goto; chicago

The Future of React

Peter Piekarczyk

ReasonML 🔥 The Future of React

Peter Piekarczyk
Co-founder, Draftbit

PIES • CARS • CHICKS

Peter Piekarczyk

- Polish
- Loves to Cycle
- ReasonML Lover
- Expo / React Native Lover
- Loves Plants (@petersplantss)
- Y Combinator Alumn
- Co-Founder of Draftbit

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Draftbit is a platform to help you build mobile apps visually

1. Scan QR Code
2. Drag Component
3. Export Code

Rentbit
New Screen
Live Preview
View Code
Help
Studio
Add
Screens
Themes
Settings
Assets
Profile
Logout
Screen
Container
Image
Text
Text
New Screen
Draftbit (Dark)
SCREEN
New Screen
Config
Alignment
Layout
Direction: inherit | ltr | rtl
Flex Direction: Column
Justify Content: Flex Start
Align Items: Stretch
Align Self: Auto
Align Content: Stretch
Basis: auto
Grow: 0
Shrink: 0
Flex Wrap: [✓ no wrap] | wrap | wrap reverse
iPhone X — 12.2
12:26
Want to get alerts?
We'll alert you on your bookings, listing recommendations and more!

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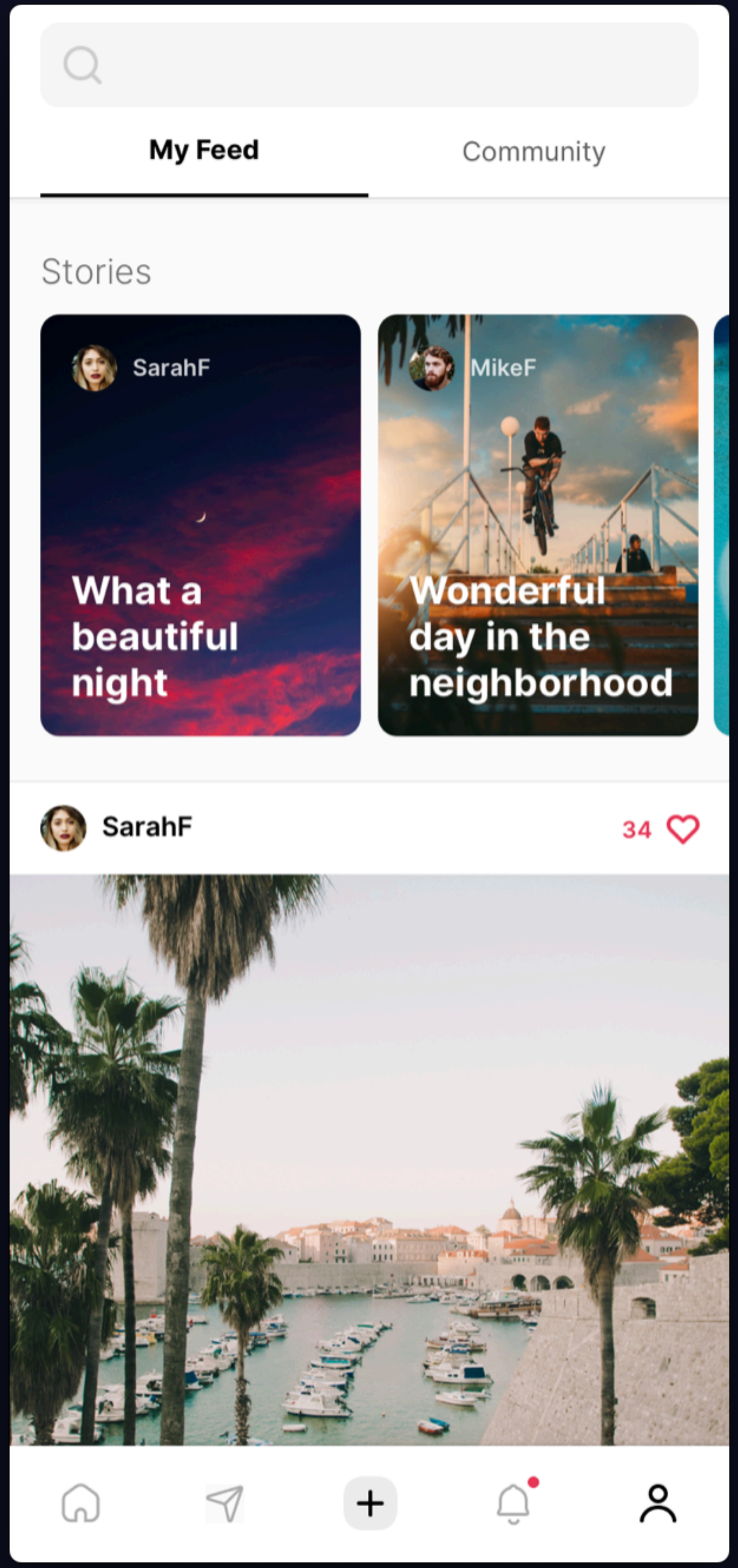

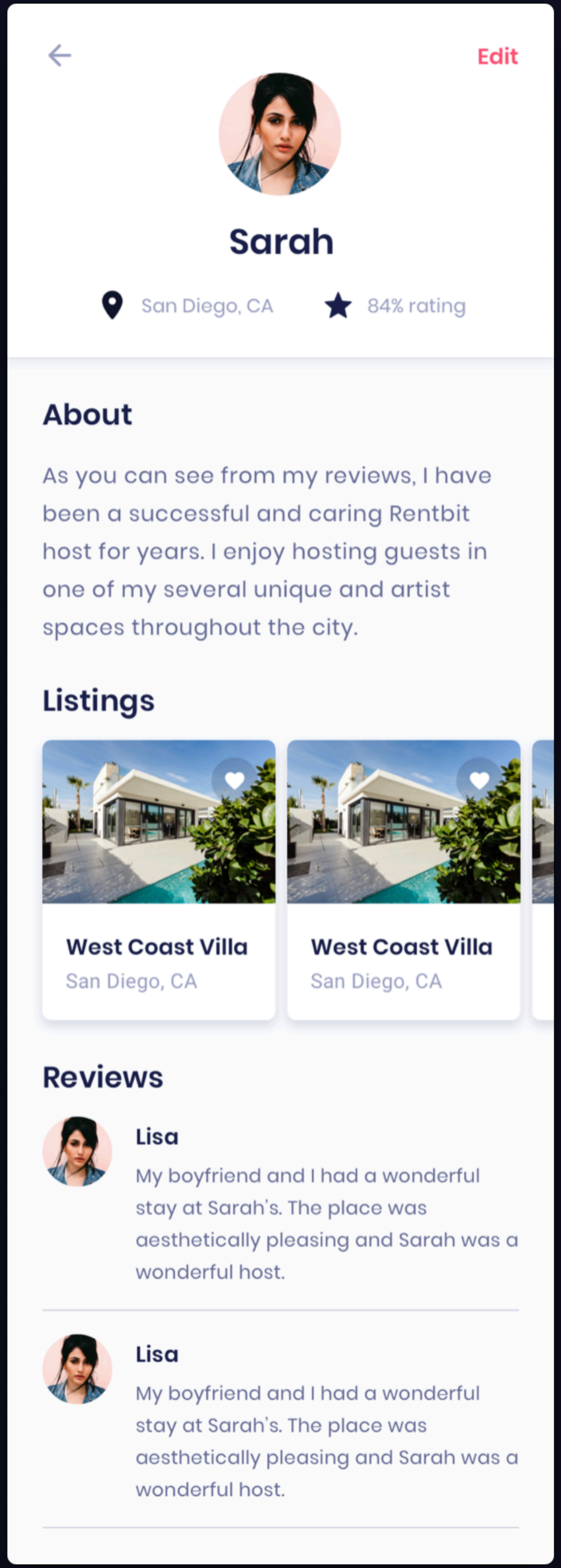

About

As you can see from my reviews, I have been a successful and caring Rentbit host for years. I enjoy hosting guests in one of my several unique and artist spaces throughout the city.

