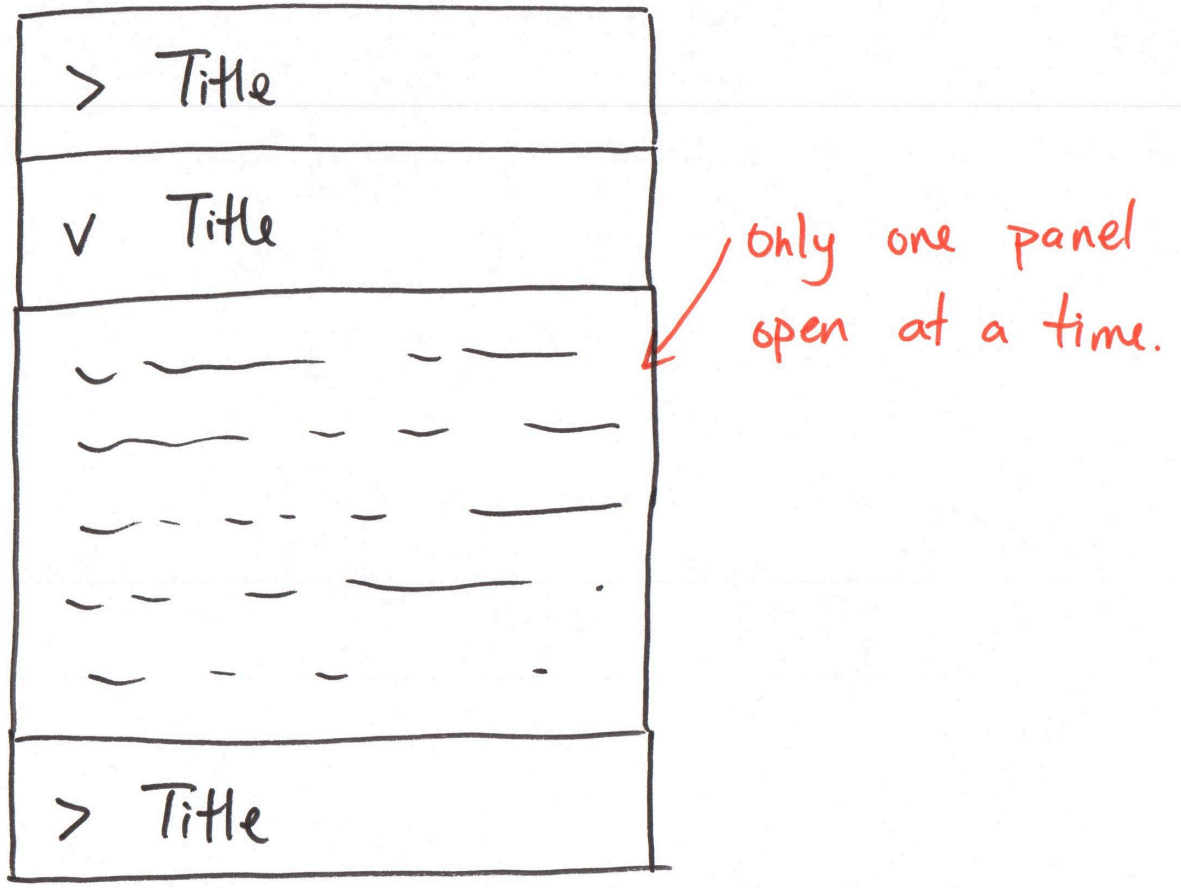
A diagram to visualize the component hierarchy and the flow of data (props) and state.



Activity: Accordion Component Tree

Working with your peers (2-4):

Draw the component diagram on the handout with **lifted state** so that only **one panel** can be expanded at a time.



