CS 5520
MOBILE APPLICATION DEVELOPMENT

Week 2

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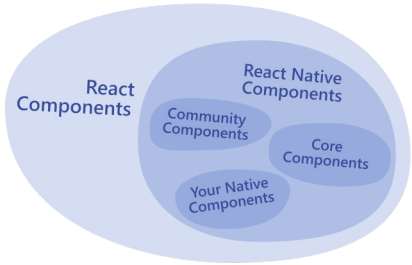
Today's Learning Outcomes

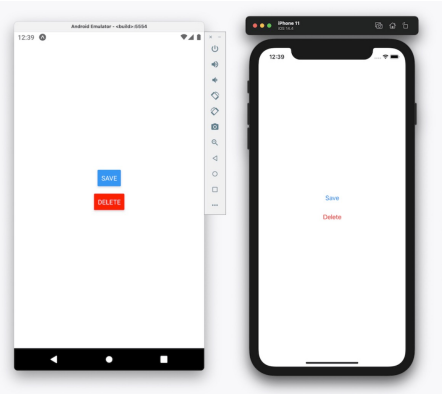
- To learn what are the properties (props) in React
- To explore the states available in React
- To become familiar with some React Native core components

React Native Components



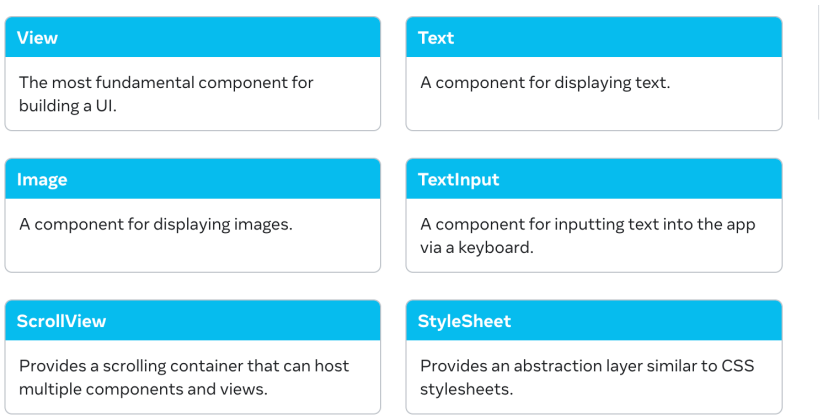
- All React Native apps are made of components
  - Small reusable pieces of your app, all working together
- React Native components are rendered into a counterpart native components.

- Do all core components look the same on all platforms?
  - Apple Design Guidelines
  - Android Design Guidelines



Core Components

- Essential, ready-to-use Native Components. Most apps will end up using one of these basic components:



- Which React Native core components are being used in App.js?
  - Note the import statement from 'react-native' at the top
- React Native uses the same API structure as React components. Let's do a quick intro on React.

Componentizing!

Whatever a function component returns is rendered as a React element

```
const Cat = () => {
  return (
    <Text>Hello, I am your cat!</Text>
  );
}

export default Cat;
```

Function component

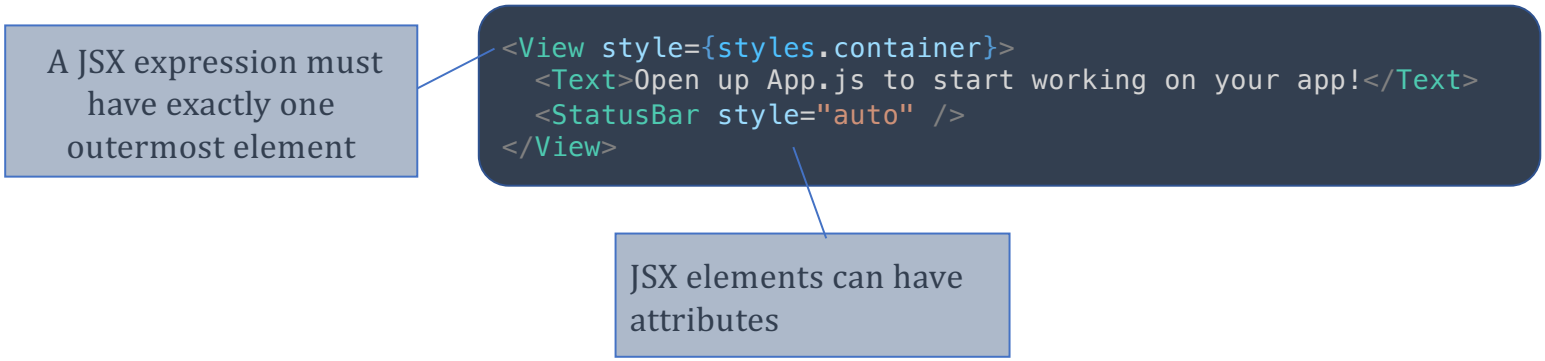
```
class Cat extends Component {
  render() {
    return (
      <Text>Hello, I am your cat!</Text>
    );
  }
}

export default Cat;
```

Class component

- Export and import cheatsheet

What is JSX?