Listings

West Coast Villa
San Diego, CA

West Coast Villa
San Diego, CA

Reviews

Lisa
My boyfriend and I had a wonderful stay at Sarah's. The place was aesthetically pleasing and Sarah was a wonderful host.

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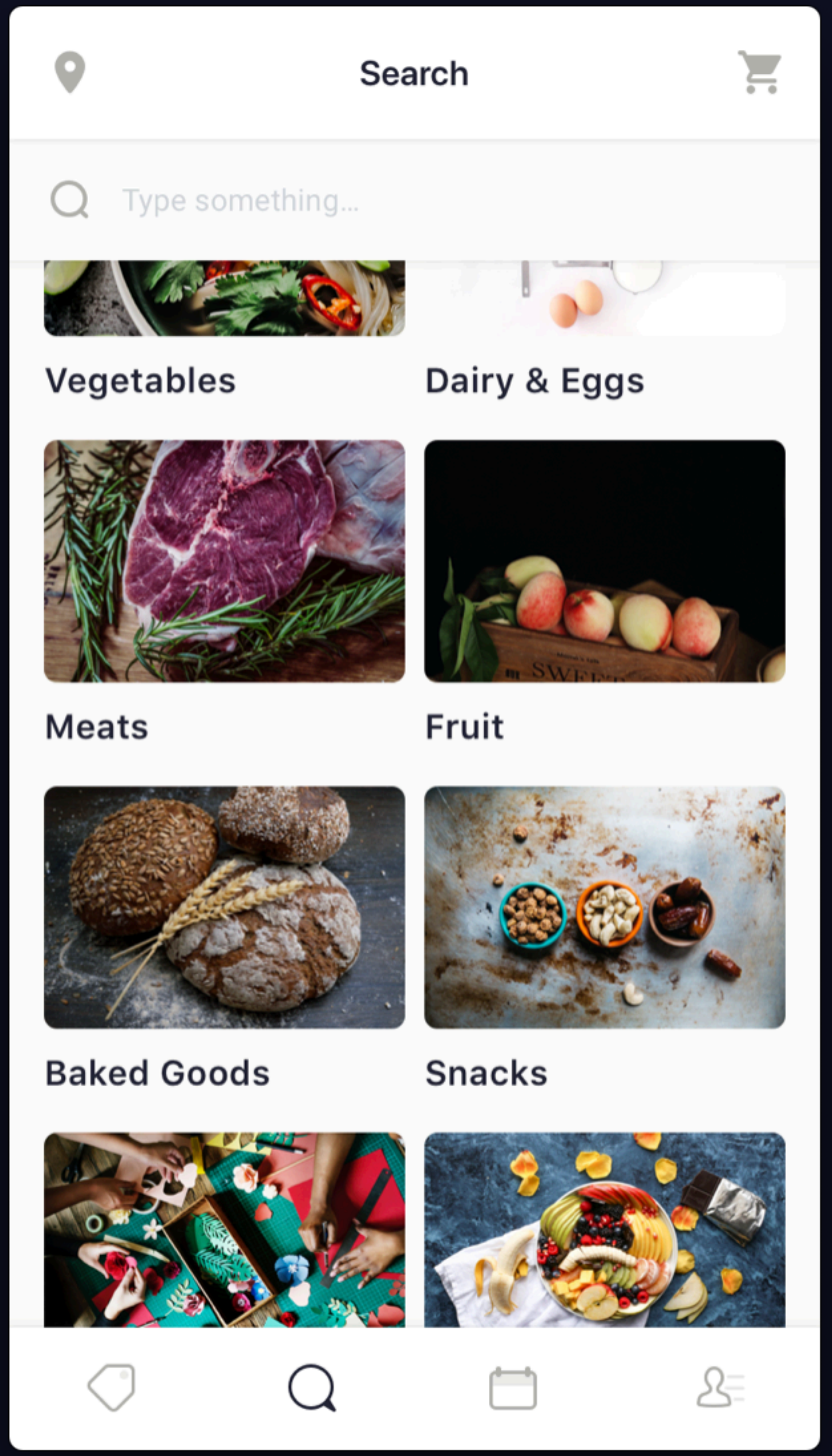