Review: Lifted State

App

```
export default function App() {
  const [flippedCard, setFlippedCard] = useState('null')
  return (
    <div className="gallery">
      <Card
        imgUri="/images/galaxy.webp"
        altText="galaxy"
        isFlipped={flippedCard === 'galaxy'}
      />
      <Card
        imgUri="/images/asteroid.webp"
        altText="asteroid"
        isFlipped={flippedCard === 'asteroid'}
      />
    </div>
  )
}
```

Card

```
export default function Card({ imgUri, altText, isFlipped }) {
  return (
    <div className="card">
      <button aria-label="flip card">
        <img src="/icons/flip.svg" />
      </button>

      {!isFlipped && <img src={imgUri} alt={altText} />}
      {!!isFlipped && <>
        {!!caption && <Caption text={caption} />}
        {!!citation && <Citation citation={citation} />}
      </>}
    </div>
  )
}
```

Activity: Accordion Lifted State

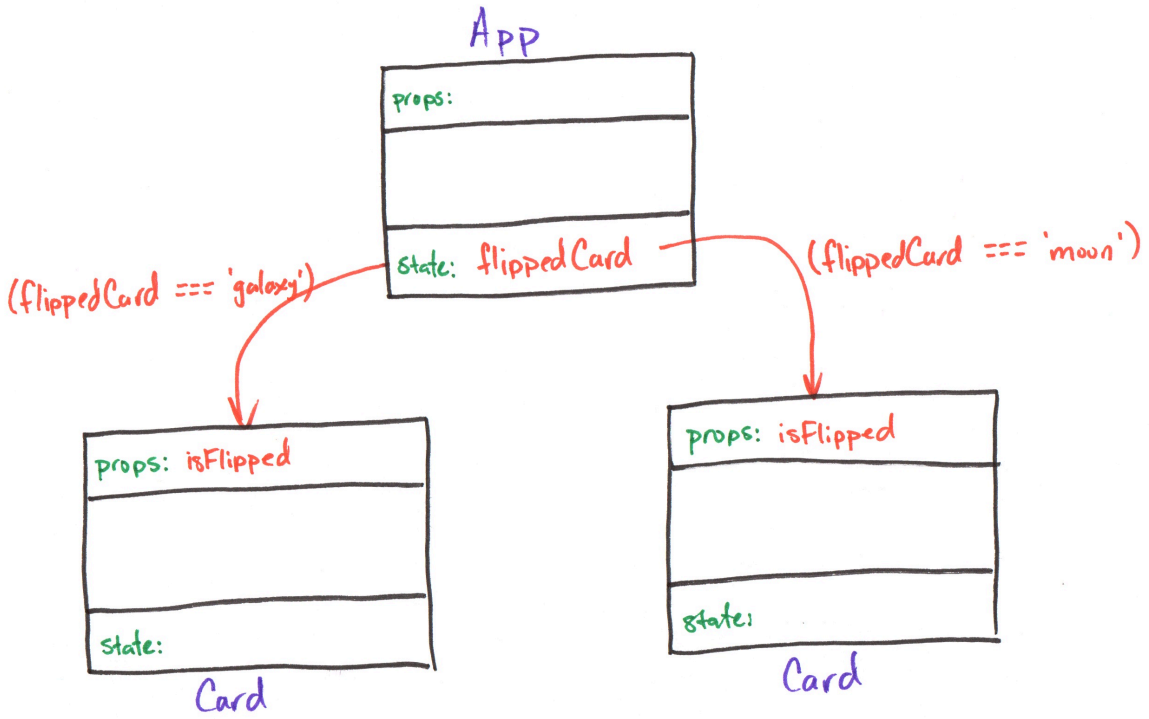
Working with your peers (2-4), code the `Accordion` and `AccordionItem` components with lifted state so that only one panel can be expanded at a time.

Gotcha: Remove event handlers from the `AccordionItem` components *for now*.

"Handler" Props

Discussion: Child to Parent Communication

Each `Card` has a **flip button**. How do we flip the card, when the state is lifted up to the `App` component?



Review: Event Handlers

`onClick` is a **prop**.

