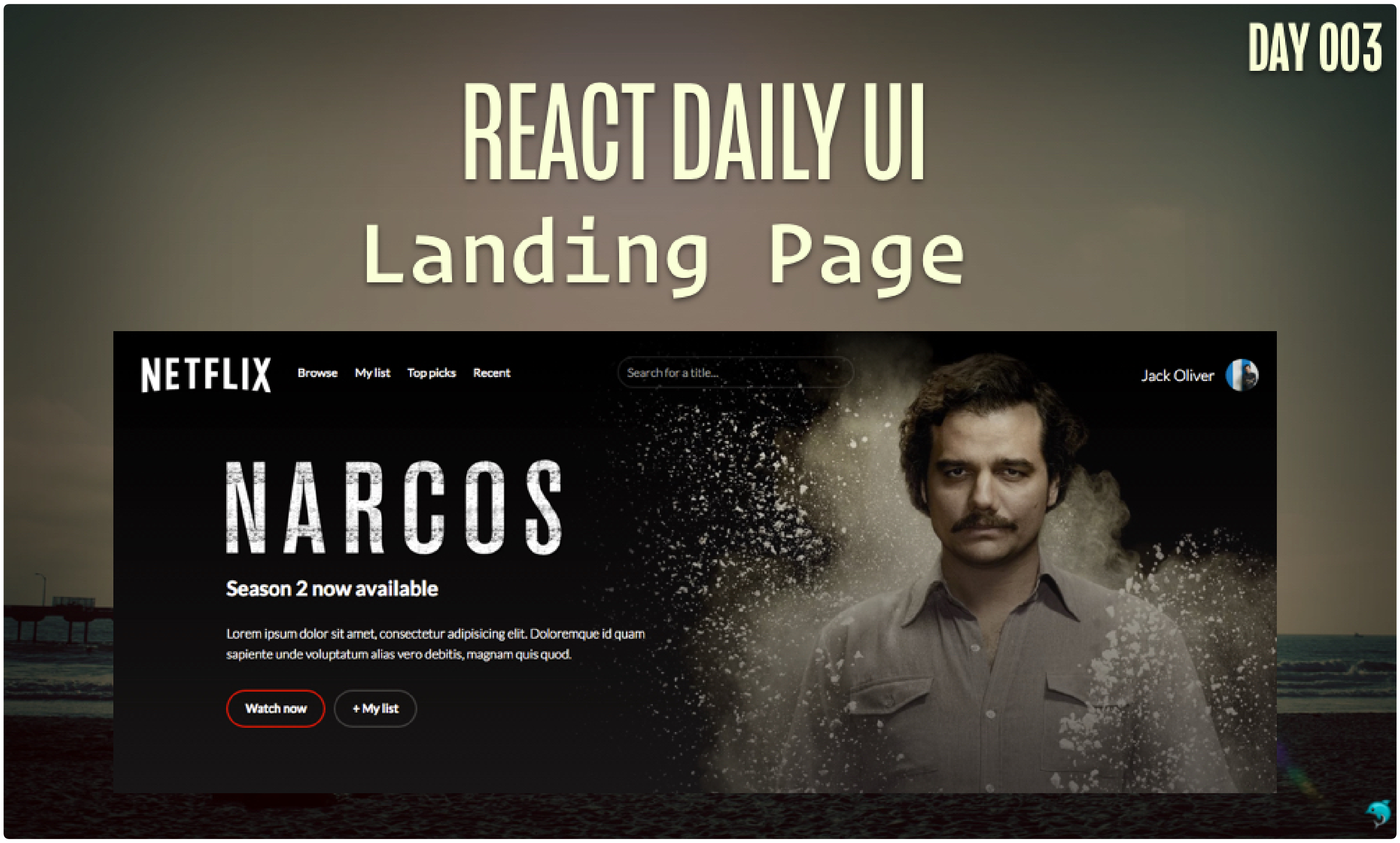


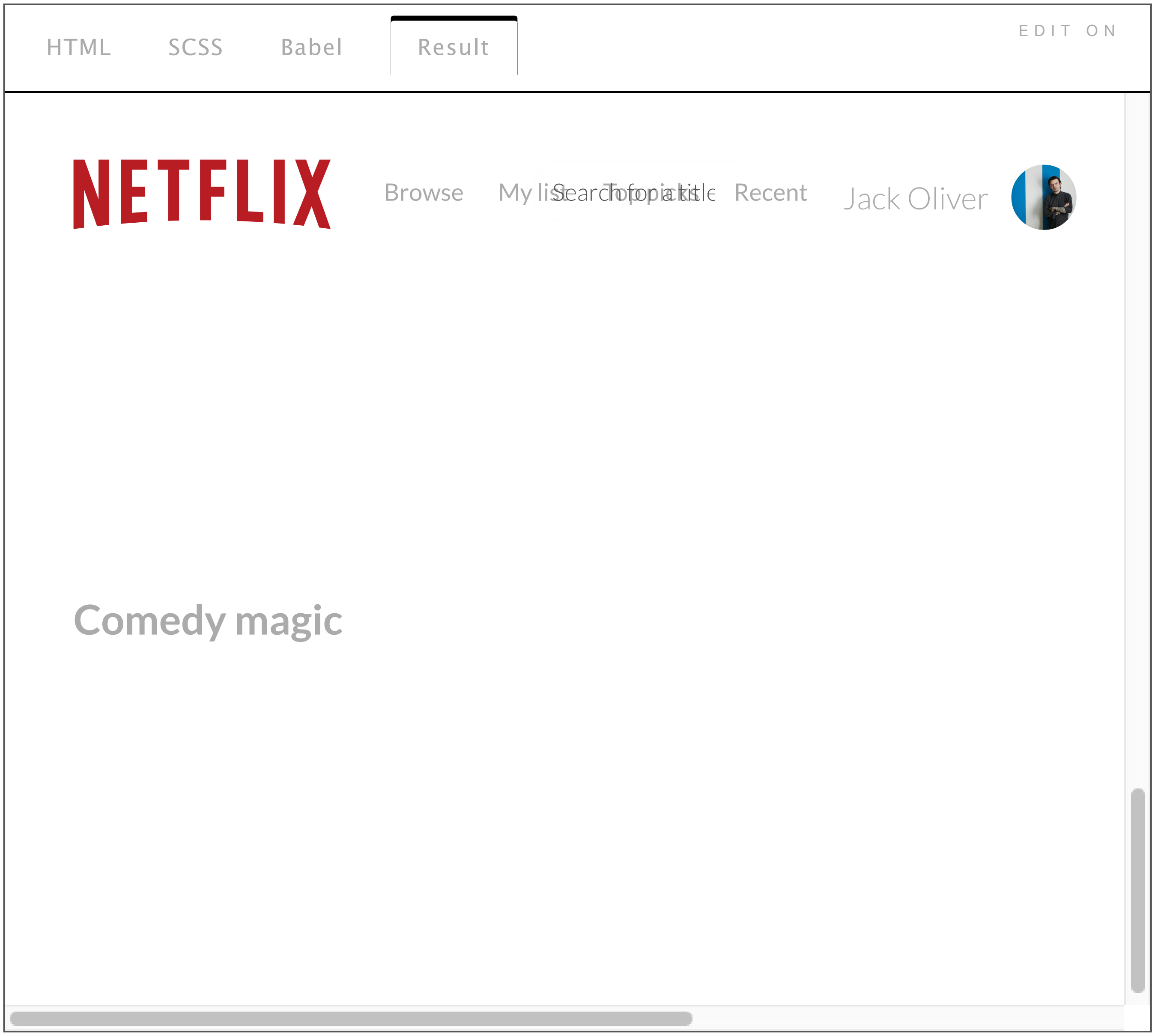
React Daily UI - 003 Landing Page

> This post is a part of the React Daily UI post series, a joint effort between Jack Oliver (http://www.jackoliver.info/), Sophia Shoemaker (https://twitter.com/wisecobbler), and the rest of the team at Fullstack React (https://www.fullstackreact.com/). Each day we're explaining in detail how to create a UI component with React.
>
> You can view the Codepen implementation here (http://codepen.io/jackoliver/pen/zBQAWo)
>
> Or you view the code on Github here (https://github.com/fullstackreact/react-daily-ui)

Welcome to React Daily UI, where we go 100 days building 100 beautiful React applications. We're really excited to be partnering with Jack Oliver (http://www.jackoliver.info/) who is embarking on this ambitious project with us.

Jack is designing and writing the code for these applications and we're going to deconstruct each one to highlight the features that are unique to React.

Today we're going to create a landing page similar to Netflix to browse movies:



Overview

This landing page has a couple of interesting components that we are going to explore today. There is a search box at the top that allows us to search for movies and get information about them. The API we'll be using is not actually the Netflix API, rather we're using an API from The Movie DB (https://www.themoviedb.org/documentation/api). They have an extensive database of movies and TV shows from all different genres and time periods. When we hover over the image of a particular show or movie, we get some more information about it. We also have the ability to select and deselect shows or movies we are interested in.