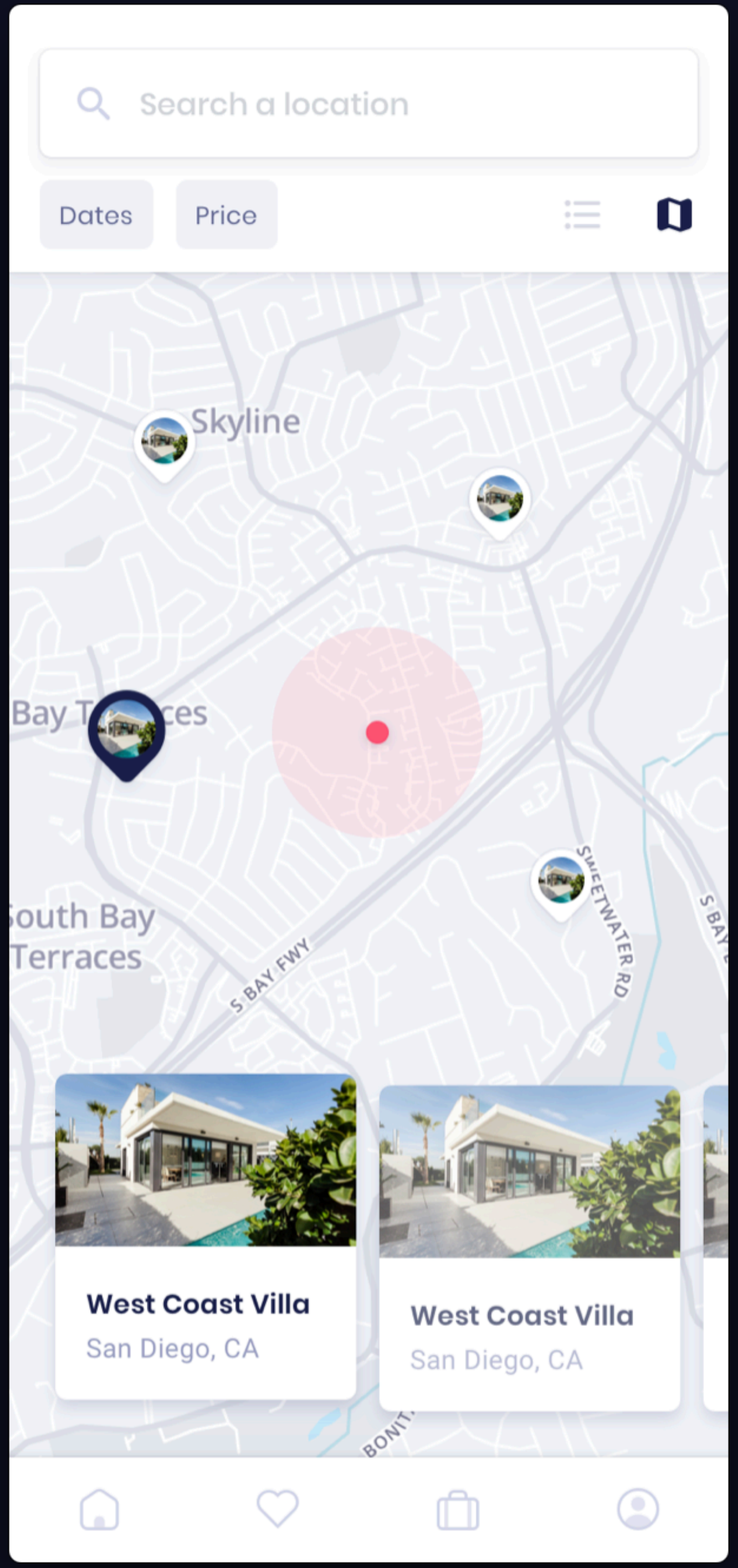

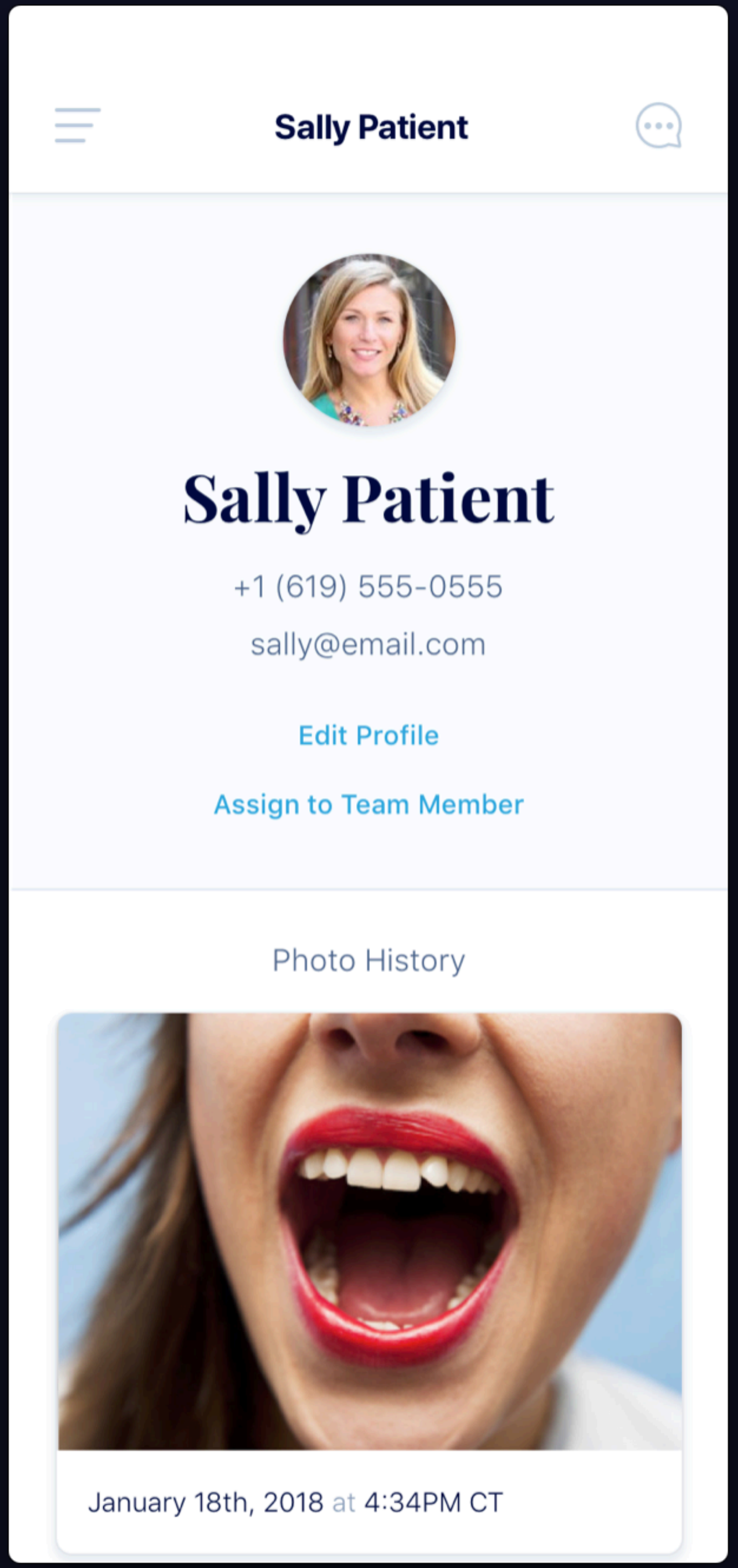

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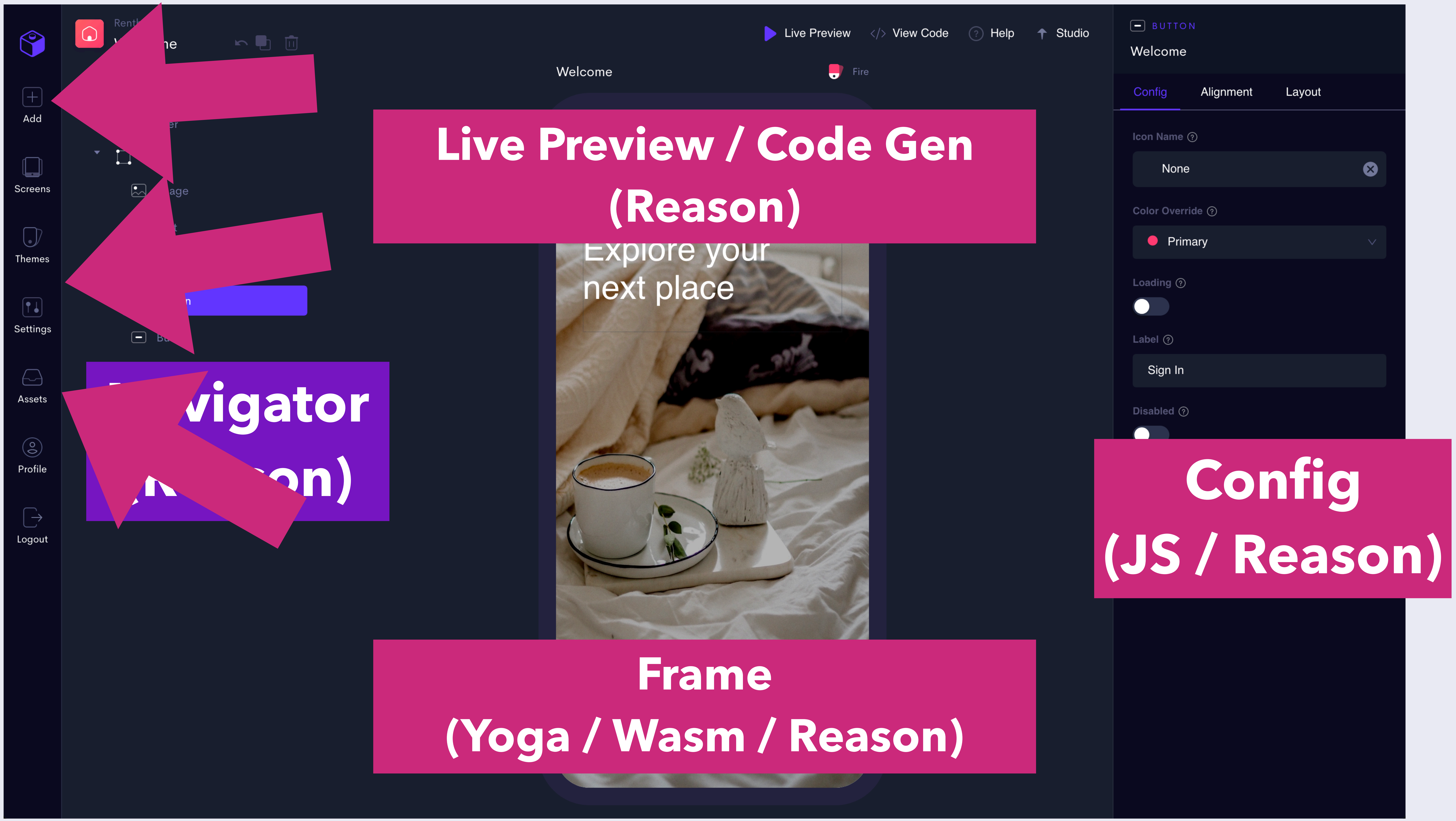
@peterpme