`function handleClick()` is a **function declaration**.

`handleClick` is passed as a **function reference** to the `onClick` prop.

When the `<button>` is clicked, it calls `handleClick()`.

```
export default function Component() {
  function handleClick() {
    console.log('clicked')
  }

  return (
    <button onClick={handleClick}>
      Click Me
    </button>
  )
}
```

“Handler” Props

A component provides **prop** that accepts a **function reference** as a value.

When the component needs to trigger an event, it calls the function reference passed as a prop.

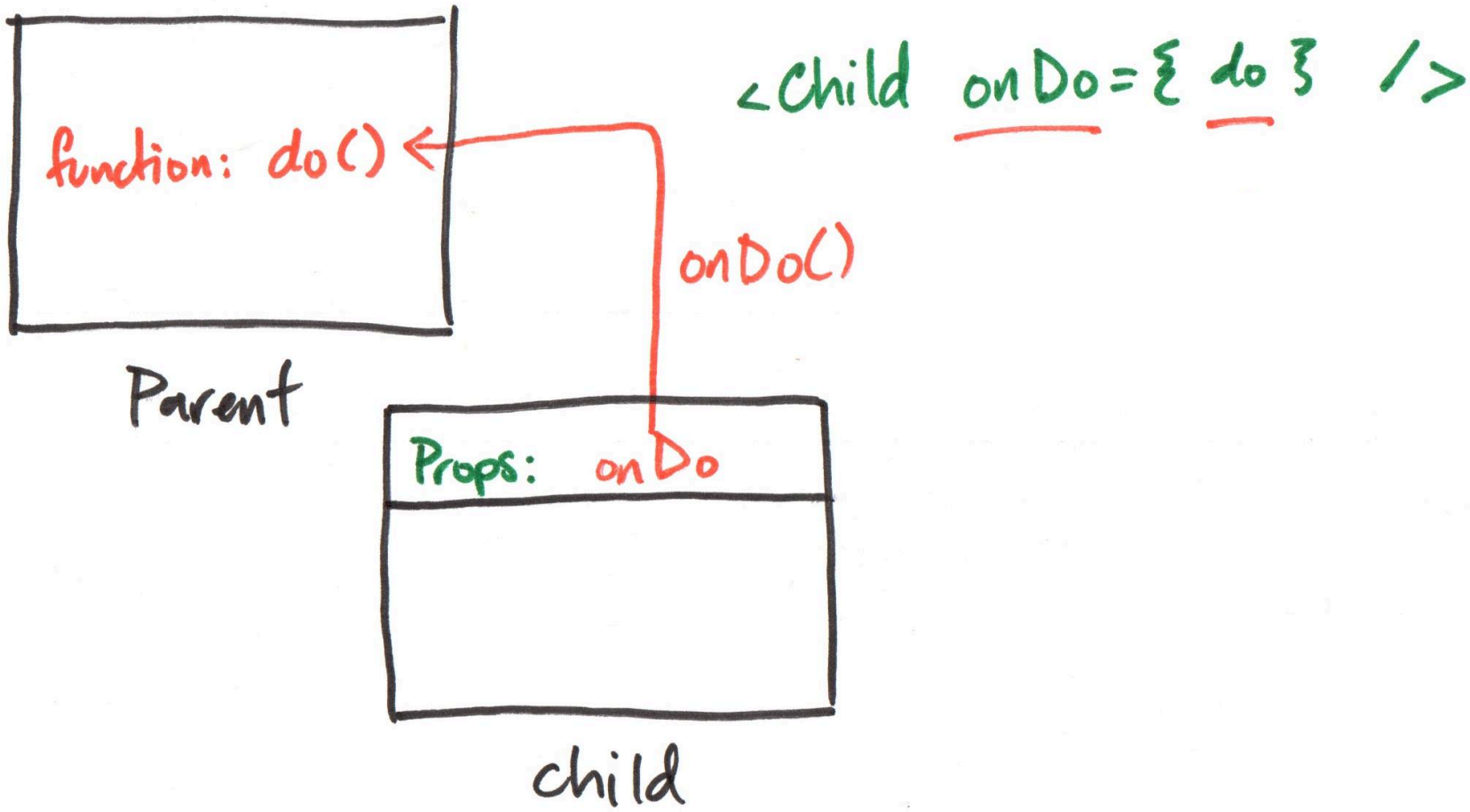
Props

Send data **into** a component from the parent.