While our application appears to have many components, there are only 3 components that have logic modifying the state of our application. The three key components we'll look at are:

- Our main `App` component, which contains the logic for our search box. We'll use a controlled input for our search box and explain the difference between controlled and uncontrolled inputs in React.
- The `TitleList` component which contains the logic needed to retrieve results from The Movie DB API. This is where we'll use the JavaScript `fetch` API and explain how Promises work with the `fetch` API.
- The `ListToggle` component which has the logic for selecting and deselecting our favorite movies and TV shows. We'll learn how to use the `data` attribue combined with a component's `state` to toggle a view.

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The `App` component

Our `App` component is our main component. The `App` component contains a search box that displays search results when the user enters a search term and submits the form. The simplest way to implement this functionality is by using "controlled inputs", which we'll explain how to use in this section. React also has something called "uncontrolled inputs" which we won't use in our application, but it's important to know the difference between the two types.

Controlled vs Uncontrolled Inputs

React has two different approaches to dealing with form inputs. While the syntax is similar, there are some differences you need to be aware of when dealing with forms in React.

Uncontrolled Inputs

An uncontrolled input is an input that is just like any normal input we would use outside of React. When a user inputs data into a form field (an input box, dropdown, etc) the updated information is reflected. To access the form data we need to access the underlying DOM representation of the form itself. The JSX sytnax for an uncontrolled input looks like this:

```
<input type="text" name="title"/>
```

Notice that there is no `value` attribute in the input -- adding the `value` attribute would make it a controlled input.

Controlled Inputs

The other variety of form inputs is called a "controlled input". React handles the value of the input, not the browser. The JSX syntax for a controlled input looks like this:

```
<input type="text" name="title" value="Hello World!"/>
```

When the user tries to type in the input box, nothing will change. In order for the user to see changes, we need to do two things:

1. Add an `onChange` handler to the input
2. Change the `value` attribute of the input from a hard coded string (or empty) to use a value contained in our component's `this.state` property.

From the example above, our input would now look like this:

```
<input type="text" value={this.state.value} onChange={this.handleChange}/>
```

So, how does this work in our application? For a simple search box, we use a controlled input. This allows us to easily update other parts of our application based on what the user inputs into the search box. We will store our input box's value in the `this.state.searchTerm` property of our component and pass the data to the child component that needs it to render the right information when the user hits enter or clicks the submit button.

What is `state`?

When we refer to a component's `state`, we mean a snapshot of the instance of the component on the page. React's components can define their own `state` which we'll use in today's post, and others in the future. Using the `state` property allows us to manipulate a React component's view and data associated with the view to keep track of the local state of the component.

We set the initial state of our input by defining a method called `getInitialState`. React expects us to return a JavaScript object from this method that stores any sort of data we want to manipulate or display in the component.

Let's tell React that the `App` component keeps a two items in it's local state, a string we will call `searchTerm` and a string we'll call `searchUrl`:

```
getInitialState: function() {
  return {searchTerm:"", searchUrl:""};
},
```

Similar to the example input we looked at above, our search box input has an `onChange` handler and the value of our input is `this.state.searchTerm`:

```
  <input onKeyUp={this.handleKeyUp} onChange={this.handleChange} type="searcl
```

`onChange` event handler

When the user types a search term in the input box, the `onChange` event is triggered and the `handleChange` function is called. In the `handleChange` function we modify the value of `this.state.searchTerm` by using the `this.setState()` function. Although a component's state is available via `this.state`, we should treat `this.state` as a readonly object and only ever change the state using the `setState` method available on a React component.

The `setState` method sends the state object into a queue to be batched for DOM updates, so modifying or changing any portion of a component's state should only happen via `setState`.

`onKeyUp` event handler

We have another event `prop` on our `input` box, `onKeyUp`. When the user pushes a key down and then releases a key in the `input` box, this event is triggered, similar to how the `onChange` event is triggered. We assign the `handleKeyUp` function to this `prop`. In this function we check if the user has pressed the `enter` key. If so, then we generate the search url and call `this.setState` to set the correct URL:

```
    if (e.key === 'Enter' && this.state.searchTerm !== '') {
      var searchUrl = "search/multi?query=" + this.state.searchTerm + "&api_l
      this.setState({searchUrl:searchUrl});
    }
  },
```

If `this.state.searchUrl` is blank, the `TitleList` component (which we'll explore in the next section) that contains the search results doesn't render any results. If `this.state.searchUrl` contains a string (or that string changes) the `TitleList` component containing the search results renders the data.