Live Preview / Code Gen (Reason)

Navigator (Reason)

Config (JS / Reason)

Frame (Yoga / Wasm / Reason)

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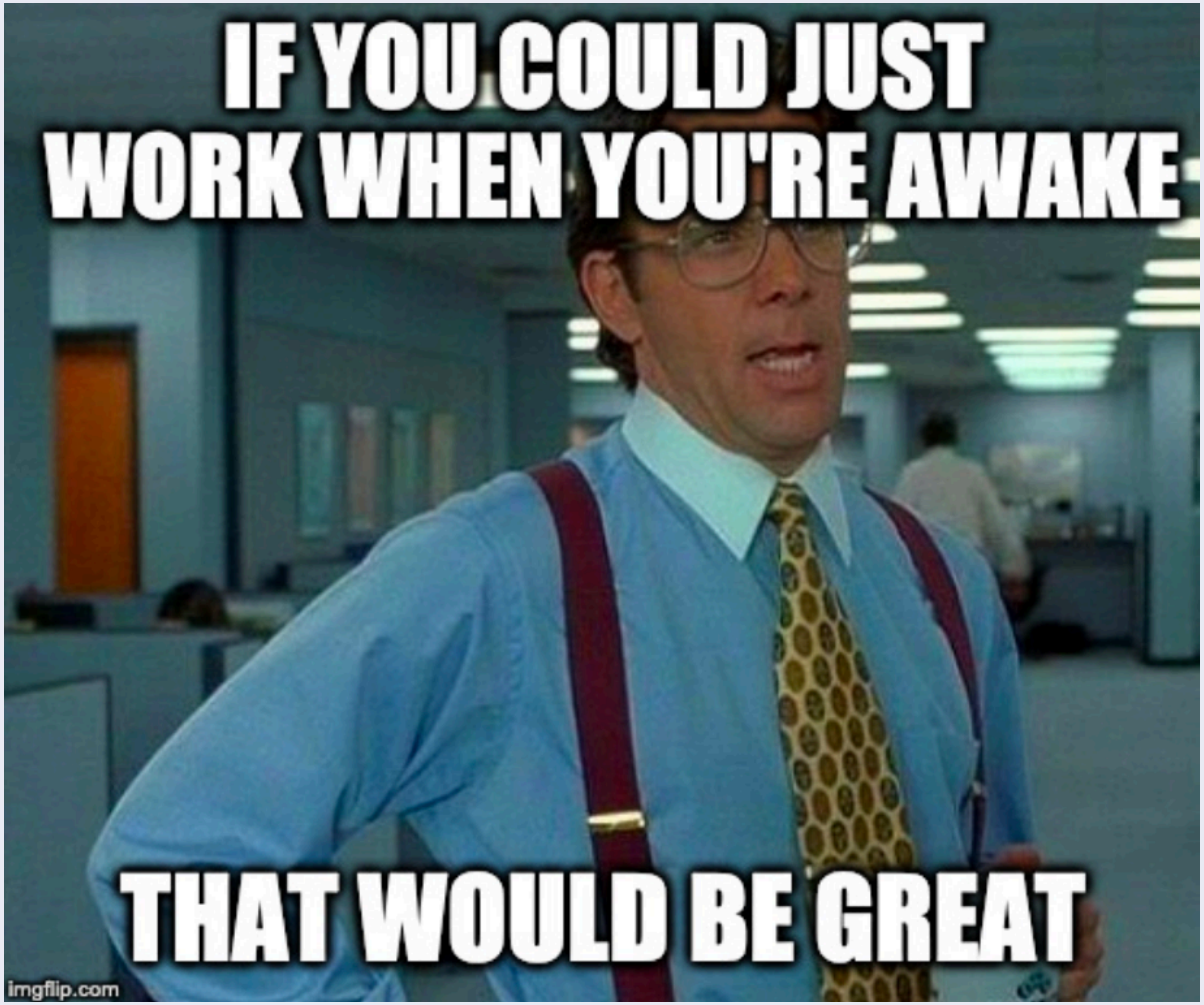
Early days at a startup are… hard

Draftbit needed to move faster to survive


IF YOU COULD JUST WORK WHEN YOU'RE AWAKE
THAT WOULD BE GREAT
imgflip.com

We gave Reason a shot & never looked back

Draftbit Stack

- React & ReasonML
- Web Assembly
- Expo
- GraphQL & Apollo
- Postgres

We *used* to start with Javascript

WHERE ARE YOU STUCK AT?
JAVASCRIPT
I FEEL YA THERE
imgflip.com

“Hey Peter…”

“I think I broke something…”

15 min & 10 console.log’s later…

Config.apiUrl

vs.

Config.apiURL

Life Before 2015

Backbone

Gulp

MVC

RequireJS

Bower

jQuery

Angular

CoffeeScript

WHITE WATER RAFTING!!
TIGERS

Life After 2015

Flowtype

Babel

Prettier

React

Eslint

Typescript

Redux

Yarn

Immutable

What do you get when you take all that shit

& make it easy?

You get Reason

- Created by React creator
- Familiar Javascript syntax
- Battle-tested language
- Friendly compiler

What language was React *originally* written in?

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StandardML

What is Reason?

Javascript as a statically typed,

functional language, with a friendly compiler

& amazing developer productivity

If it compiles, it works 😃

What is OCaml?

A functional programming language

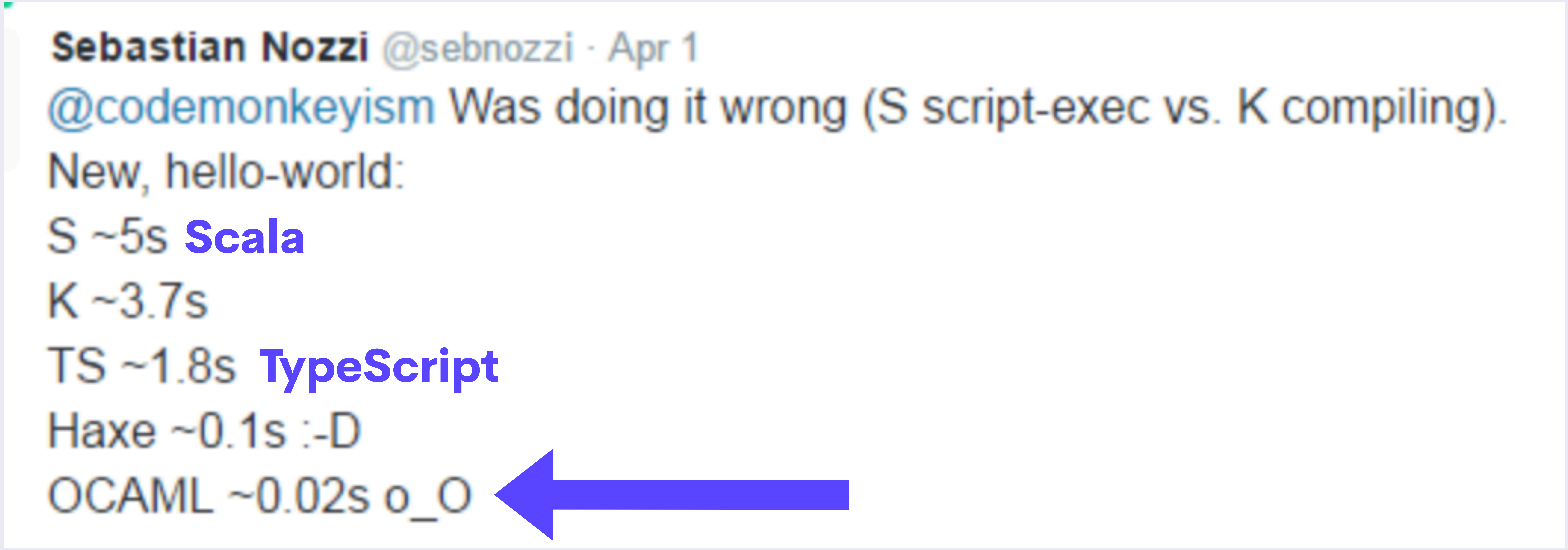
With twenty years of type theory,

Powerful pattern matching, functions

& a robust ecosystem of packages (OPAM)

- Compiles >10x faster than Babel
- Eliminates typical JS errors
- Easy to use within your existing JS app
- Compiled code is easy to debug

Fast AF Compile Times



Sebastian Nozzi @sebnozzi · Apr 1

@codemonkeyism Was doing it wrong (S script-exec vs. K compiling).