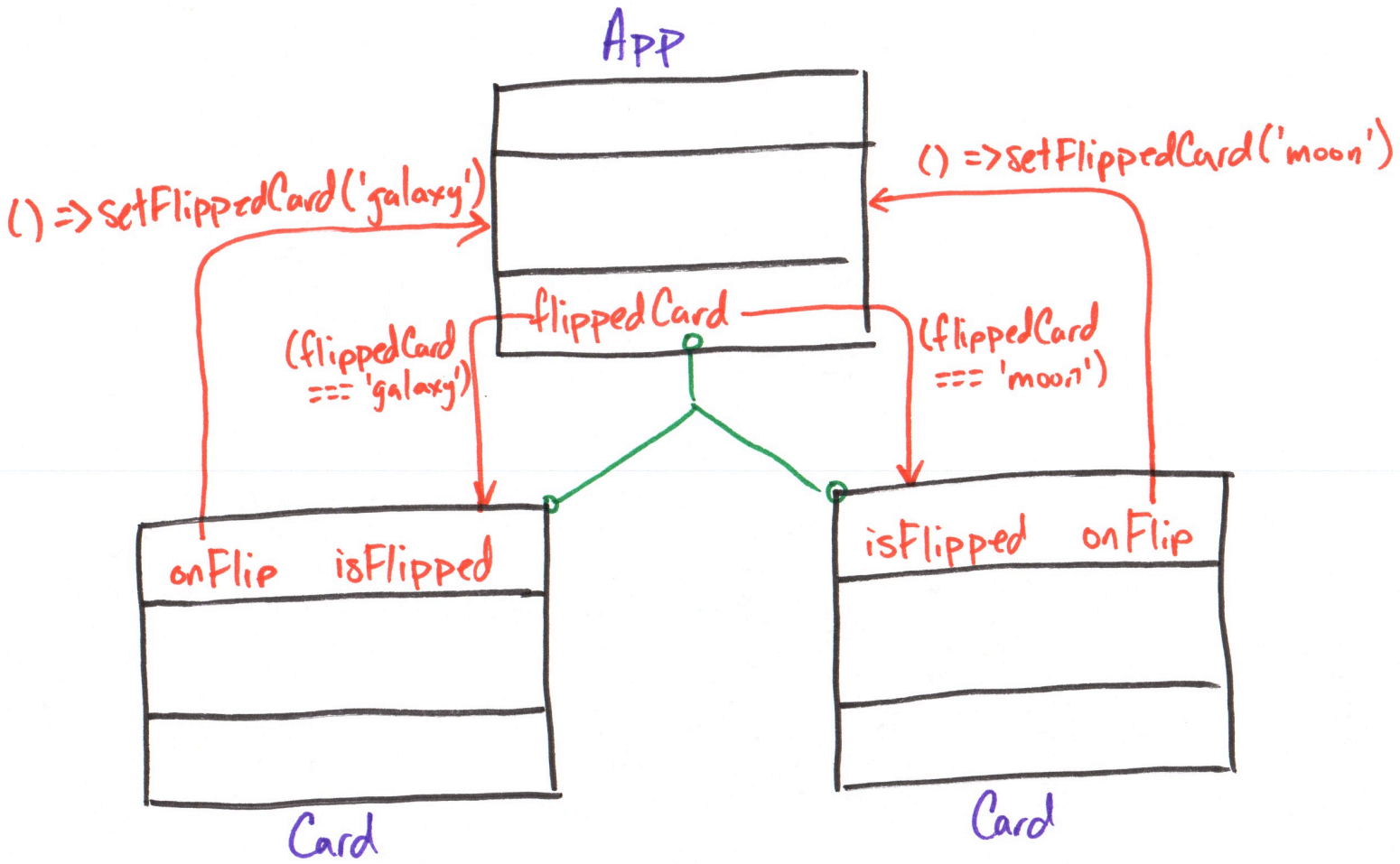
“Handler” Props

Send data **out** a component to the parent component!

