Class 8: Lifting State Up

- Review: Last Class
- Exam I
- A Single Source of Truth
- Planning with Component Trees
- Lifting State Up
- React Developer Tools

Review

Review: Variables Do Not Persist

A component is only rendered when its function is called (`Alert("")`), and it returns the JSX (HTML).

```
export default function Alert({ message }) {
  let isDismissed = false

  return (!isDismissed &&
    <div className="alert" role="alert">
      <h3>{message}</h3>
      <button type="button" onClick={() => isDismissed = true}>X</button>
    </div>)
}
```

The event handler updates the `isDismissed` variable, but this does not cause the component to re-render (the `Alert()` function must be called to re-render), so the alert is not dismissed when the button is clicked.

State

State provides a **memory** for components. `useState()` creates a state variable (`count`) and a function to update that variable (`setCount`).

```
import { useState } from "react"

export default function ComponentName() {
  const [count, setCount] = useState(0)
  ...
}
```

When `setCount` is called, it updates the value of `count` and triggers a re-render of the component.

Review: State Update Function

Use the update function to change the value of a state.

```
const [count, setCount] = useState(0)
```

No!

```
count = count + 1
```

Yes!

```
setCount(count + 1)
```

Review: State Update with Updater Function

When you need to update state based on the previous state value, use the updater function form of the state update function.

```
const [count, setCount] = useState(0) // count is 0
console.log(count) // count is 0

setCount(prevCount => prevCount + 1) // count is 0, prevCount is 0
setCount(prevCount => prevCount + 1) // count is 0, prevCount is 1
setCount(prevCount => prevCount + 1) // count is 0, prevCount is 2
```

```
console.log(count) // count is still 0, not 3
// count will be 3 on the next render
```

Exam I

Exam I

Exam 1 is this upcoming **Monday, February 23rd, 2026**, during our **regularly scheduled class time (10:10am - 11:25am; 75 minutes)**.

Covers classes 1-7, project 1 milestone 1 & 2, homeworks 1 & 2, and practice problem workshops 1+2 & 3.

Paper-based, closed-book, no computers or electronic devices allowed. 10-15 questions, same format as part I of the practice problem workshops.

Exam I: Study Guide

- **Class 1:** Introduction & Single-Page Applications
- **Class 2:** Single-Page Applications & Components
- **Class 3:** JavaScript Modules & Objects
- **Class 4:** Expression Placeholders & Props
- **Class 5:** Conditional Rendering
- **Class 6:** Event Handling
- **Class 7:** State

Practice Problem Workshop (2/20/2026)

Exam I Practice & Study Session (No Part I or Part II)

You will work in groups to answer the group created practice problems created during the last two workshops (workshop 1+2 and workshop 3).

If you have questions, the course assistant will be available to help.

Q & A: Exam I

Covers classes 1-7, project 1 milestone 1 & 2, homeworks 1 & 2, and practice problem workshops 1+2 & 3.

Paper-based, closed-book, no computers or electronic devices allowed. 10-15 questions, same format as part I of the practice problem workshops.

`</Exam I>`

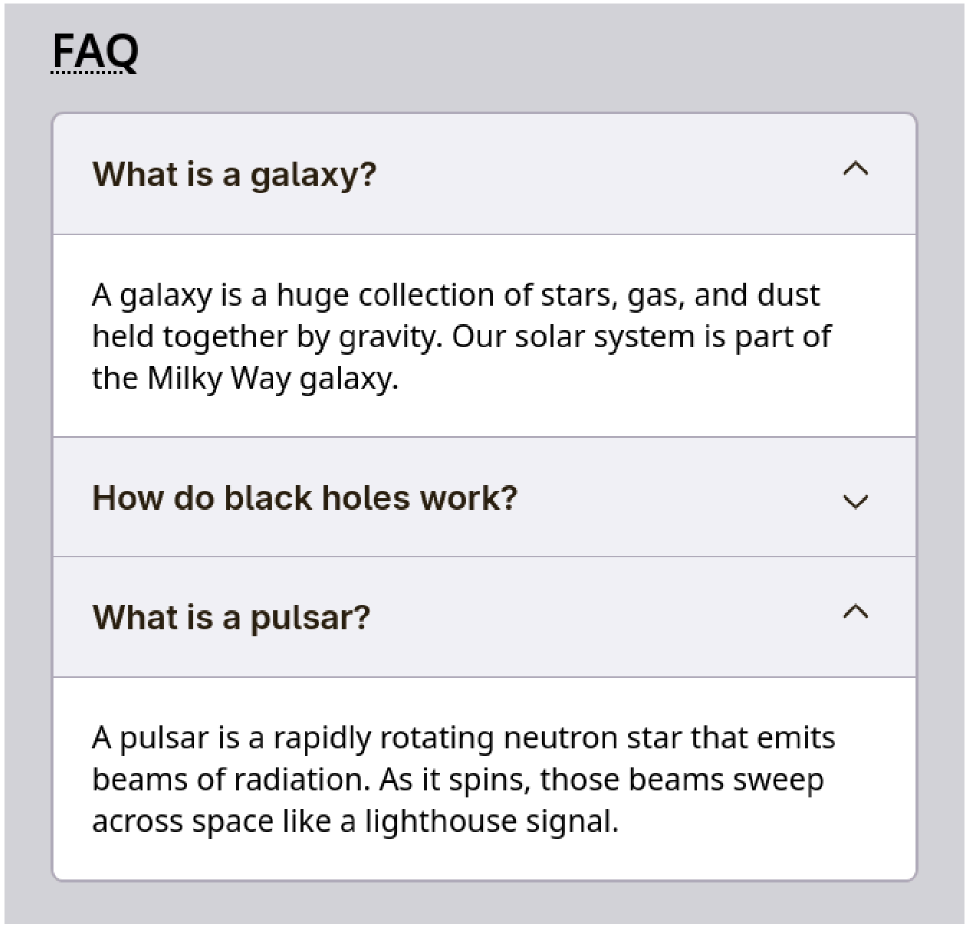
`<Exam II>`

A Single Source of Truth

Activity: Where's the State?

Working with your peers (2-4):

- Review the code for the `Accordion` component.
- How does the `Accordion` component know which section is expanded?
- Where is the state for the expanded section stored?



FAQ

What is a galaxy?