New, hello-world:

S ~5s **Scala**

K ~3.7s

TS ~1.8s **TypeScript**

Haxe ~0.1s :-D

OCAML ~0.02s o_O

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CRA 3.0

REASON

```
~/P/d/builder ❯❯❯ yarn start                    ~/P/d/builder ❯❯❯
```

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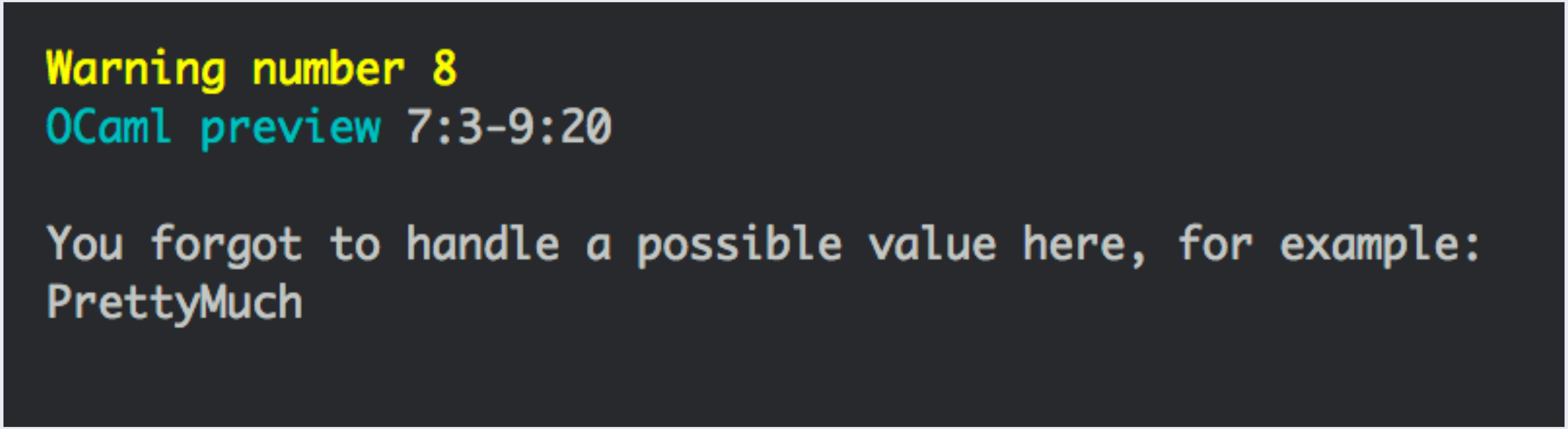
```
We've found a bug for you!
OCaml preview 2:15-26

The module or file IntMap can't be found.
- If it's a third-party dependency:
  - Did you list it in bsconfig.json?
  - Did you run `bsb` instead of `bsb -make-world`
    (latter builds third-parties)?
- Did you include the file's directory in bsconfig.json?
```



```
Warning number 8
OCaml preview 7:3-9:20

You forgot to handle a possible value here, for example:
PrettyMuch
```

What does a React component look like?

```
[@react.component]
let make = () => {
  <button> {React.string("Hello!")} </button>
};
```

Desugars to JSX

Similar, but a little different, right?