Component Tree: Handler Prop



Example: Handler Prop



Demo: Handler Prop

App

```
export default function App() {
  const [flippedCard, setFlippedCard] = useState('null')
  return (
    <div className="gallery">
      <Card
        imgUri="/images/galaxy.webp"
        altText="galaxy"
        isFlipped={flippedCard === 'galaxy'}
        onFlip={(isFlipped) =>
          setFlippedCard(isFlipped ? 'galaxy' : null)}
      />
      <Card
        imgUri="/images/asteroid.webp"
        altText="asteroid"
        isFlipped={flippedCard === 'asteroid'}
        onFlip={(isFlipped) =>
          setFlippedCard(isFlipped ? 'asteroid' : null)}
      />
    </div>
  )
}
```

Card

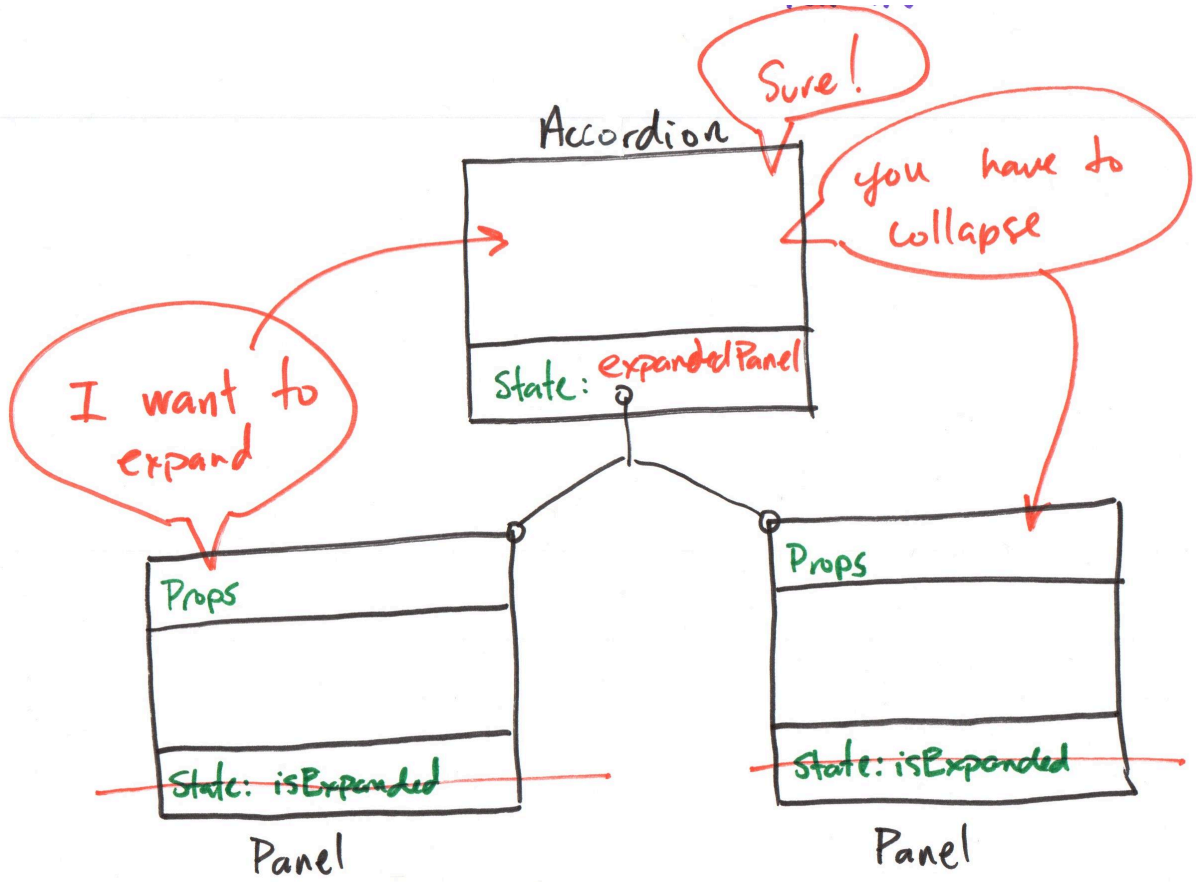
```
export default function Card({ imgUri, altText,
  isFlipped, onFlip }) {
  return (
    <div className="card">
      <button aria-label="flip card"
        onClick={() => onFlip(!isFlipped)}>
        <img src="/icons/flip.svg" />
      </button>

      {!isFlipped && <img src={imgUri} alt={altText} />}
      {!!isFlipped && <>
        {!!caption && <Caption text={caption} />}
        {!!citation && <Citation citation={citation} />}
      </>}
    </div>
  )
}
```

