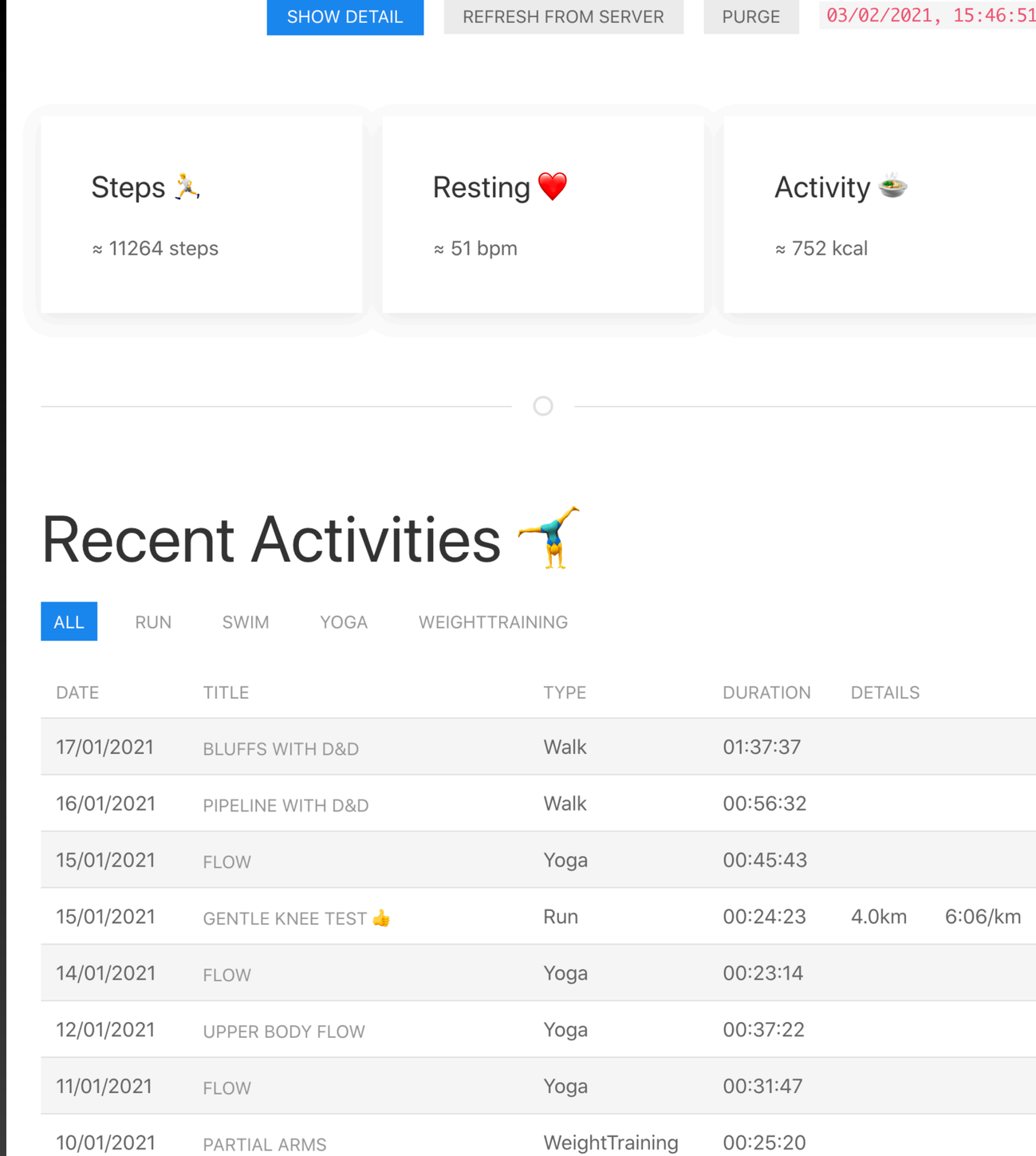
Modern Web App Development

React + TypeScript + ❤️

North Island College, February, 2021

The Plan

- What is React?
- Learn to “think in React”
- Incrementally build up an application as we go along
- Add TypeScript at the end



What is React?