A galaxy is a huge collection of stars, gas, and dust held together by gravity. Our solar system is part of the Milky Way galaxy.

How do black holes work?

What is a pulsar?

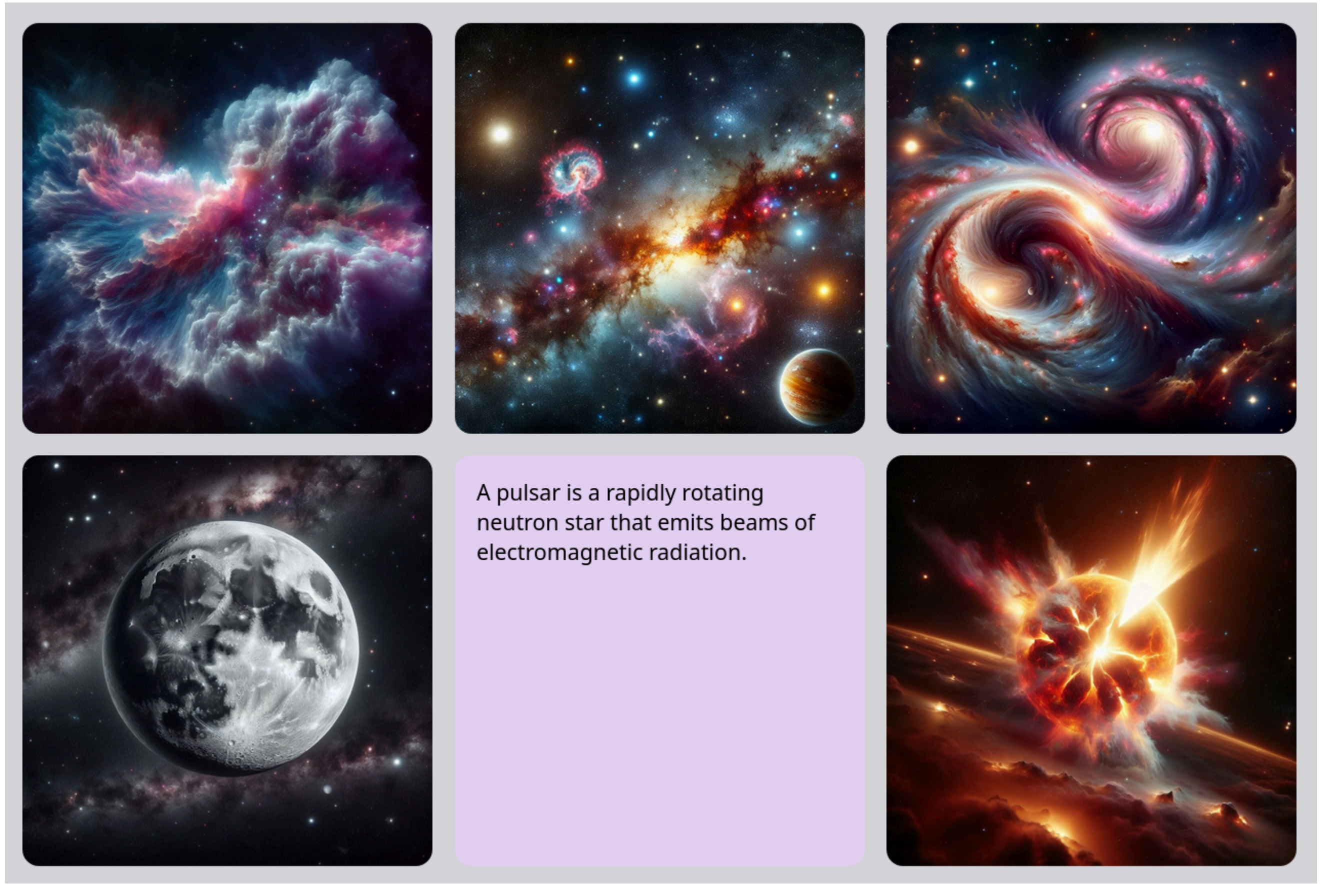
A pulsar is a rapidly rotating neutron star that emits beams of radiation. As it spins, those beams sweep across space like a lighthouse signal.

A Single Source of Truth: Lifting State Up

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**.

Demo: Only Flip One Card

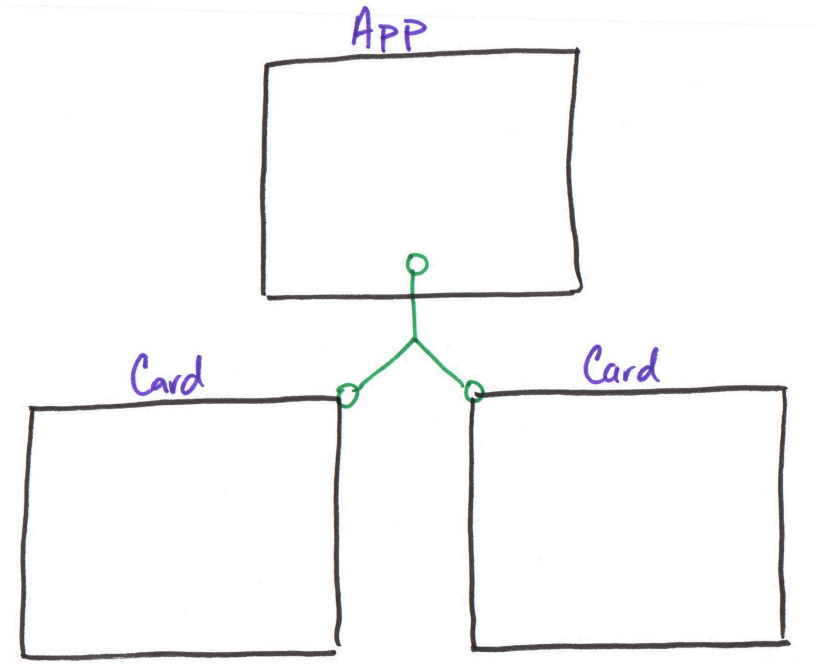


A pulsar is a rapidly rotating neutron star that emits beams of electromagnetic radiation.

