#### Codesandbox

- https://codesandbox.io/
- letcure 13: <a href="https://codesandbox.io/s/lecture-13-rmvgk6">https://codesandbox.io/s/lecture-13-rmvgk6</a>

# **Topics**

- List and Keys
- Multiple Components
- Props vs State
- Refs
- Lifecycle Methods

list.jsx

#### **Lists in React**

- Use map to create a list of elements
- Each element needs a unique key prop
  - " Warning: Each child in a list should have a unique "key" prop.
- key is used by React to identify which items have changed, added, or removed

multiple.jsx

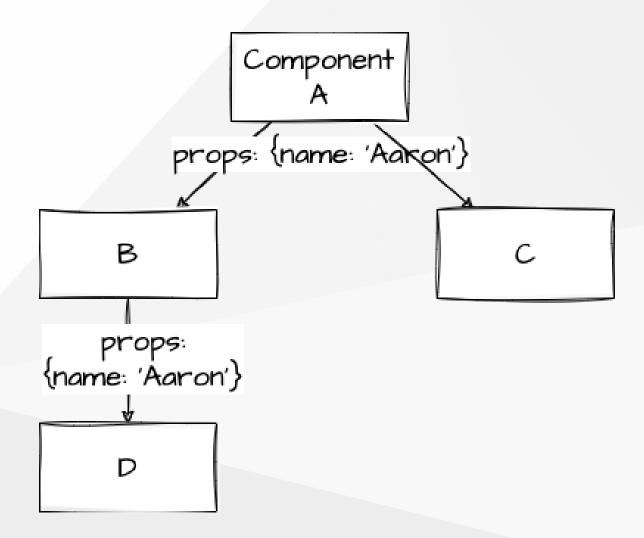
## Multiple components

- presentational components vs. container components
- presentational components: only render UI
- container components: manage state

props.jsx

#### **Props**

- props is immutable
- props is passed from parent to child, uni-directional
- props change would trigger re-render
- callback functions can be passed as props



# **Prop Types**

• prop-types <u>package</u>

#### **Props vs State**

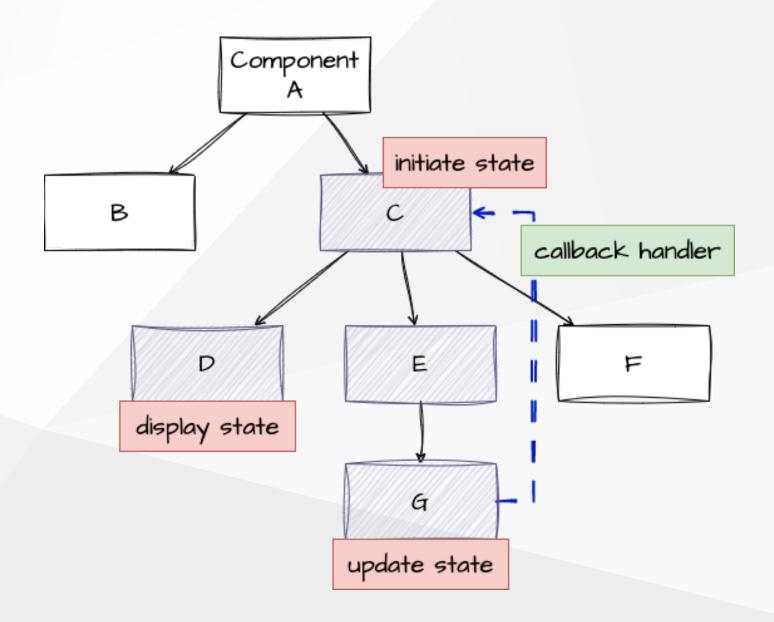
- props is immutable
- state is mutable with setState
- props is passed from parent to child, while state is local to the component
- props and state change would trigger re-render

# Callbacks in Props

 Callback functions can be passed as

#### props

 Callback functions can be used to pass data from child to parent



## **Controlled Components**

https://reactjs.org/docs/forms.html#controlled-components

refs.jsx

#### Refs

- ref is used to access DOM elements, or React components
- focus, text selection, media playback, triggering imperative animations, etc.
- how to use
  - React.createRef() create a ref
  - ref={this.myRef} assign the ref to a DOM element
  - this.myRef.current access the DOM element
- should not overuse ref, use state instead

#### forwardRef

https://reactjs.org/docs/forwarding-refs.html

#### **Component Lifecycle**

- What is the lifecycle of a React component?
- What are the lifecycle methods?
- What are the use cases of lifecycle methods?

## Lifecylce Methods

- Mounting: when a component is being inserted into the DOM
  - constructor()
  - componentWillMount()
  - c render()
  - componentDidMount()
  - o render()
- Updating: when a component is being re-rendered by changes in props or state, or forceUpdate()
  - componentDidUpdate() / shouldComponentUpdate()
- Unmounting: when a component is being removed from the DOM
  - componentWillUnmount()

## Lifecycle in Components Tree

- componentDidMount() is called after all children are mounted
- children's updating lifecycle methods are called before parent's
- execution is recursive in depth-first order

clock.jsx

# **Example: Clock**

#### How to start with React?

- 1. According to the design and requirements, write down the HTML structure
- 2. Break down the HTML structure into React components
- 3. Confirm the data flow (props and state) between components
- 4. Display state connect the components with data flow
- 5. Modify state add event handlers to specific components / lifecycle methods
- 6. Beautify the UI with CSS
- 7. Refactor the code from step 2 to 6