What is React?

- JavaScript interface library
- Web and beyond
- Written in an idiom of JavaScript called JSX
- Try it at codesandbox.io

```
function Header() {
  return <p>Hello</p>;
}
```

React is Just UI

- No persistence
- No networking
- No data modelling
- No routing
- No styling
- No architecture

What is React?

- Simple views for each state of your application
- React uses props and state to change just the right components when your data changes
- Declarative views make your code more predictable and easier to debug

```
function Header(props) {
  if (props.loggedIn) {
    return <p>Welcome back</p>;
  } else {
    return <p>Who are you?</p>;
  }
}
```

What's a Component?

- Components are the core unit of React
- Components are re-usable and composable
- Components are functions
- Components are meant to be "pure" (same output from same inputs)

```
// use your own components
import Header from './Header';
import Page from './Page';

// or third-party components
import Sparklines from 'sparklines';

// this makes an <App /> component
function App(props) {
  // do our regular JS stuff
  const pageTitle = props.title || "React 2021 + ❤️";

  // components return JSX
  return (
    <Page title={pageTitle}>
      <Header loggedIn={true} user="Myfanwy" />
      <Sparklines data={[1,2,5,7,2]} />
    </Page>
  );
}
```

React uses JSX

- JSX is a strange mix of JavaScript and HTML markup
- JSX attributes can be literals
- Or if you use {...} curly braces then attributes can be JavaScript

```
// this import used to be required to trigger JSX but no longer
import React from 'react';

function App(props) {
  const title = props.title || "React + ❤️";

  // angle brackets show that we're using JSX
  const header = <Header loggedIn={true} user='Myfanwy' />;
  const footer = <Footer copyright={new Date().getFullYear()} />;

  // regular JS
  const navLabels = ['Snacks', Daydreams'];

  // JSX can even be an array as long as each element has a `key`
  const navItems = navLabels.map(function (navLabel) {
    // JSX can be React components or regular DOM elements
    return <li key={navLabel}>{navLabel}</li>
  })

  return (
    <Page title={title}>
      {header}
      <NavBar currentContext='billing'>
        {navItems}
      </NavBar>
      {footer}
    </Page>
  );
}
```

Props Versus State

- Both ways to give data to component
- Can be strings, numbers, objects... almost anything
- Props come from outside and are readonly to the component
- State is managed inside the component and is meant to change

```jsx
import { useState } from 'react';

// this component receives props
function Header(props) {
  if (props.loggedIn) {
    return <p>Hi buddy!</p>;
  } else {
    return <p>Who are you?</p>;
  }
}

// no props, just state in this component
function App() {
  // here is how we define a bit of state we want to track
  // it gives us a `count` variable and a `setCount` function
  // to change the state
  const [count, setCount] = useState(0);

  return (
    <div>
      <p>Count is {count}</p>
      <button onClick={() => setCount(count + 1)}>Up!</button>
    </div>
  );
}
```

Let’s Try A Bit

https://codesandbox.io/

Let's Build This App

github.com/alexdunae/nic-react-base

nic-react.netlify.app

SHOW DETAIL | REFRESH FROM SERVER | PURGE | 03/02/2021, 15:46:51

Steps 🏃

≈ 11264 steps

Resting ❤️

≈ 51 bpm

Activity 🥗

≈ 752 kcal

Recent Activities 🤸

ALL | RUN | SWIM | YOGA | WEIGHTTRAINING

DATE	TITLE	TYPE	DURATION	DETAILS	
17/01/2021	BLUFFS WITH D&D	Walk	01:37:37		
16/01/2021	PIPELINE WITH D&D	Walk	00:56:32		
15/01/2021	FLOW	Yoga	00:45:43		
15/01/2021	GENTLE KNEE TEST 👍	Run	00:24:23	4.0km	6:06/km
14/01/2021	FLOW	Yoga	00:23:14		
12/01/2021	UPPER BODY FLOW	Yoga	00:37:22		
11/01/2021	FLOW	Yoga	00:31:47		
10/01/2021	PARTIAL ARMS	WeightTraining	00:25:20		