Planning Components with Component Trees

Component Tree

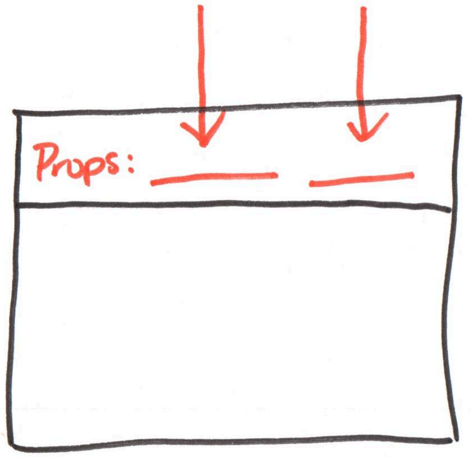
A diagram to visualize the component hierarchy and the flow of data (props) and state.



`App` has 10 `Card` children (only 2 shown here).

Component Tree: **Props**

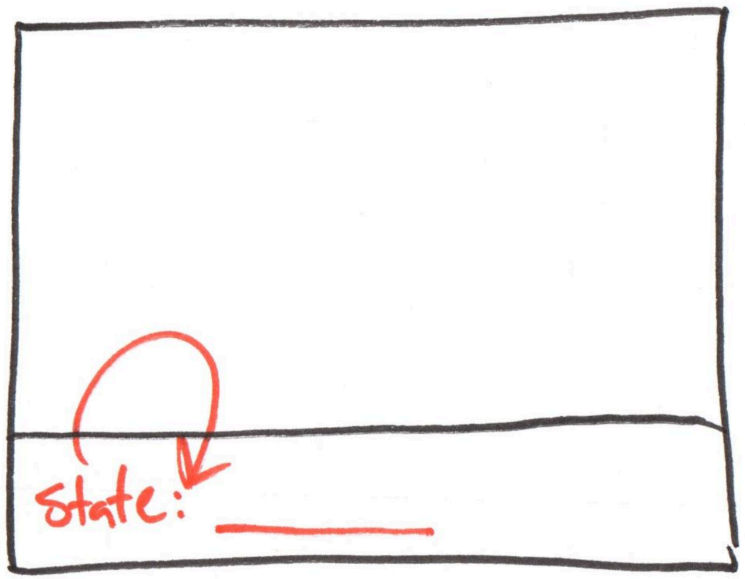
Props are passed **down** the component tree from parent to child. (i.e. Send data from the parent to the child)



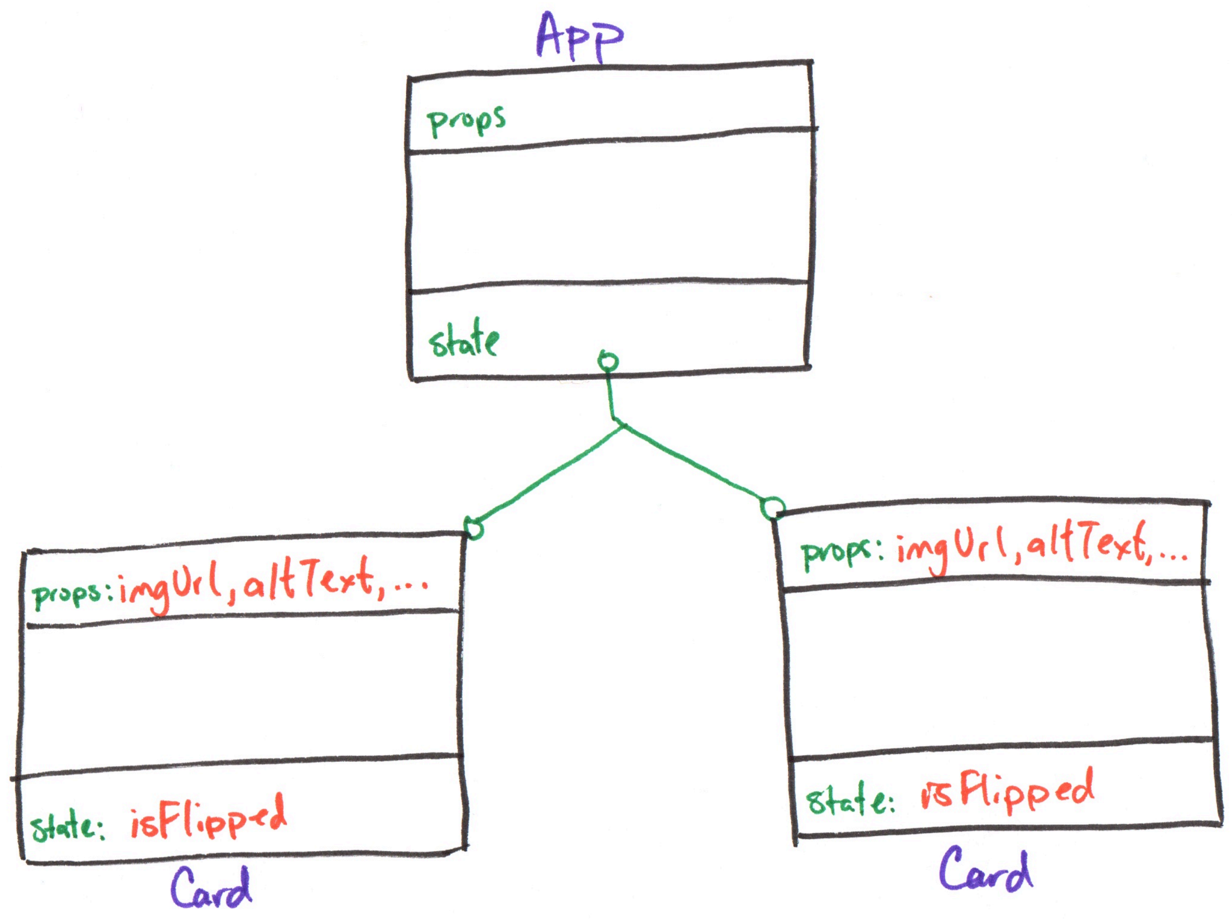
Review: Props are **read-only**. A component cannot change its props.