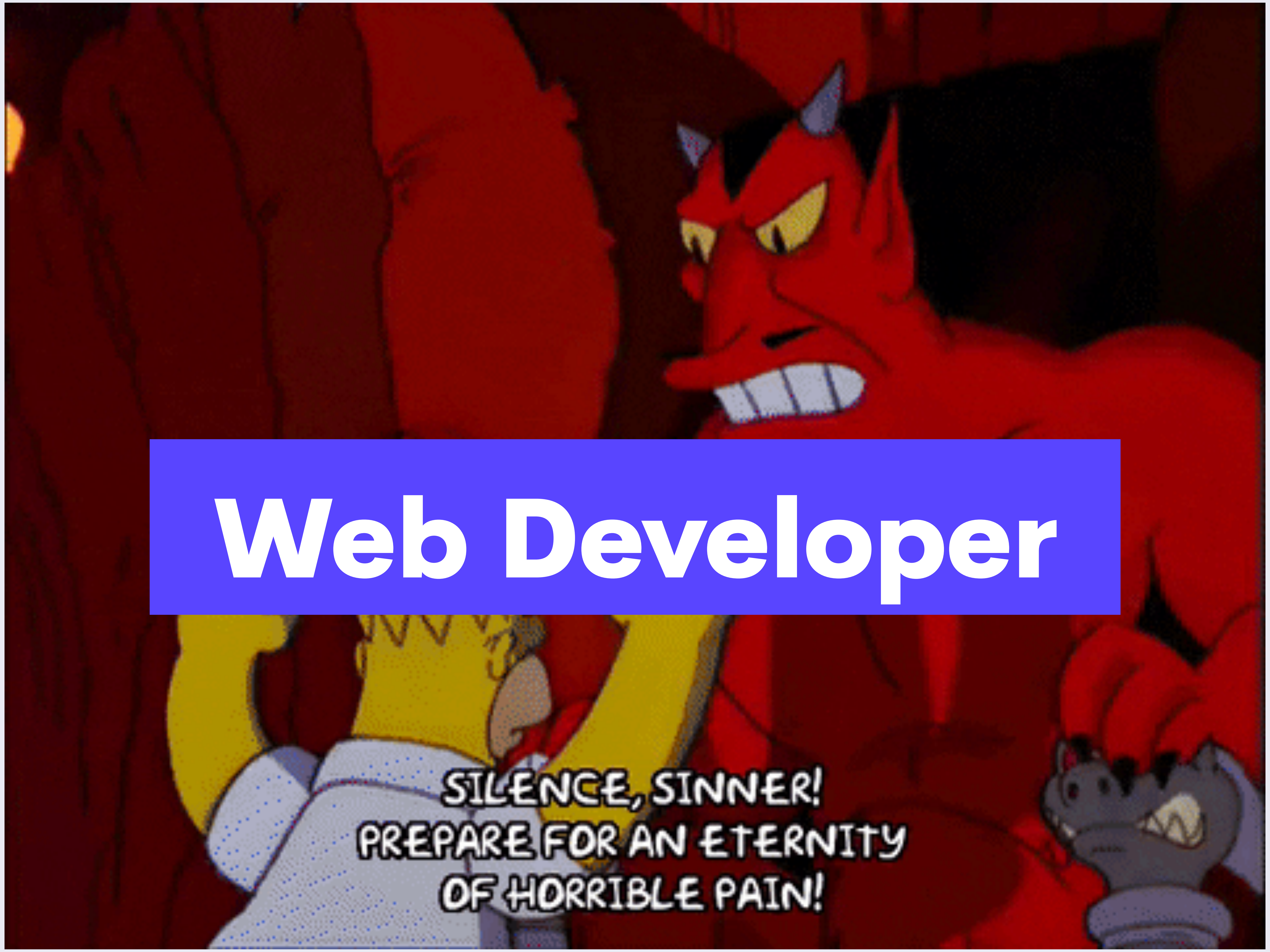
```
React.string("Hey There")
```

All your jsx is typed 😍

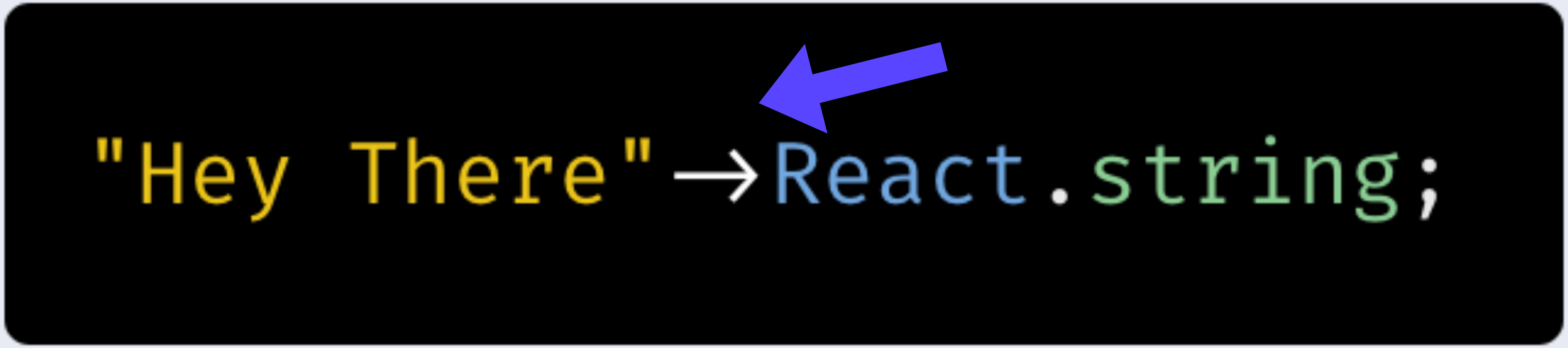
Why is this valuable?

Because uncertainty is the devil

We all know what uncertainty is already like ...



Web Developer



```
"Hey There"→React.string;
```

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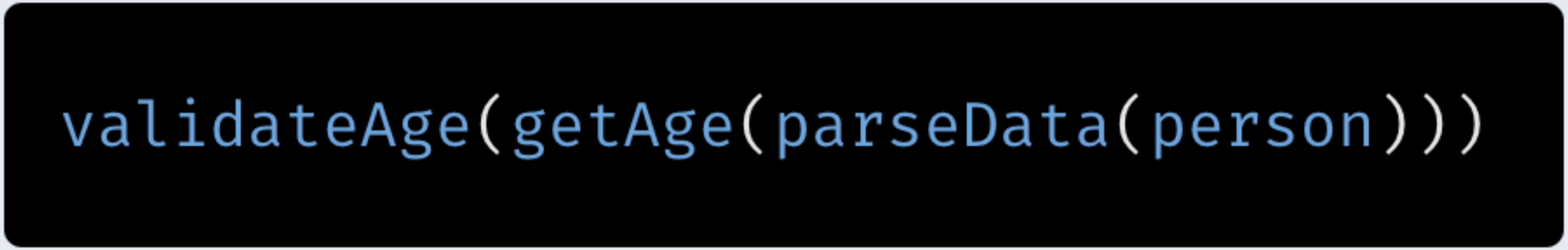
Pipe First makes it easy to read composable functions



```
validateAge(getAge(parseData(person)))
```

```
person
    →parseData
    →getAge
    →validateAge
```

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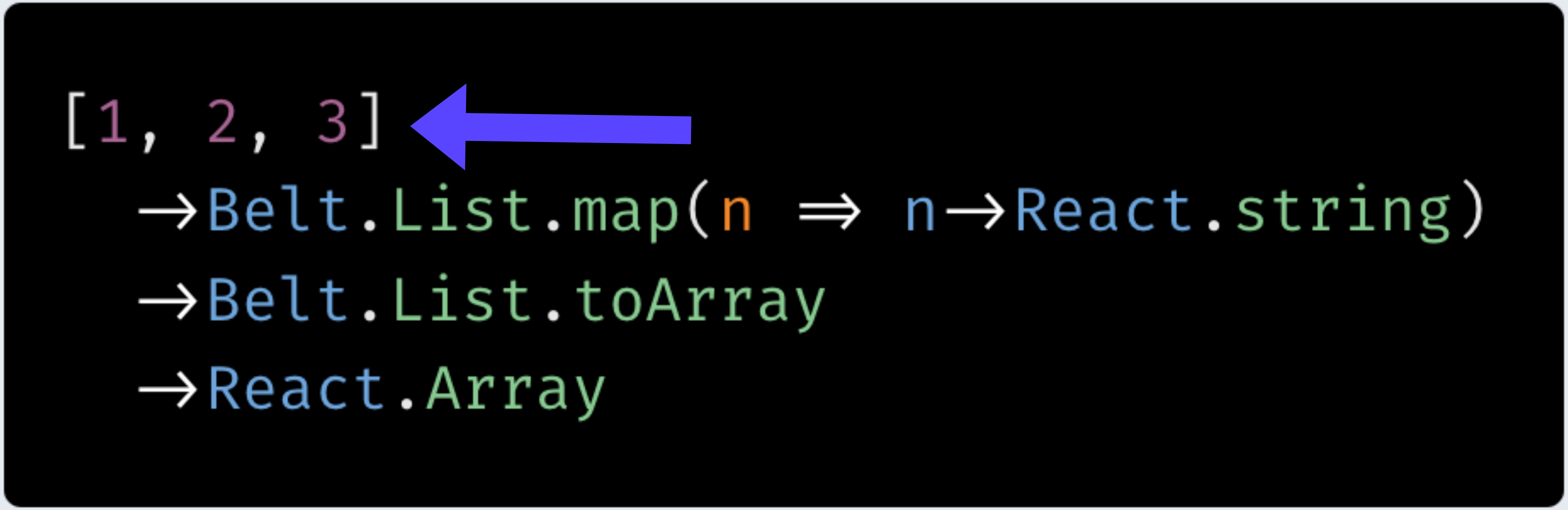

```
[1, 2, 3]
  ->Belt.List.map(n => n->React.string)
  ->Belt.List.toArray
  ->React.Array
```

