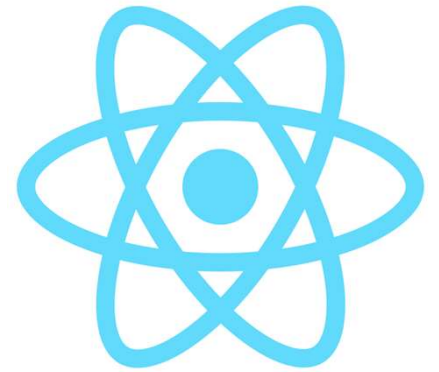# An Introduction to ReactJS and AWS Amplify

Luke Smyth

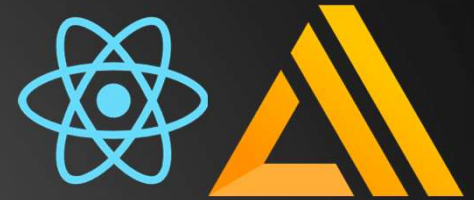# Prerequisites
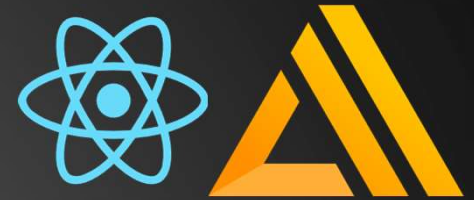
- A development environment - https://code.visualstudio.com/

- AWS account with some permissions - http://console.aws.amazon.com/

- NodeJS - https://nodejs.org/en/download/

- Git - https://git-scm.com/downloads

- `git clone https://github.com/smythluke/recipe-book.git`

Contents

- What is React JS?
- Create React App
- JSX & Elements
- React Components
- Handling State
- Handling Events
- Controlled Forms
- React Router

- What is AWS Amplify?
- Amplify Console
- Amplify CLI
- Amplify Libraries
  - Auth
  - API
  - Hosting

What is React JS?
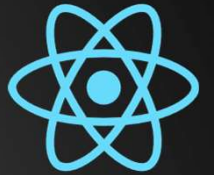
- A JavaScript library for building user interfaces

- It doesn't do anything back end

- Makes it easy to create interactive UIs

- Manages changes to the UI efficiently

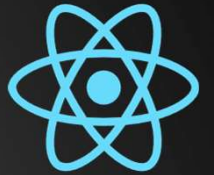- Lets you abstract detail so your code makes sense and can be reused
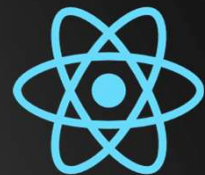
Create React App

- `npx create-react-app recipe-book`
- `cd recipe-book`
- `npm start`

- Open a browser and go to http://localhost:3000
- Sets up babel and webpack
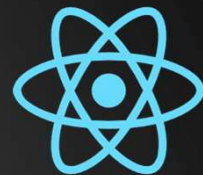
Create React App

- ./package.json

- ./public/index.html

- ./public/manifest.json

- ./src/App.js

- ./src/App.css

- ./src/index.js
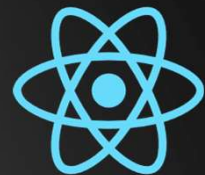
- ./src/index.css

Bootstrap & scss

- Optional, it just makes it easier and quicker to get something looking remotely nice

- I'll try not to use it too much

- `npm install bootstrap`

- `npm install node-sass`

- Within ./src/App.scss

  ```
  @import "../node_modules/boostrap/scss/bootstrap";
  ```

JSX & Elements

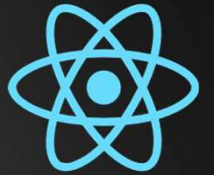- JavaScript XML (JSX) is an extension of JavaScript written for React

- Optional but recommended

- Lets you render components in a familiar way

- You can put JS expressions within JSX using { } (but not statements)

- React elements are immutable objects and take less resources that DOM elements

- React DOM updates the DOM to match the React elements

`git checkout 098d68d99571499943c7de70c0fb3fe815ec68d7`

React Components

- Let you split the UI in to independent, reusable pieces

- Written as functions or classes

- Accept inputs and return React elements to display

- App is a component

git checkout e3ef107b688be5b30bb93b4d914893606084a729
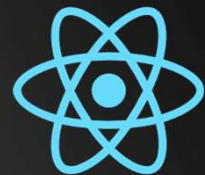
Handling State

- "The particular condition that something is in at a specific time"
- A component must be defined as a `class` if it is to have state
- Use a `constructor` to assign the initial `this.state` value
- `componentDidMount()` and `componentWillUnmount()`
- `this.setState({})` and `this.setState(function)`
- State updates are merged in a shallow way

git checkout e60d34a350415fe0359a8cace46d348fd63710bc
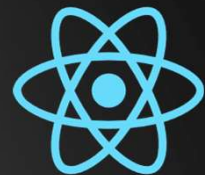
Handling Events

- Very similar to handling events on DOM elements

- Pass the event handler a function rather than a string

- Can't `return false` to prevent the default action

- You'll probably need `Function.prototype.bind()`
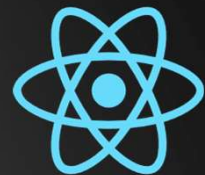
Controlled Forms

- Single source of truth in the components state
- `value={this.state.example}`
- `onChange={this.handleChange}`
- `select` elements don't use the `selected` attribute, this is stored in the elements `value`
- `textarea` elements have a `value` instead of children

React Router
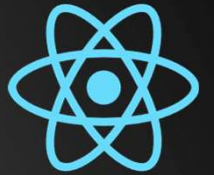
- Allows your single page web app to act more like a traditional site
- `npm install react-router-dom`
- `BrowserRouter, Switch, Route, NavLink`

What is AWS Amplify?