Component Tree: State

State is stored inside a component, and it can only be updated by that component. (i.e. State is private to the component)



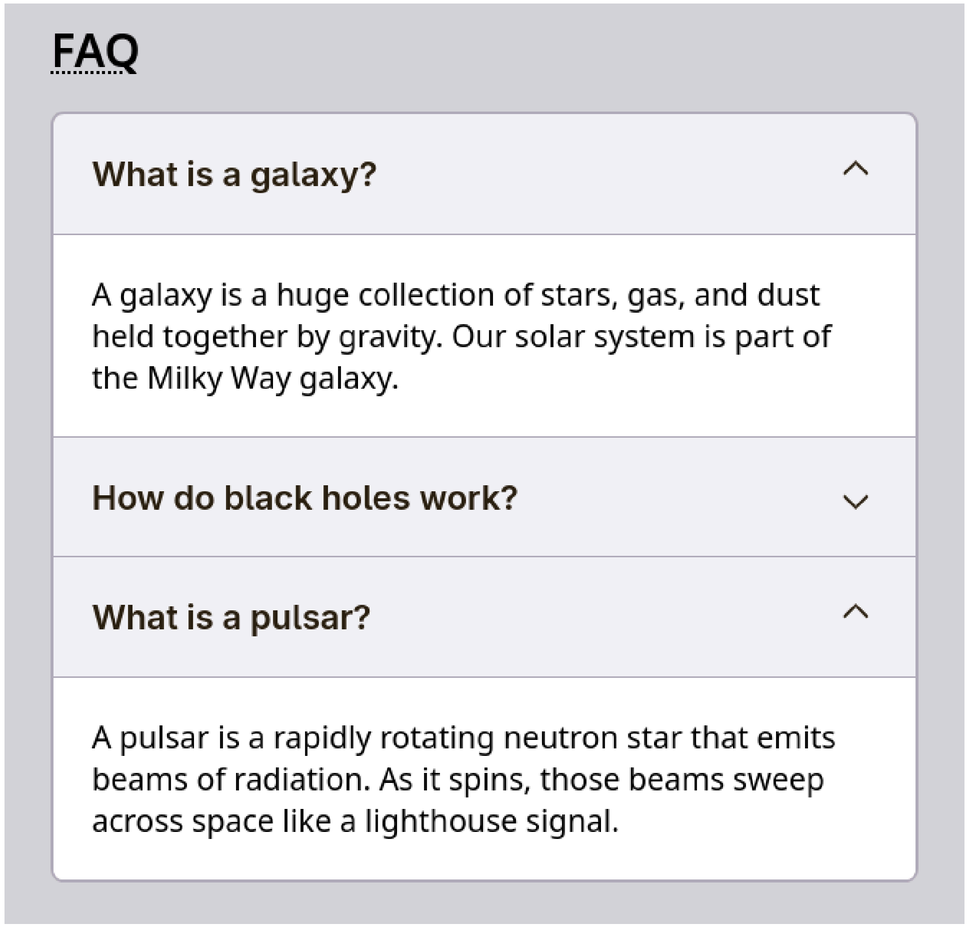
Example: Component Tree



Activity: Component Tree

Working with your peers (2-4), complete items **1, 2, and 3** on the handout.

You need not include all 3 `AccordionItems` in your component tree diagram, but you should include at least 2.



FAQ

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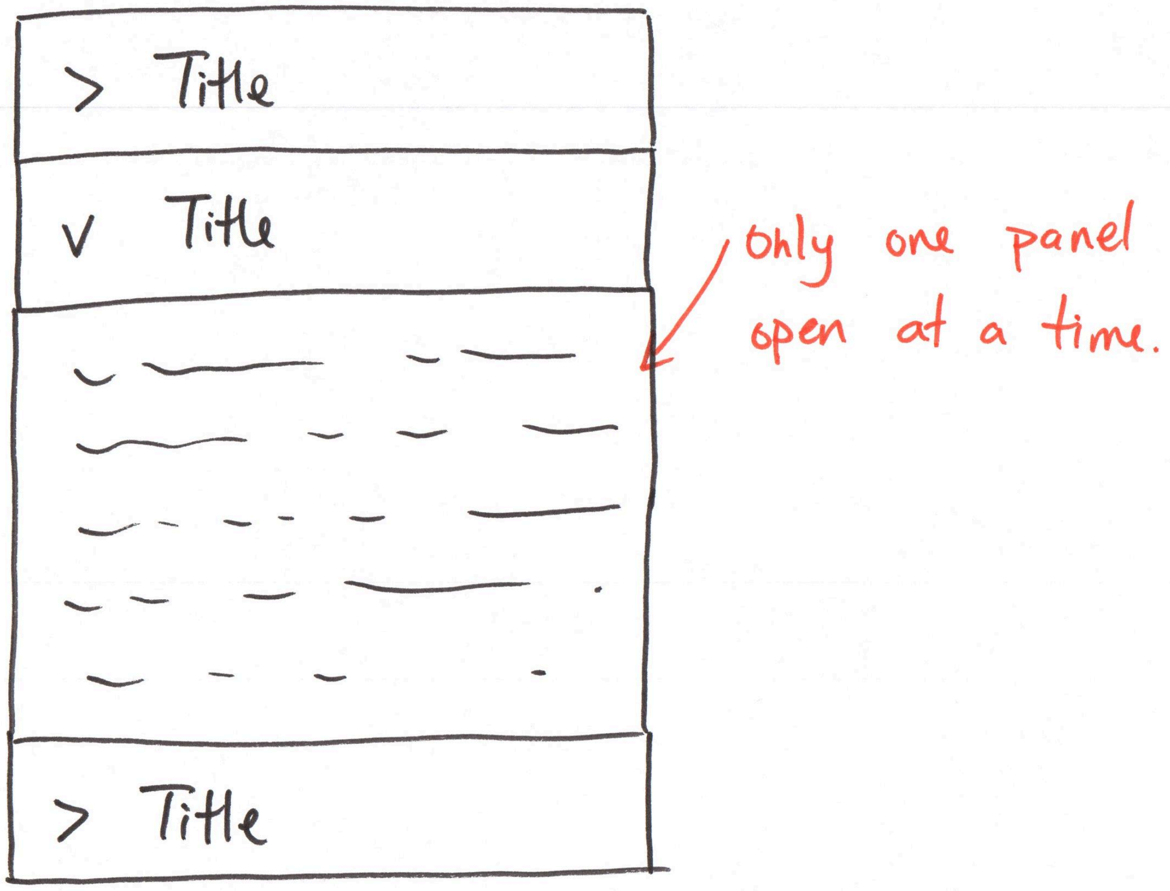
Discussion: Only One Panel

