REACT.JS

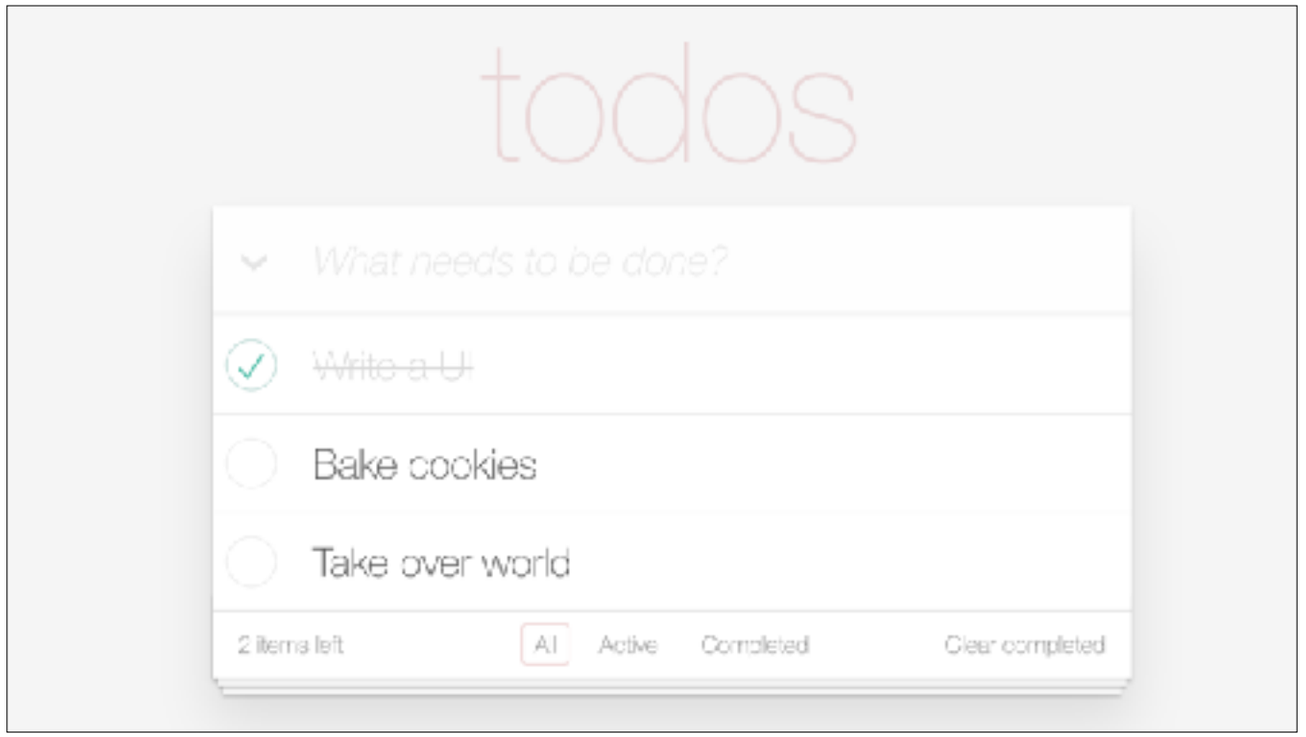
A JavaScript library for building user interfaces

PROBLEM: MAKING A USER INTERFACE IS HARD

WHY: SO MUCH STUFF TO REMEMBER!

STATE + VIEW

- Every user interface has data (which we often call “state”), and presents something based on that data
- Any change to the underlying data should be reflected in the view