Activity: Accordion Handler Prop

Working with your peers (2-4), add a handler prop to the `AccordionItem` component so that when a panel is clicked, it notifies the `Accordion` component to update the expanded panel state in the **component tree** on your **handout**.

Then, update the code.

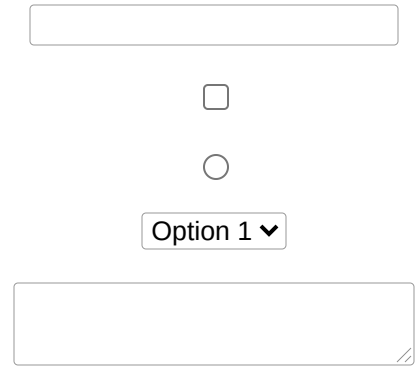


Controlled Inputs

HTML Input Elements

Input elements collect data from the user.

```
<input type="text" />
<input type="checkbox" />
<input type="radio" />
<select>
  <option value="option1">Option 1</option>
  <option value="option2">Option 2</option>
</select>
<textarea></textarea>
```



See the HTML reference documentation for more input types, like color pickers and date pickers.

Controlled Input

How do we set the value of input elements in React? How do we read the value of input elements in React?

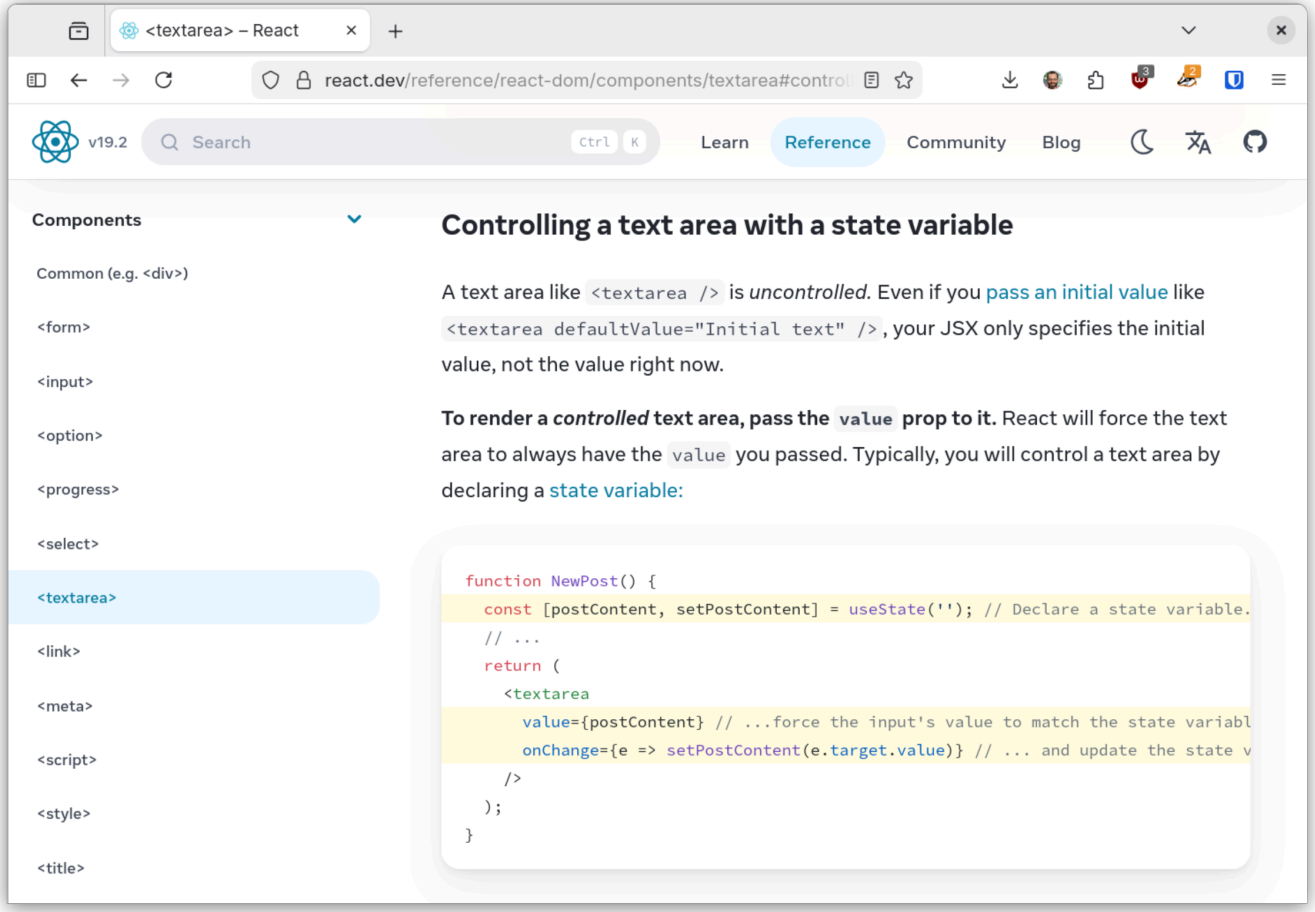
A **controlled input** is an input element that has its value controlled by React state. (This is also known as **data binding**.)

The input's value is set to a state variable. When the input's value is changed, its value is reflected in the state.

Controlling an Input Element

1. Add an input element to your component.
2. Create a state variable to hold the input's value.
3. Set the value of the input element to the state variable using an appropriate prop (e.g. `value` for text inputs, `checked` for checkboxes).
4. Update the state variable when the input's value changes using an event handler (e.g. `onChange`).

Tip: Use the Reference Documentation



Example:

```
const [termsAccepted, setTermsAccepted] = useState(false)

return (
  <label>
    <input type="checkbox"
      checked={termsAccepted}
      onChange={(e) => setTermsAccepted(e.target.checked)}
    />
    Accept terms and conditions
  </label>
)
```