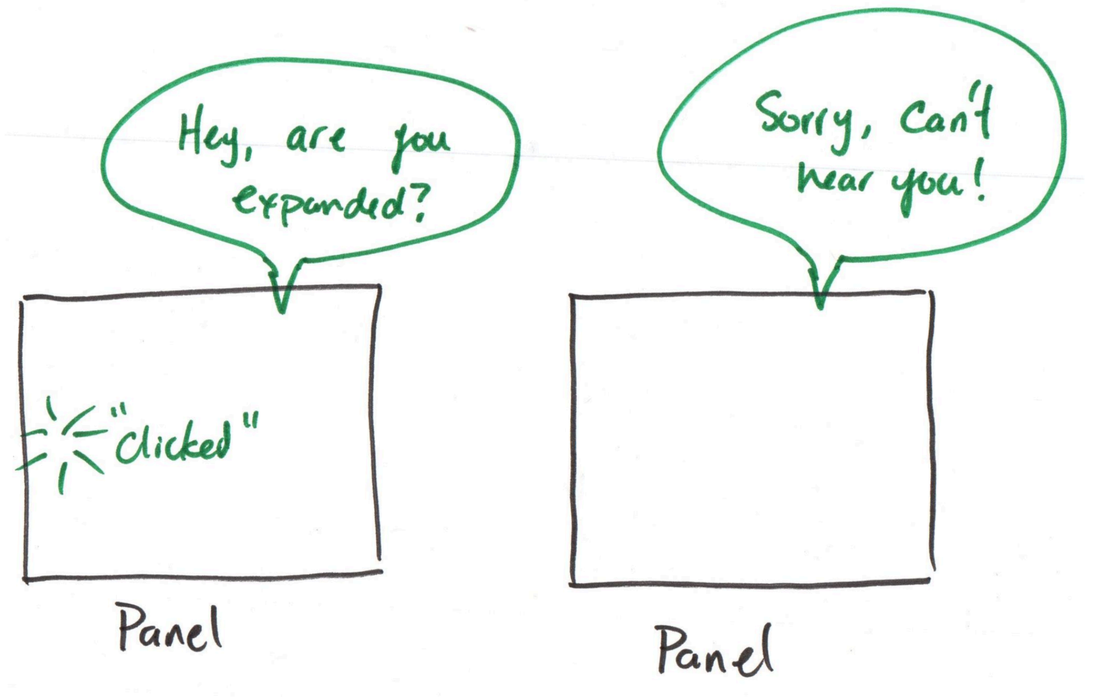
Review the component tree diagram on your handout.

How would you change the props and state to permit **only one** panel (item) to be expanded at a time?