The `TitleList` component

In our application, we have a `TitleList` component that displays the various movies and TV shows for each section. To retrieve the information about the movies and TV shows, we will query The Movie DB API using the global `fetch` method in JavaScript. This new method replaces the XMLHttpRequest API and is a cleaner, simpler interface which makes use of Promises.

Promises in JavaScript

JavaScript is a single threaded environment. What does this mean? It means that when a piece of code is running, no other code can be running at the same time. Why does this matter? If we have code in an application that takes a long time (more than a few seconds), we don't want to stop our entire application from running in case the user decides to interact with it in some other way.

Promises allow us to write non-blocking code. For example, in our application we are making requests to The Movie DB API. When we request information about movies from this API, we don't want to block other parts of our application from running while we are waiting for a response back from the server.

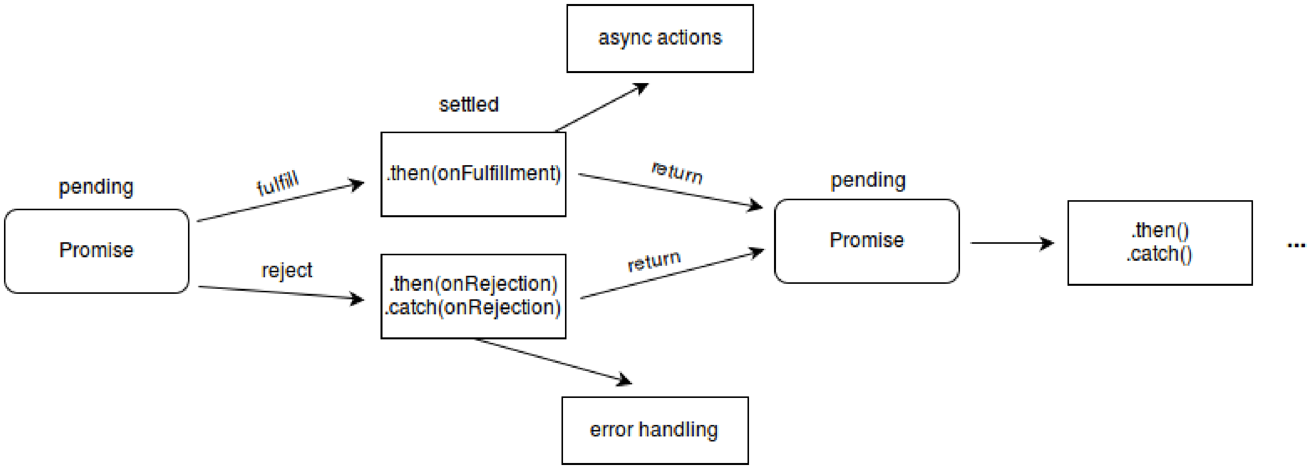
What is a Promise?

> A `Promise` in JavaScript is an object that represents a value that is either available now, in the future or possibly never. When a `Promise` is created, the actual value of the of the `Promise` is not necessarily known. A `Promise` allows for asynchronous actions such as AJAX requests.

The `fetch` API uses Promises so it's important to learn how Promises work so we can understand the `fetch` API better. A Promise object has three different states:

1. Pending -- the initial state
2. Fulfilled -- the operation completed successfully
3. Rejected -- the operation encountered a problem and did not complete

This graph from the Mozilla Developer's Network shows the flow of a Promise object as it handles operations:



Every `Promise` object has two important methods available: the `then` method and the `catch` method. The `then` method is what is called when the operation completed successfully. In the case of an AJAX request, this is where we handle the data that comes back from the request. The `catch` method is where we handle any errors.

Both of these methods return a `Promise`. Since these methods return a `Promise`, we can chain Promises together like so:

```
api().then(function(result){
    return api2();
}).then(function(result2){
    return api3();
}).then(function(result3){
     // do work
});
```

By chaining Promises together we can avoid what's commonly referred to as "callback hell" when we have multiple asynchronous actions we want to happen in a certain sequence.

Let's learn how to put Promises into practice by exploring the `fetch` JavaScript API.

The `fetch` API

The fetch API is the new EcmaScript6 (also known as ES6) standard for making requests. It is a better version of the XMLHttpRequest API, with a simpler, cleaner API and avoids "callback hell" by making use of Promises.