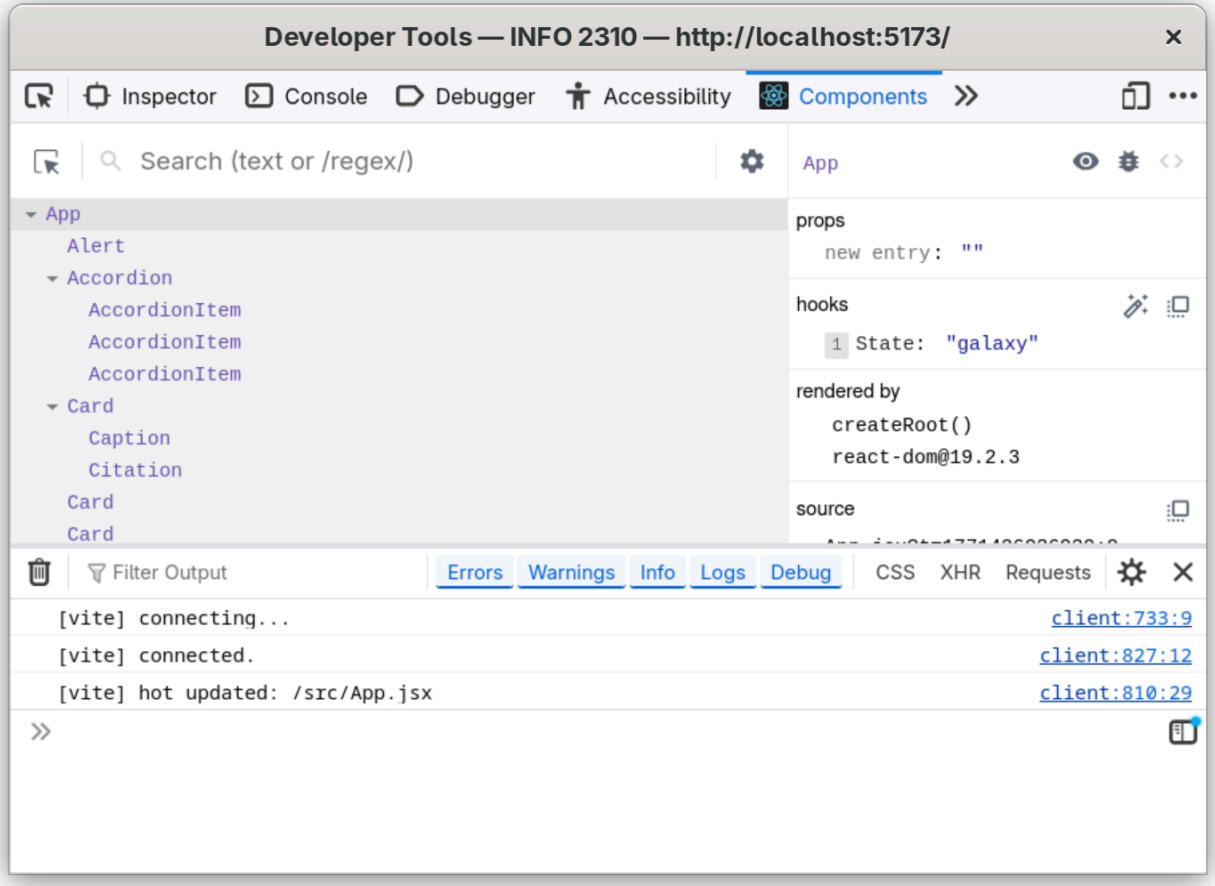
React Developer Tools

React Developer Tools

A browser extension that allows you to inspect the React component tree, view props and state, and debug your React applications.

Install: https://react.dev/learn/react-developer-tools

Demo: Check the State



Activity: Controlled `<textarea>`

Working with your peers (2-4), create a controlled `<textarea>` component that allows the user to enter their bio in `App`.

Check that the state updates correctly using React Developer Tools.

Hint: Use the React documentation for `<textarea>`.

Summary

- When multiple components need to share state, lift the state up to their closest common ancestor.
- A component can provide a “handler” prop that accepts a function reference as a value.
- A controlled input is an input element that has its value controlled by React state.
- React Developer Tools is a browser extension that allows you to inspect the React component tree, view props and state, and debug your React applications.

What's Next

Friday: Practice Problem Workshop (Lifted State & Controlled Inputs)

Monday: Project 1, Milestone 3 due