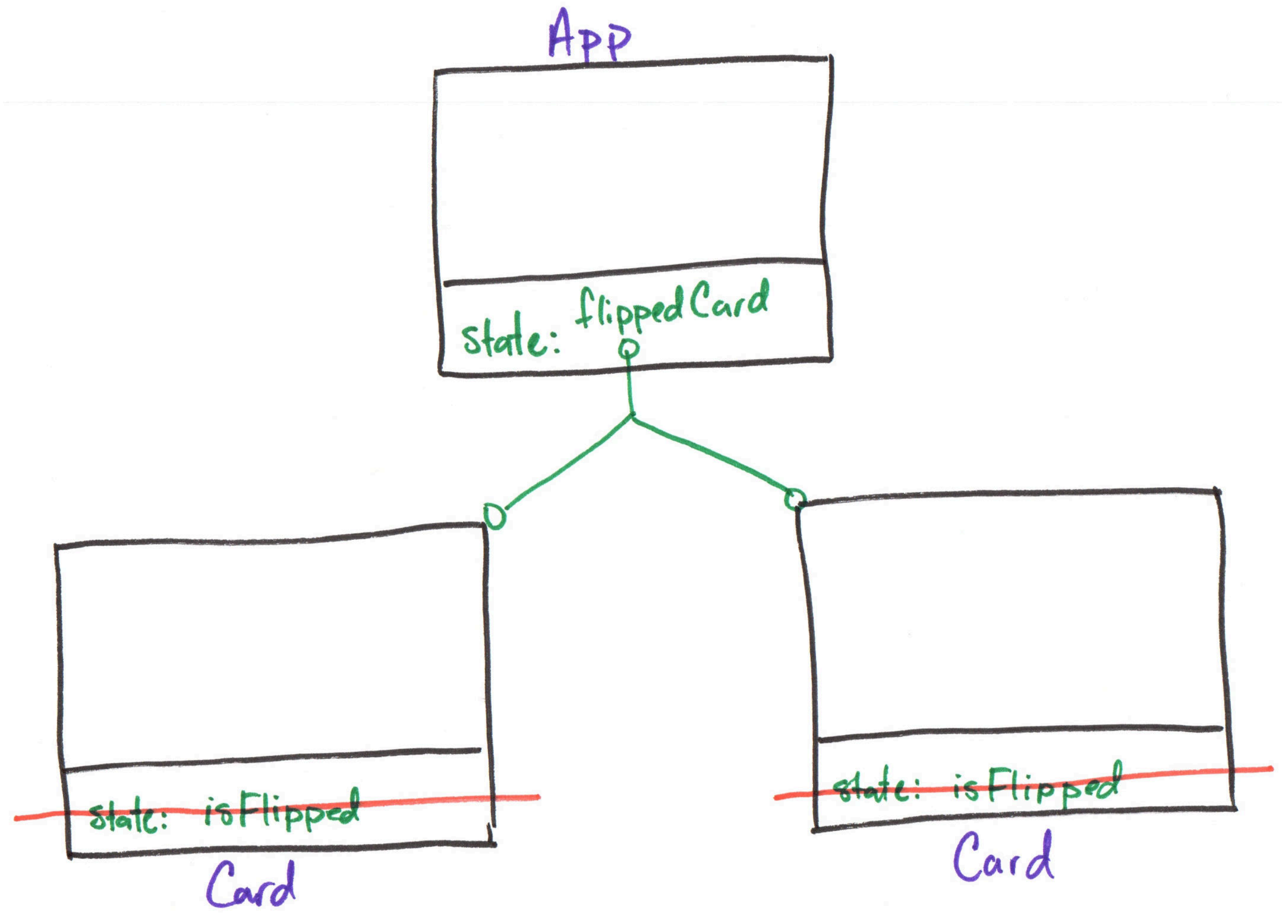
Lifting State Up

Gotcha: Children Do Not Know Each Other's State

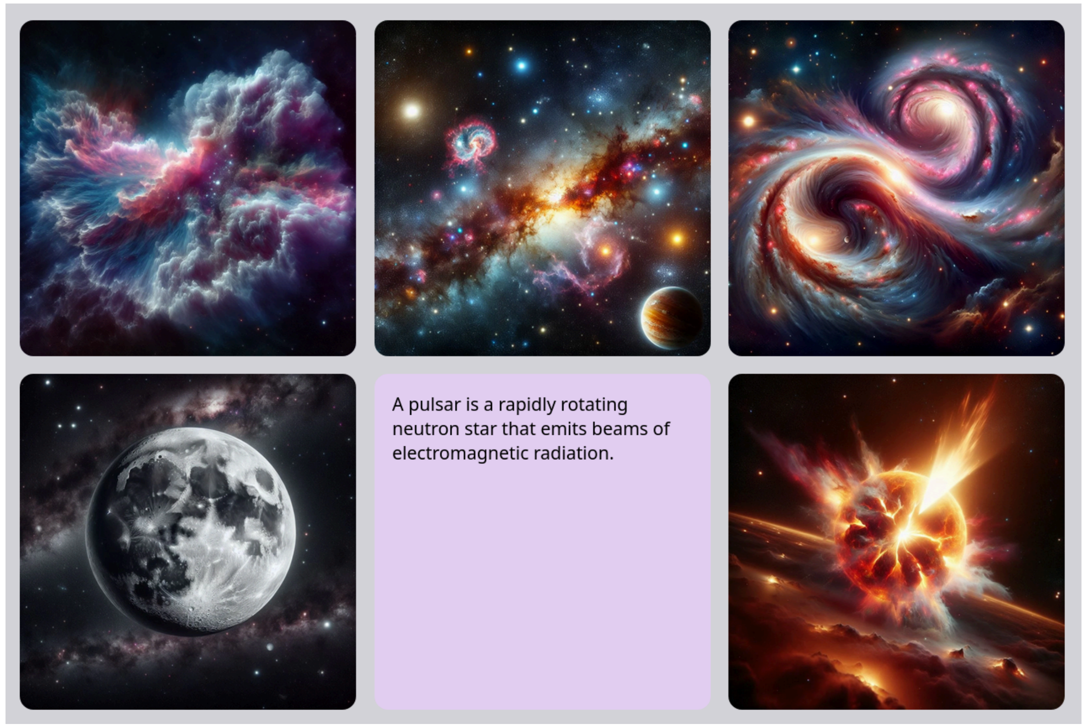


Solution: Lift the state up to the parent component, and pass the state down as props to the children.

Example: Lift State to a Common Parent

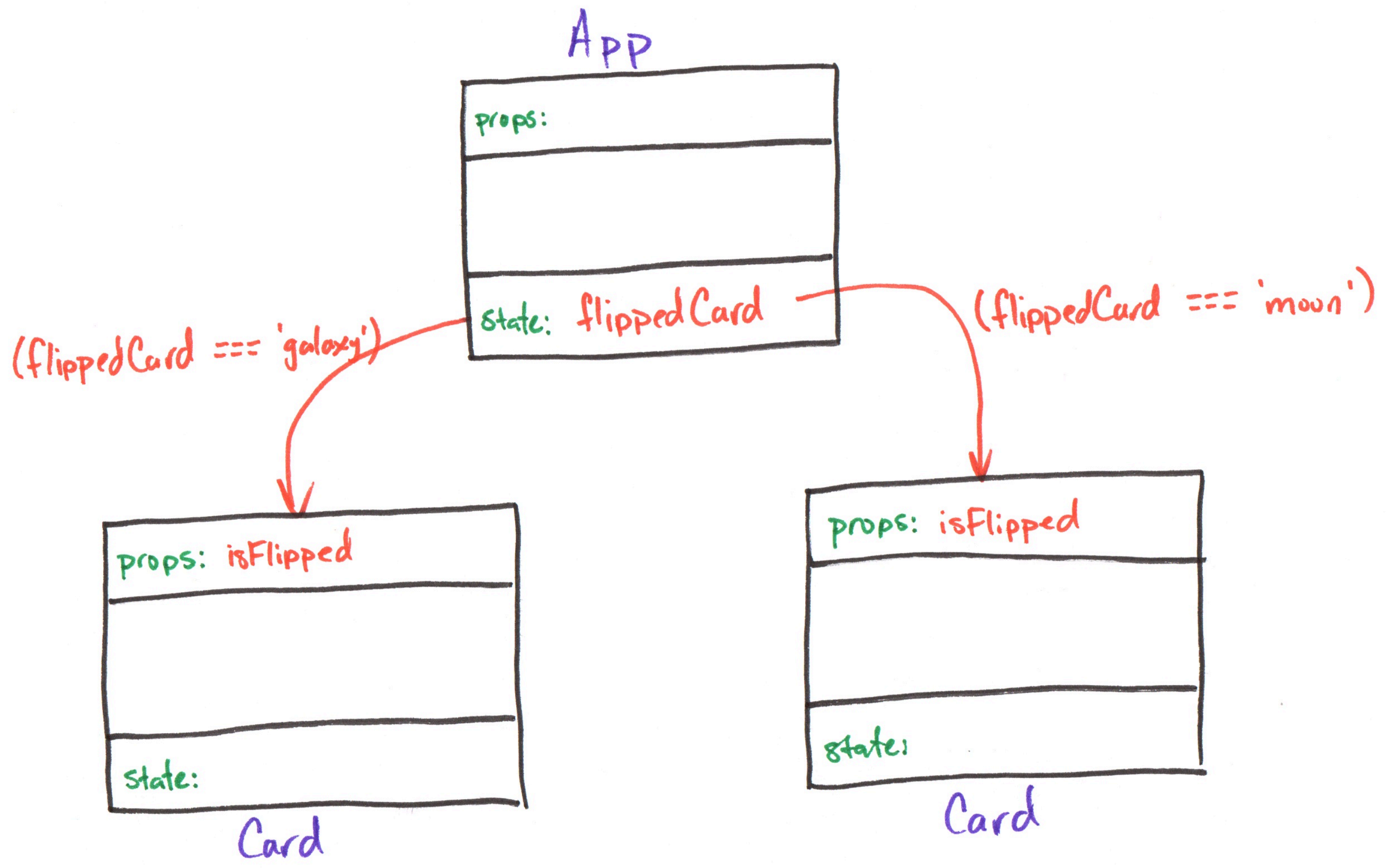


Demo: Only One Card – Lifted State


A pulsar is a rapidly rotating neutron star that emits beams of electromagnetic radiation.

```
const [flippedCard, setFlippedCard] = useState(true)
```