The `fetch` method takes two parameters—the URL that you are requesting (or a Request object) and an "options" object and it returns a `Promise` object. For our use case, we are just going to worry about the first parameter. If you're interested in learning how the options object is used, you can read more here (https://developer.mozilla.org/en-US/docs/Web/API/Fetch_API/Using_Fetch#Supplying_your_own_request_obje

In our component, we implement the `componentDidMount` method. This is the function where we want to make our AJAX requests to retreive data from The Movie DB API. This method is one of the many 'lifecycle hooks' that React components have. 'Lifecycle hooks' are methods that are executed at specific points in a component's lifecycle. We can define custom functionality in these methods during different phases of the component. The `componentDidMount` method is executed just after the component has been rendered to the page. Within our `componentDidMount` function we call a function: `this.loadContent`:

```
componentDidMount: function() {
  if(this.props.url !== ''){
    this.loadContent();
    this.setState({mounted:true});
  }

},
```

Our `this.loadContent` function is where all the action happens and we make a request for data. In the first line of this method we piece together the URL for our request:

```
var requestUrl = 'https://api.themoviedb.org/3/' + this.props.url + '&api_
```

Each `TitleList` component we use in our application retrieves different data from the API -- one `TitleList` component displays the most popular movies and TV shows right now, another `TitleList` component displays the best Sci-Fi movies and shows. In total, we use the `TitleList` component 6 different times to display a variety of movies and TV shows:

```
  <TitleList title="Search Results" url={this.state.searchUrl} />
  <TitleList title="Top TV picks for Jack" url='discover/tv?sort_by=popularit
  <TitleList title="Trending now" url='discover/movie?sort_by=popularity.des
  <TitleList title="Most watched in Horror" url='genre/27/movies?sort_by=popu
  <TitleList title="Sci-Fi greats" url='genre/878/movies?sort_by=popularity.
  <TitleList title="Comedy magic" url='genre/35/movies?sort_by=popularity.des
```

From our `App` component, we pass a `prop` to our component named `url` which is a string. This string is the portion of The Movie DB API that is different for each `TitleList` component.

Now, in our `this.loadContent` function, we refer to that string by using `this.props.url`. We concatenate the other pieces of the URL with `this.props.url` to create the full URL needed to make a request:

```
  var requestUrl = 'https://api.themoviedb.org/3/' + this.props.url + '&api_
```

Now that we've created the correct URL to retrieve the data we need, we can use the `fetch` method to actually get the data. The URL is the argument we pass to the `fetch` method, and the method returns a `Promise` object which we'll use to process the data received from the API request. As we mentioned previously, Promise objects have a `then` method which takes two callback functions as arguments. The first callback function is the one that gets called when the Promise successfully resolves (or in our particular scenario, we've received a response back from the server). The success callback function has a Response object as it's parameter. The Response object also has several methods available to it, one of which is a .json() method which also returns Promise. So, if you want to do anything with a response from an API request and that response is in a JSON format, you'll need to chain multiple Promises together like this:

```
fetch(requestUrl).then((response)=>{
    return response.json();
}).then((data)=>{
    this.setState({data : data});
}).catch((err)=>{
```

The response.json() returns a Promise that resolves to an object literal containing the data from our request.

After retrieving the data, we call `this.setState` to re-render our `TitleList` component and display the newly requested content:

```
}).then((data)=>{
    this.setState({data : data});
}).catch((err)=>{
```