- React and React Native use JSX (JavaScript as XML)
  - Saved in a .js file
  - JSX elements can go anywhere JavaScript expressions can go



Activity – JSX

- In App.js, inside the App() function, before the return statement, add a const variable `name` with the value being the name of your app. Update the <Text> component to use the `name` variable.
  - Hint: curly braces create a portal into JS functionality in your JSX!
    - You can do JS function calls inside {} in JSX

Props

- Props (short for properties): arbitrary input to React components.
  - Can be used to customize a component, pass data to components, etc.
  - A mix of the two mental models above: HTML attributes and function parameters.

```
const Cafe = () => {
  return (
    <View>
      <Cat name="Maru" />
    </View>
  );
}
```

```
const Cat = (props) => {
  return (
    <View>
      <Text>Hello, I am {props.name}!</Text>
    </View>
  );
}
```

- What props can you identify in App.js?

Activity – Props

- Create a new folder called "components" and make a new file called Header.js in that folder.
  - Add a <View> component with a <Text> component inside it.
    - What happens if you write some text without wrapping it in <Text>?
  - Import the new <Header> component in App.js and replace <Text> in App.js with <Header />
    - The <App> component is a parent component and the <Header> component is a child component

- Pass the application name to Header component as a variable using props.
  - Hint: props: All JSX attributes and children of a user-defined component are passed to it as a single object.
  - React Props Cheatsheet: 10 Patterns You Should Know
  - Object destructuring
  - Typechecking With PropTypes

State hook

- State is like a component's personal data storage; it gives your component memory!
- `useState` hook takes the initial value for a state variable and return an array with the current state value and a function that lets you update it.

```
[<getter>, <setter>] = useState(<initialValue>)
```

- The initial state argument is only used during the first render.
- During the next renders, useState gives us the current state.

array destructuring

```
const [age, setAge] = useState(42);
const [fruit, setFruit] = useState('banana');
const [todos, setTodos] = useState([{ text: 'Learn Hooks' }]);
```

- Setting a state variable causes the component to re-render!

<TextInput> Component

- TextInput's props:
  - Provide configurations such as auto-correction, placeholder, keyboard types, etc.
  - Event handlers such as onChangeText, OnKeyPress, OnFocus, etc.
    - The value to this kind of props should be a function

```
<TextInput
  style={styles.input}
  onChangeText={onChangeNumber}
  value={number}
  placeholder="useless placeholder"
  keyboardType="numeric"
/>
```

- Controlled component: An input form element whose value is controlled by React's state variable
  - Keep input's value in sync with a state variable

Activity - TextInput

- Add a <TextInput> in App.js.
- Create a state variables to keep track of the value of <TextInput> element:
  - Set `value` attributes of the <TextInput> equal to the state variable.
    - This prop can be used to set an initial value for TextInput. By linking it to the state variable, the value passed to useState will be used as the initial value of the TextInput.
  - Set `onChangeText` attribute of the <TextInput> to a function that receives the new text as a parameter and call the set state function with the received value

- Add a <Text> component in App.js. Update this component with the text that user enters in the TextInput.

<Button>

- Button has 2 required props. What are they?
- Move the <TextInput> to a new component called Input.js.
- We need to be able to pass the text the user has entered back to App.js.
  - Child component can receive and call a **callback function** from the parent
- Define a function in App.js and pass it as a prop to Input.js
  - NOTE: Don't pass the setState function directly as a prop. This is not recommended and it's an anti-pattern.
- Add a Button called Confirm in Input.js. In its onPress prop call the callback function that is passed to the component and pass the entered text in it.
- Clear the state variable that's tracking the text when the button is pressed

<Modal>

- Let's wrap the code in Input.js in a <Modal> component.
  - You need to add a container styling to the View in Input.js
- By default, the Modal is always visible.
- Define a state variable in App.js to keep track of modal's visibility.
- Pass the state variable to Input.js and use it as Modal's visible prop
- Add a Button in App.js that would make the Modal visible when it's pressed.
- Update thecallback function passed to Input component to also make the modal invisible when user has added a goal.
- Add a Cancel button to the component to dismiss the modal.

<Image> Component

- Add an <Image> component in the Input component. Practice setting the Source prop with two different methods:
  - From a URL: https://cdn-icons-png.flaticon.com/512/2617/2617812.png
  - A local resource: save the above image in your codebase
- Set the style prop to width:100 and height:100

Debugging

- Different kinds of errors that might happen in your app:
  - Syntax error
  - Logical errors
  - Styling, layout, UX errors
- How to Debug?
  - Read the error messages!
  - console.log()
  - Chrome Debugger + Breakpoints
    - Bring up the developer menu on the simulator/device and select "Debug Remote JS"
    - On the browser page that opens navigate to Source tab in developer tools and set breakpoints
  - https://www.npmjs.com/package/react-devtools