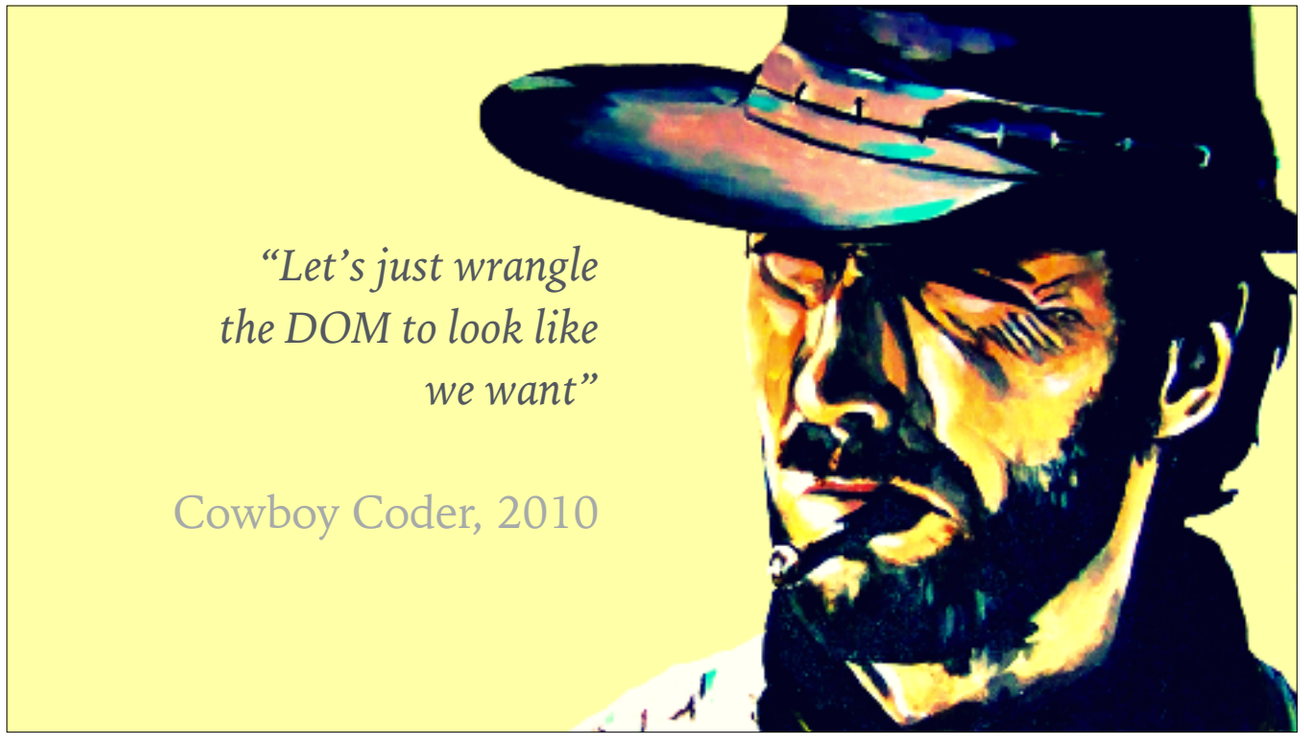
What is the “data” in this app

- list of todos
    - whether a todo is active or completed
- whether we’re showing all, active, or completed todos
- number of items (2 items left)
- even the text that’s entered in the input

```
{
  "todos": [
    {"text": "Write a UI", "status": "completed"},
    {"text": "Bake cookies", "status": "active"},
    {"text": "Take over world", "status": "active"}
  ],
  "showStatus": "all"
}
```


Here is how we could represent this app as data, or “state”
(total items is the length of todos after we filter for just the active)

Question: how to represent this data in the DOM?


*“Let’s just wrangle
the DOM to look like
we want”*
Cowboy Coder, 2010

ADD A TODO

- Push to our “todos” array
- Append a new element to the DOM

WAIT

- Push to our “todos” array
- Does the “status” of the todo match what we’re currently showing?
  - Yes: Append a new element to the DOM
  - No: Okay, don’t append a new element to the DOM

WAIT

- Push to our “todos” array
- Does the “status” of the todo match what we’re currently showing?
  - Yes: Append a new element to the DOM
  - **No: Okay, don’t append a new element to the DOM**

Let’s say that we’re currently only showing completed, and we add a new, active todo

OKAY, NOW WE SWITCH BACK TO ALL

- **Change the “showStatus” to “all”**
- **Check our list of “todos” and add any that aren’t showing back in**
  - But make sure they’re in the right order!
    - Don’t just wipe the slate clean though - that’s bad for performance!
  - Also make sure to change the highlighting so that “All” looks selected

OKAY, SO REMEMBERING TO CHANGE THE VIEW AFTER WE CHANGE THE DATA IS HARD...

...WHAT IF WE GOT RID OF THE DATA?

“Let’s put the todo data on the DOM node”

Cowboy Coder, 2010

Sorry, cowboy…bad for so many reasons. Just a few:

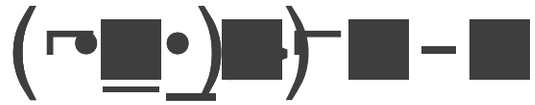
* Accessing the DOM and manipulating it is a computationally expensive operation. Every time you need to do something based on your data, you need to reach out and grab all of the DOM elements every time.