`componentWillReceiveProps` method

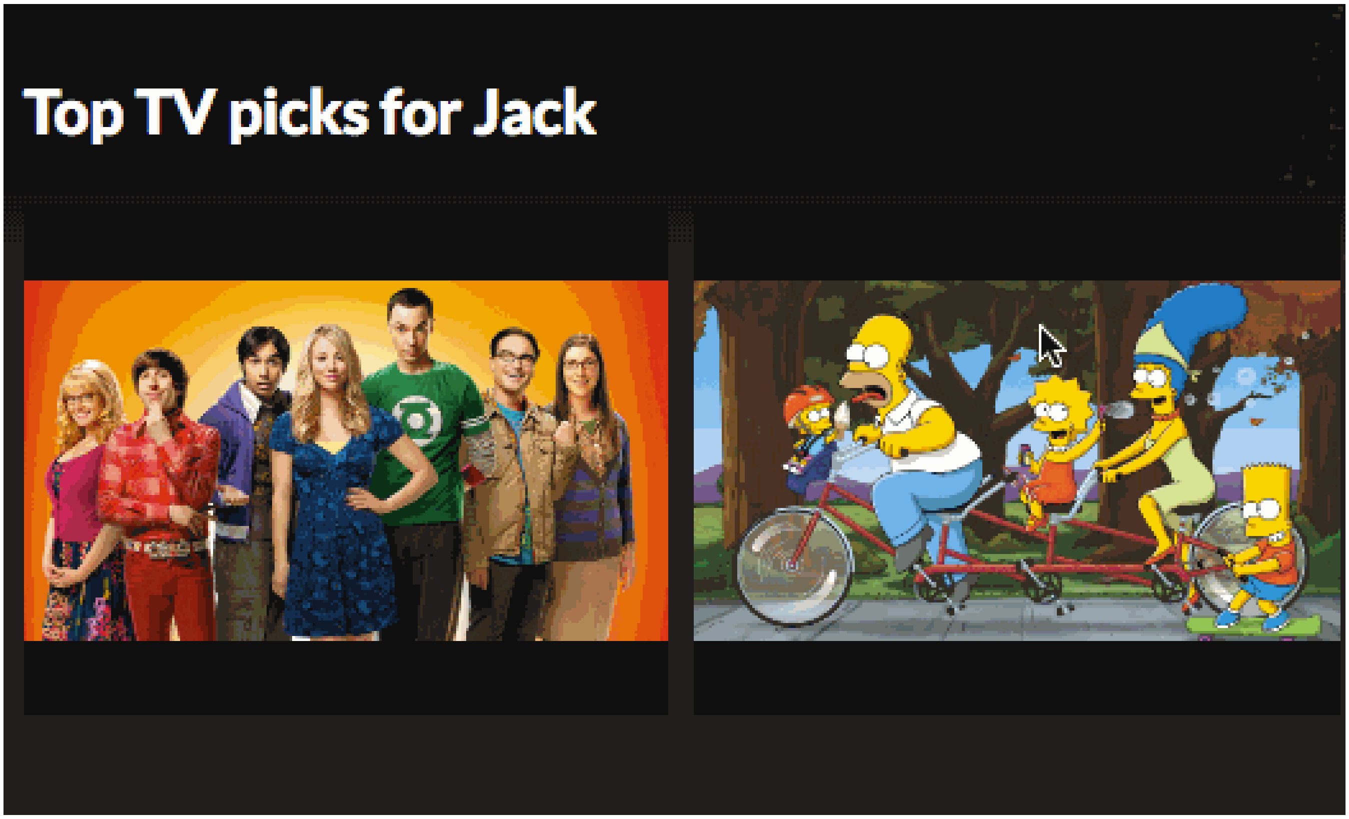
Our `TitleList` component implements another 'lifecycle hook' method called `componentWillReceiveProps`. The `componentDidMount` is useful for the first time a component is rendered, but what if we receive new data from our `App` component and need to re-render our component? This is where the `componentWillReceiveProps` method comes in handy. In our `App` component we have `this.state.searchUrl` which is passed down to the first `TitleList` component via the `url` prop. When this `prop` gets updated, the `componentWillReceiveProps` method is triggered. If our `TitleList` component receives a new URL (in this case a new search term was submitted), we want to call our `loadContent` method again to request new data from The Movie DB API.

```
componentWillReceiveProps : function(nextProps){
  if(nextProps.url !== this.props.url && nextProps.url !== ''){
    this.setState({mounted:true,url:nextProps.url},()=>{
      this.loadContent();
    });

  }
},
```

The `ListToggle` component

Our `ListToggle` component is a small icon container found within our `Item` component which is a child of our `TitleList` component. When we click on the icon, we are either indicating that we like a show or that we are no longer interested in it.



Using `data` attributes with `this.setState`

In order to toggle between the two different styles for our icon, we give the `ListToggle` state object a `boolean` and call it `toggled`. We use the `getInitialState` method to set the initial value of `toggled`:

```
getInitialState: function() {
  return({ toggled: false })
},
```

We add an `onClick` attribute to our outer `div` in our render function. We also have use a `data` attribute which gets the value of `this.state.toggled`. We will use this `data-toggled` attribute in the next section when we discuss how to style the icon with CSS.

```
<div onClick={this.handleClick} data-toggled={this.state.toggled} classNam
```

What is a `data` attribute?

> HTML5 introduces a new attribute valid for use in HTML elements -- the `data` attribute. Rather than using the `id` or `class` attribute to store information about an element, we can now use the `data` attribute to store extra information about our element that isn't necessarily related to the **style** of the element. We can use any lowercased name prefixed with `data-` to create a `data` attribute and assign it a string value.