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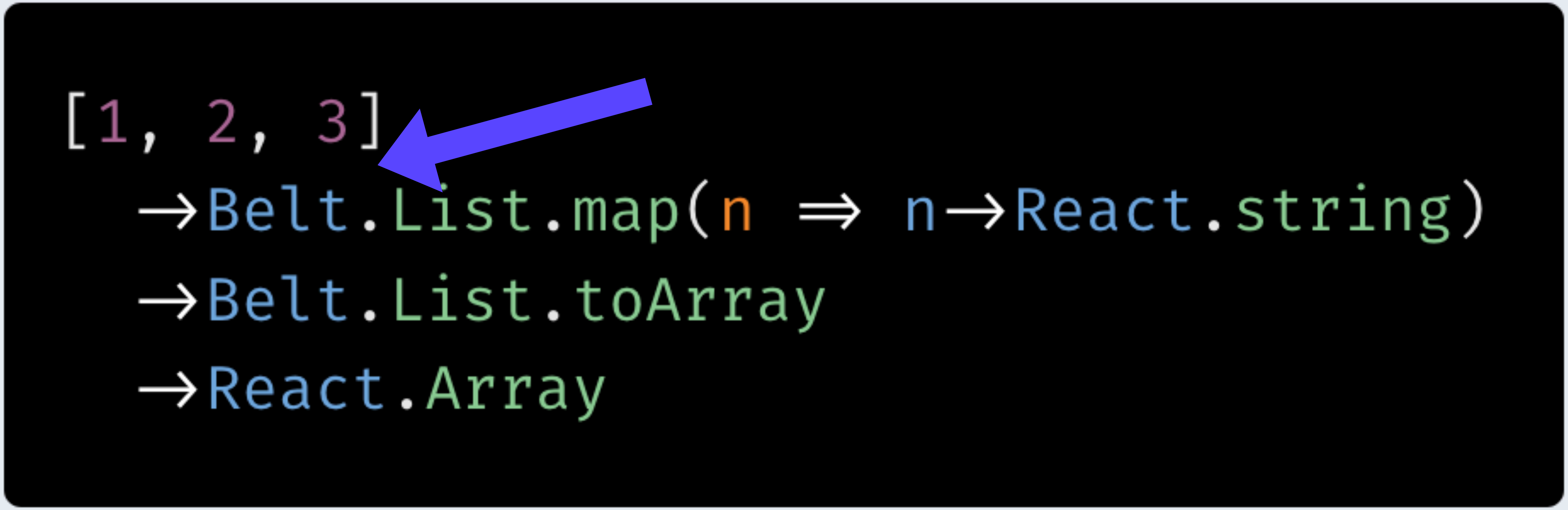
[1, 2, 3] is a List

Lists are immutable, homogeneous & fast AF



```
[1, 2, 3]
   ->Belt.List.map(n => n->React.string)
   ->Belt.List.toArray
   ->React.Array
```

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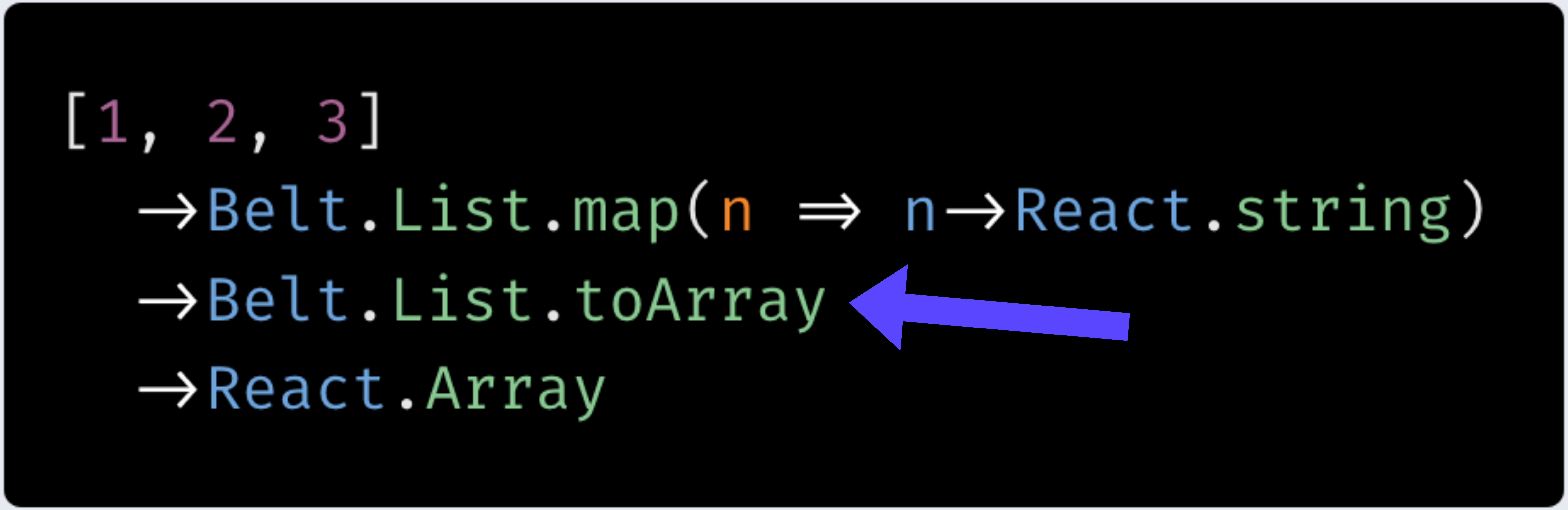
Belt is the standard library shipped with Reason

A built-in lodash just for Reason



```
[1, 2, 3]
  ->Belt.List.map(n => n->React.string)
  ->Belt.List.toArray
  ->React.Array
```

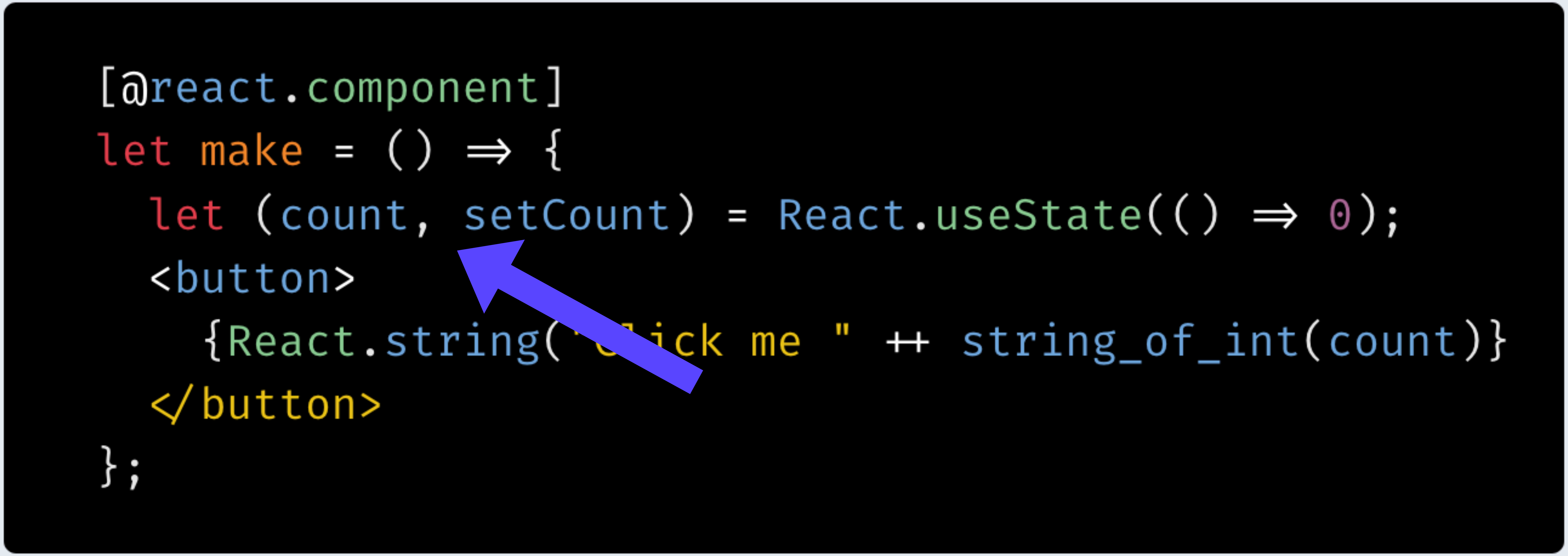
Convert your immutable list into an array

```
[1, 2, 3]
  →Belt.List.map(n ⇒ n→React.string)
  →Belt.List.toArray
  →React.Array
```

Convert your array into a React element

*both Lists & Arrays are supported

Hooks are the future



```
[@react.component]
let make = () => {
  let (count, setCount) = React.useState(() => 0);
  <button>
    {React.string("Click me " ++ string_of_int(count))}
  </button>
};
```