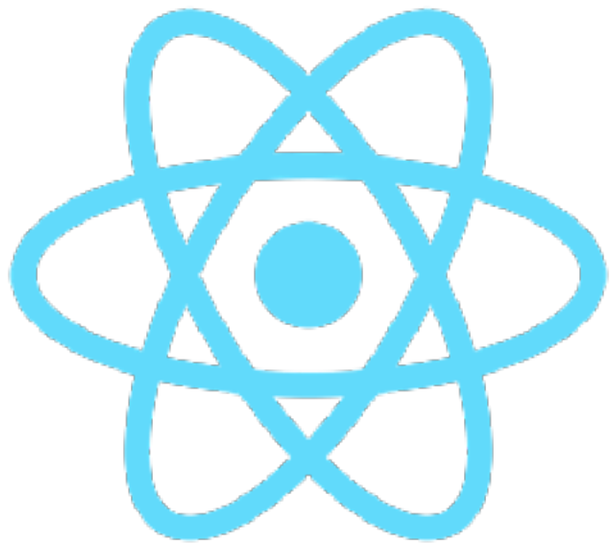
* Your data is not portable because it's not data - it's baked into the DOM

* It will be insanely difficult for anyone to figure out what's going on, including your future self

OKAY, SO WHAT IF WE COULD JUST CHANGE THE DATA, AND THE VIEW WOULD...

...REACT?





REACT

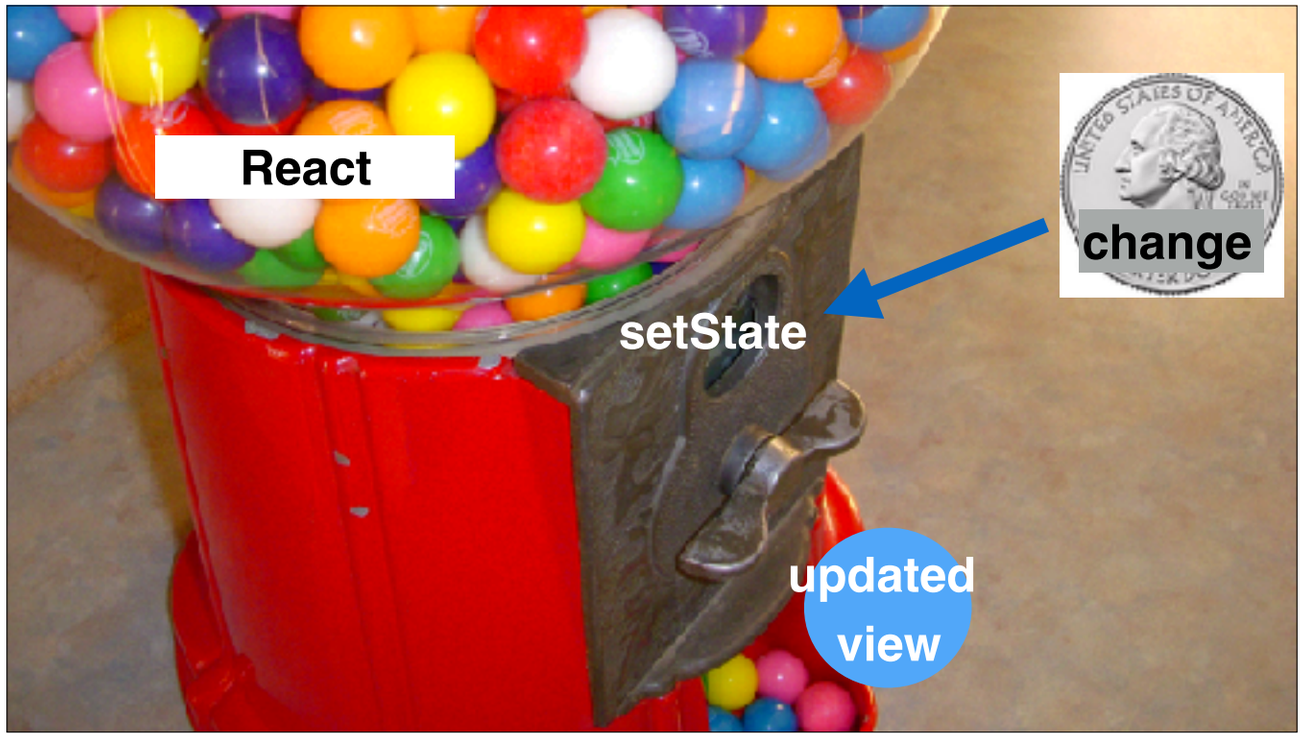
- **Data is called “state”**
  - More precisely: “state” is data that *changes*
- **When you update “state”, React re-renders the view for you**
- **React re-renders the view in a performant way**

Get out of here, cowboy coder! You are wrong!

SET STATE

- **We do not directly mutate “state”**
  - **Ex: we DO NOT say** `state.showStatus = “all”`
- **We use a method called** `setState`
  - **Ex. we DO say** `this.setState({showStatus: “all”})`
- **Why? So that React can handle things intelligently if multiple updates happen all at once!**

Think of it as “requesting an update” from React, as opposed to trying to force it.
Other reasons:
single gateway easier than many gateways
immutable data easier to reason about
batch updates


React
change
setState
updated
view

WHEN YOU SET STATE, REACT WILL UPDATE THE VIEW

And this is the **only** way for the view to change

LET'S WRITE YOUR FIRST COMPONENT!