We assign the `onClick` attribute the `handleClick` function. In the handleClick function we toggle the boolean between `true` and `false` :

```
  handleClick: function() {
    if(this.state.toggled === true) {
      this.setState({ toggled: false });
    } else {
      this.setState({ toggled: true });
    }

  },
```

Now, our `data-toggled` attribute will get updated with a `true` or `false` value

Using CSS `flexbox`

Our CSS stylesheet has a few lines of code for the initial styles of the icon. The icon itself is white and centered in the middle of the `.ListToggle` parent container. It has a height and width of `32px` Our icon element `<i>` has a couple of CSS styles that are newer -- the `display: flex` , `align-items:center` and `justify-content:center` styles. These three styles are part of the new CSS3 Flexible Box or flexbox layout mode. Using flexbox makes arranging elements on a page more predictable given that we now have many different screen sizes to manage when building web applications. When we specify the `display:flex` style, then all the direct children of that element will have access to flexbox styles. We give our `<i>` element two other styles, `align-items:center` and `justify-content` center so that the content inside the `<i>` element will be exactly in the center. The `justify-content:center` centers the content horizontally within the container and the `align-items:center` centers the content vertically within the container.

```
.ListToggle div i {
  display: -webkit-box;
  display: -webkit-flex;
  display: -ms-flexbox;
  display: flex;
  -webkit-box-align: center;
  -webkit-align-items: center;
      -ms-flex-align: center;
          align-items: center;
  -webkit-box-pack: center;
  -webkit-justify-content: center;
      -ms-flex-pack: center;
          justify-content: center;
  height: 32px;
  width: 32px;
}
```

We use two different icons depending on whether or not the user clicks on the icon. The two icons are stacked one on top of the other.

```
<div onClick={this.handleClick} data-toggled={this.state.toggled} classNam
```

The `div` that surrounds the two icon has a height of 64px and a width of 32px, positioned absolutely. Having this `div` twice the height of the width will come into play when the user clicks the icon and we change the styles.

```
.ListToggle div {
  position: absolute;
  top: 0;
  left: 0;
  height: 64px;
  width: 32px;
  -webkit-transition: .125s ease;
  transition: .125s ease;
}
```

Our `.ListToggle` element which wraps the two icons and their parent `div` container has a white border and a height and width of 32px, which without the `border-radius` style would make it a perfect square. Giving our `.ListToggle` element a `border-radius:50%` will make it a circle.

```
.ListToggle {
  border: 2px solid rgba(255, 255, 255, 0.2);
  width: 32px;
  height: 32px;
  font-size: 16px;
  border-radius: 50%;
  overflow: hidden;
  position: absolute;
  right: 20px;
  top: 20px;
  opacity: 0;
}
```

When a user hovers over the icon or clicks the icon, the styles change. We use CSS **attribute selectors** to change the style of our icon when a user clicks on it. To target elements that have a `data-toggled` attribute set to true we use this syntax:

```
.ListToggle[data-toggled="true"] {
  background: #e50914;
  border: 2px solid #e50914;
}

.ListToggle[data-toggled="true"] div {
  top: -32px;
}
```

And when a user hover overs the icon we use similar styles like this:

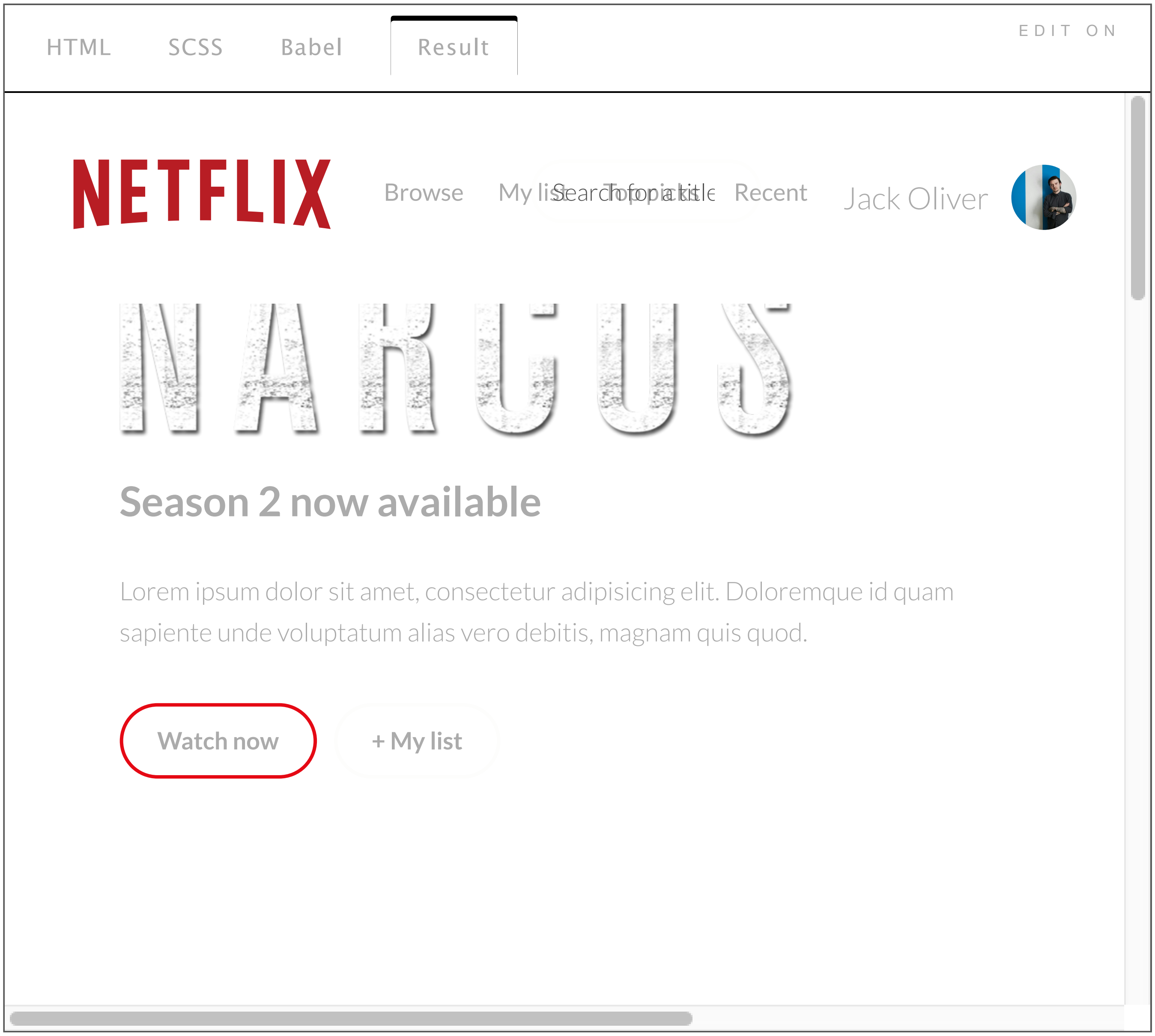
```
.ListToggle:hover {
  border: 2px solid #ffffff;
}

.ListToggle:hover div {
  top: -32px;
}
```

This is where having the `div` that is twice the height of the icons comes into play. Only half of the `div` is actually visible, since the outer `.ListToggle` element only has a height of `32px`. When we set `top:-32px` we shifting which portion of the `div` is visible. So, the top `<i>` element is visible when we set `top:-32px` and the bottom `<i>` element is visible when we set `top:0px`

Try it out!

Check out the Codepen example:



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The complete source for this article is also available on Github here (https://github.com/fullstackreact/react-daily-ui).

To start the app, download the code, `cd` into the project directory and type:

```
npm install
npm start
```

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Sophia Shoemaker

Sophia Shoemaker became addicted to React in 2014. She is a full stack developer but React is her technology of choice. She loves working on her pet project Shop Sifter (http://shopsifter.co) and editing the Fullstack React Newsletter (http://newsletter.fullstackreact.com).

Recently, she became a mentor at Hackbright Academy and is excited to encourage and empower women looking to get involved in programming. When she isn't cobbling code, she can be found flying in her husband's Beechcraft Bonanza and playing with her 2 kids.

Connect with Sophia on Twitter at @wisecobbler (http://twitter.com/wisecobbler).

Jack Oliver

Hi, I'm Jack! I'm a Developer & Designer living in Stockholm, Sweden. I've worked with super cool people; from Mercedes-Benz, Farfetch, NotOnTheHighStreet, and Mimecast, and am currently building cool stuff at Observify. Part-time photographer, full-time joker. I'm currently doing 100 days of React on Codepen check it out here. (http://codepen.io/collection/DoLZRm)

Connect with me on twitter @mrjackolai (http://twitter.com/mrjackolai).

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