Example: Lifted State Component Tree



Demo: Only One Panel – 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`

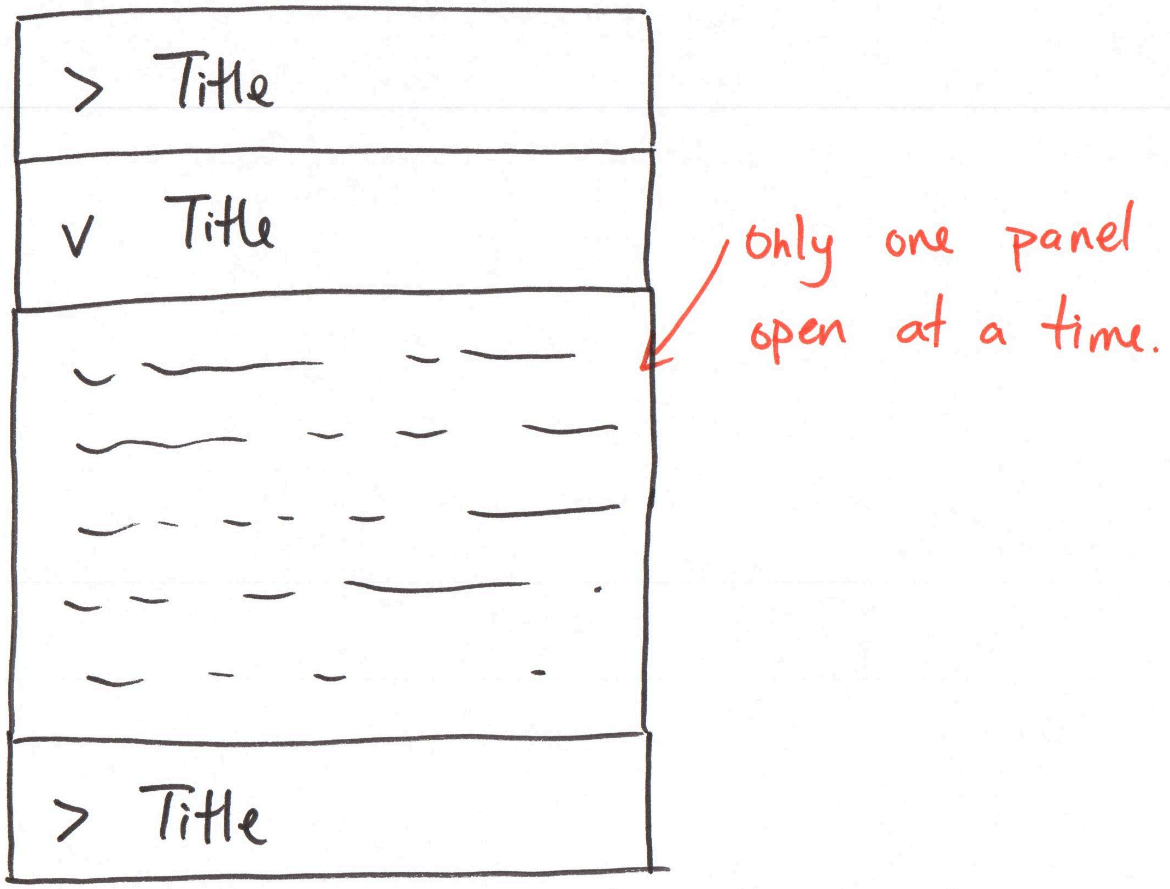
```
export default function Card({ imgUri, altText, isFlipped }) {
  return (
    <div className="card">
      <button aria-label="flip card">
        <img src="/icons/flip.svg" />
      </button>

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

Gotcha: Remove event handlers from the children *for now.*

Activity: Only One Panel State

Working with your peers (2-4), complete item **4** on the handout.

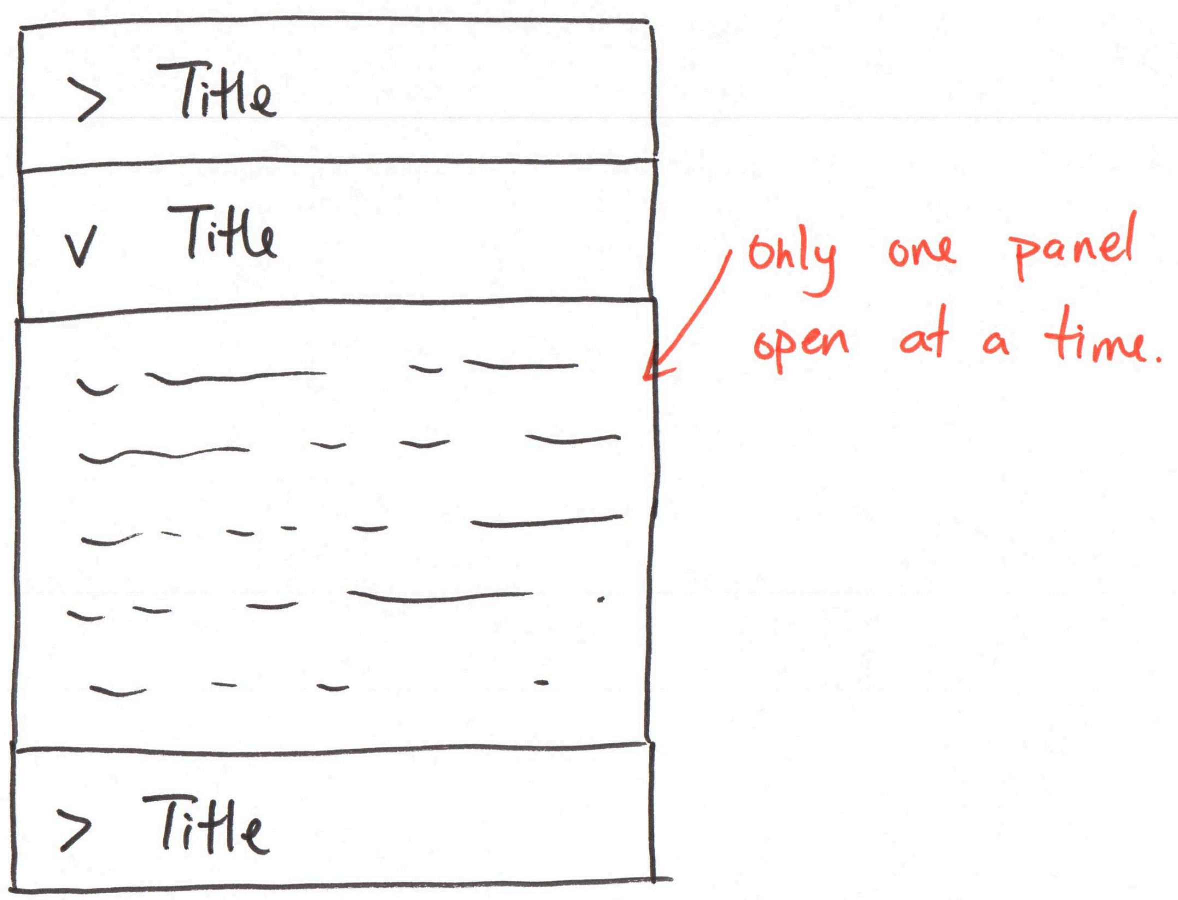


Activity: `expandedItem` State

Working with your peers (2-4):

1. Lift the expanded state up to the `Accordion` component.
2. Pass the expanded state down as props to the `AccordionItem` components.
3. Change the default expanded panel set to test that only one panel can be expanded at a time.

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



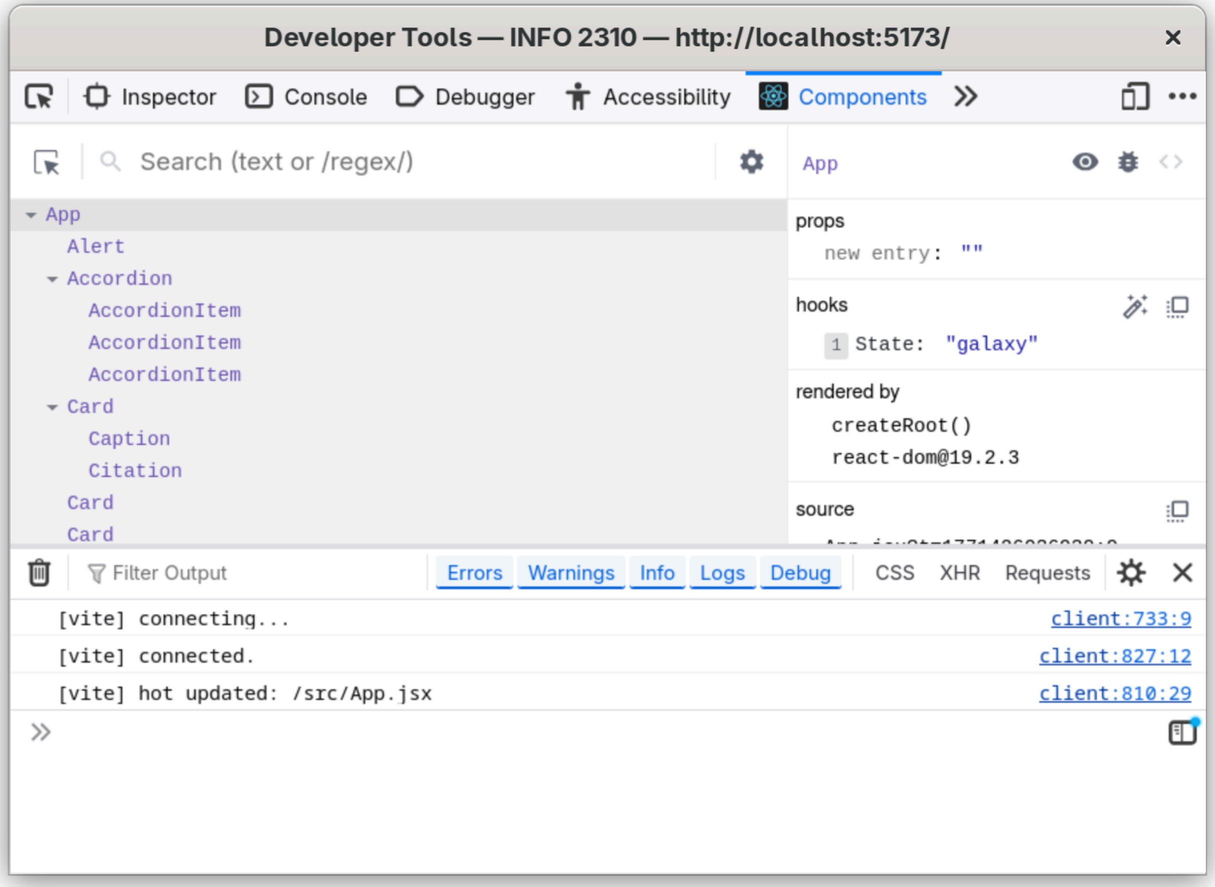
React Developer Tools

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

Activity: Check Your State



Developer Tools — INFO 2310 — http://localhost:5173/

```
▾ App
    Alert
  ▾ Accordion
      AccordionItem
      AccordionItem
      AccordionItem
  ▾ Card
      Caption
      Citation
    Card
    Card
```

App

props
`new entry: ""`

hooks
`1 State: "galaxy"`

rendered by
`createRoot()`
`react-dom@19.2.3`

source

```
[vite] connecting...                    client:733:9
[vite] connected.                       client:827:12
[vite] hot updated: /src/App.jsx        client:810:29
```

Summary

- Props are read-only data passed from parent to child.
- State is private data stored in a component that can be updated by that component.
- When multiple components need to share state, lift the state up to their closest common ancestor.
- Use a component tree diagram to visualize the component hierarchy and the flow of data (props) and state.
- Use React Developer Tools to inspect the component tree, view props and state, and debug your React applications.8- Props are read-only data passed from parent to child.

What’s Next

Due Thursday: Homework 2

Friday: Practice Problem Workshop: Exam I Practice & Study Session

Monday: Exam I