- Platform for building secure, scalable applications

- Version control, testing and deployment are all included

- Easily leverage other AWS services for authentication, data storage, analytics, machine learning + more

- Amplify Console

- Amplify CLI

- Amplify Libraries

https://docs.amplify.aws/

Amplify Console

- A place to view the services that you have configured as part of your project

- You can configure hosting options here too like custom domains and continuous deployment

Amplify CLI - Global

- `npm install -g @aws-amplify/cli`
- `amplify configure`
- Sign in to the AWS console
- Create a new user or type the name of an existing one
- Ensure the user has Admin privileges
- Provide accessKeyID and secretAccessKey to the cli

Amplify CLI- Per Project

- `amplify init`

- Enter a unique name – `recipe-book`

- Enter an environment name `- prod`

- Choose your code editor

- Select a javascript project with the react framework

- src, build, npm build, npm start

- default AWS profile

Amplify CLI- Per Project

- ./src/aws-exports.js
- ./amplify/.config/project-config.json
- ./amplify/backend/backend-config.json
- ./amplify/team-provider-info.json

Amplify Libraries

- Analytics
- **API**
- **Auth**
- Datastore
- Interactions

- Predictions
- PubSub
- PushNotification
- Storage
- XR

https://docs.amplify.aws/lib/q/platform/js

Amplify Libraries

- `npm install aws-amplify @aws-amplify/ui-react`
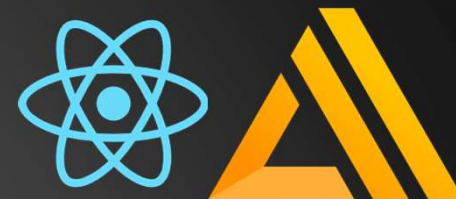
- Within ./src/index.js

```
import Amplify from 'aws-amplify';
import awsConfig from './aws-exports';
Amplify.configure(awsConfig);
```

Amplify Libraries - Auth

- `amplify add auth`
- Select Default configuration
- Select Email
- `amplify push`

Amplify Libraries - Auth

- Within ./src/AppWithAuth.js

```
import {AmplifyAuthenticator} from '@aws-amplify/ui-react';
<AmplifyAuthenticator usernameAlias="email">
  <slots></slots>
  <App />
</AmplifyAuthenticator>
```

- Within ./src/Navigation.js

```
Auth.signOut();
```

Amplify Libraries - API

- `amplify add api`
- `GraphQL`
- **Enter a name** `recipebook`
- `Amazon Cognito User Pool`
- `No, I am done.`
- `Single object with fields`
- **Edit the schema**
- `amplify push`

Amplify Libraries - API

- Within ./amplify/backend/api/<>/schema.graphql

```
type Recipe
  @model
  @auth(rules: [{allow:owner}]) {
    id: ID!
    title: String
    description: String
    rating: Int
    link: String
    owner: String
  }
```

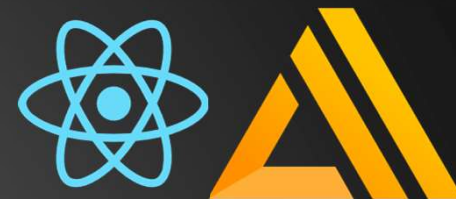https://graphql.org/learn/schema/   git checkout 2f9314c7abc9376d445490e1f5fa9f1f5938d403

Amplify Libraries - API
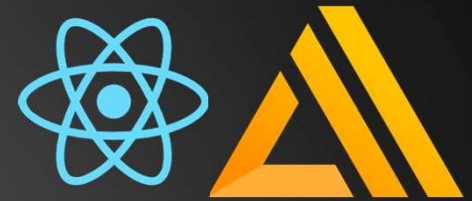
- Within ./src/AddRecipe.js

```
import { API, graphqlOperation } from 'aws-amplify'
import { createRecipe } from './graphql/mutations'
API.graphql(graphqlOperation(createRecipe, {}))
```
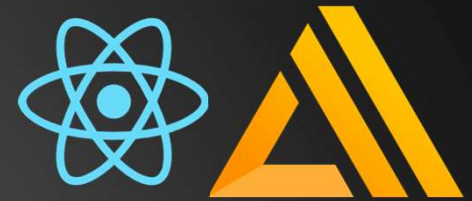
Amplify Libraries - API

- Within ./src/RecipeBook.js

```
import { API, graphqlOperation } from 'aws-amplify'
import { listRecipes } from './graphql/queries'
API.graphql(graphqlOperation(listRecipes))
```

Amplify Libraries - API

- Within ./src/RecipeBook.js

```
import { API, graphqlOperation } from 'aws-amplify'
import { onCreateRecipe } from './graphql/subscriptions'
API.graphql(graphqlOperation(onCreateRecipe)).subscribe()
```

Amplify CLI / Console - Hosting

- `amplify add hosting`

- **Choose Amplify Console**

- **Choose manual deployment**

- `amplify publish`

- **Rewrites and redirects**

- `</^[^.]+$|\.(?!(css|gif|ico|jpg|js|png|txt|svg|woff|ttf|json)$)([^.]+$)/>`

Questions?