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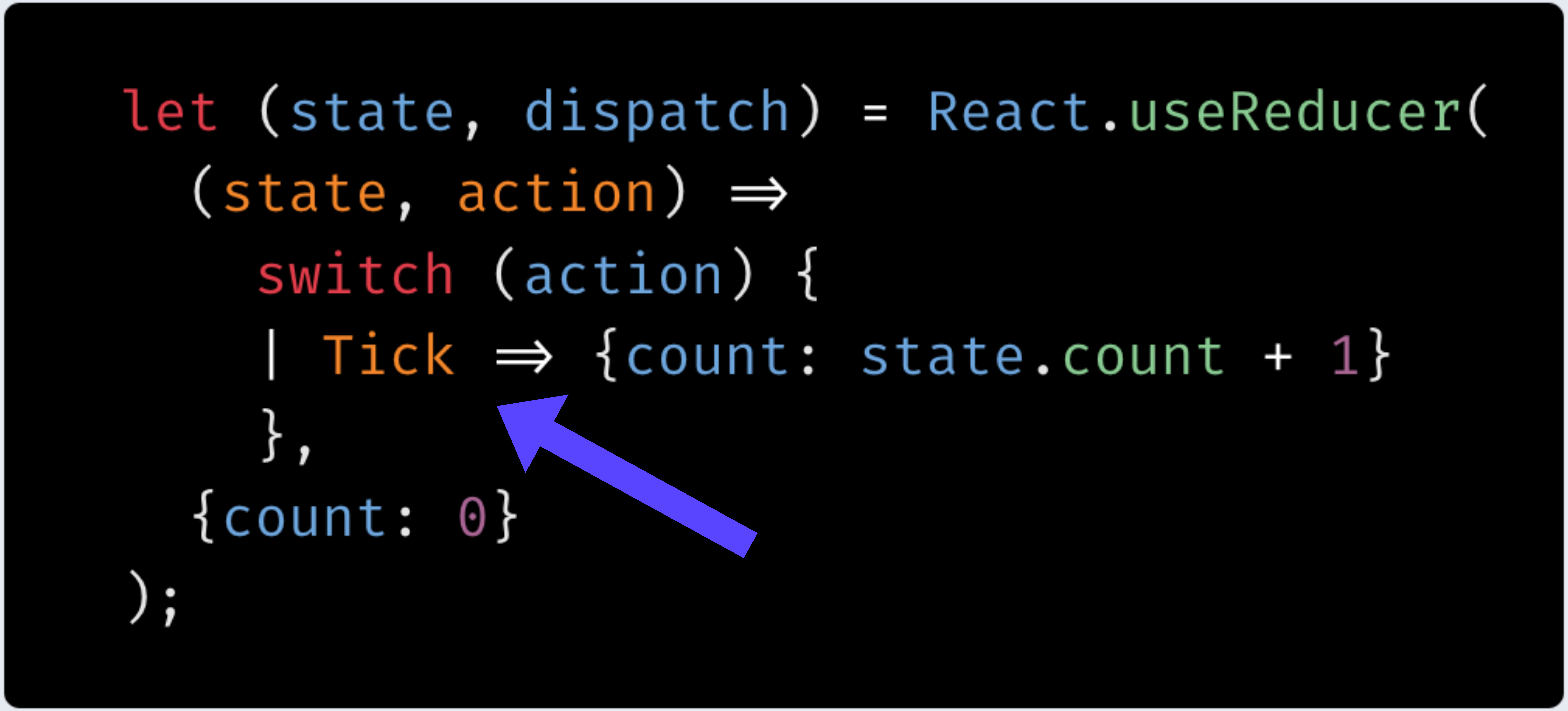
Tuples are immutable, ordered & heterogeneous

```
type coordinates = (float, float);
let chicago: coordinates = (41.88, -87.62);
let (lat, lng) = chicago;

// lat = 41.88
// lng = -87.62
```



```
let (state, dispatch) = React.useReducer(
  (state, action) =>
    switch (action) {
    | Tick => {count: state.count + 1}
    },
  {count: 0}
);
```

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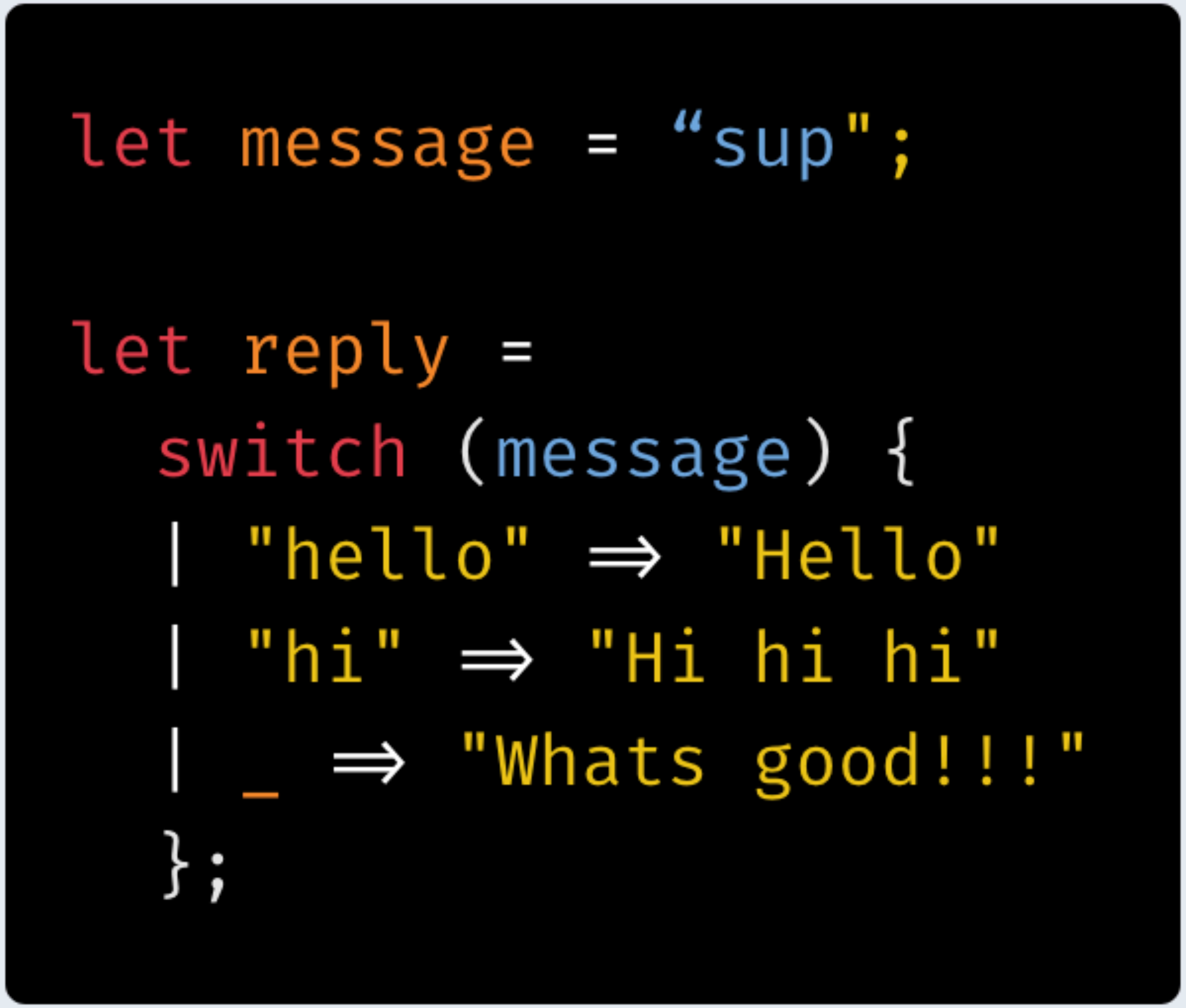
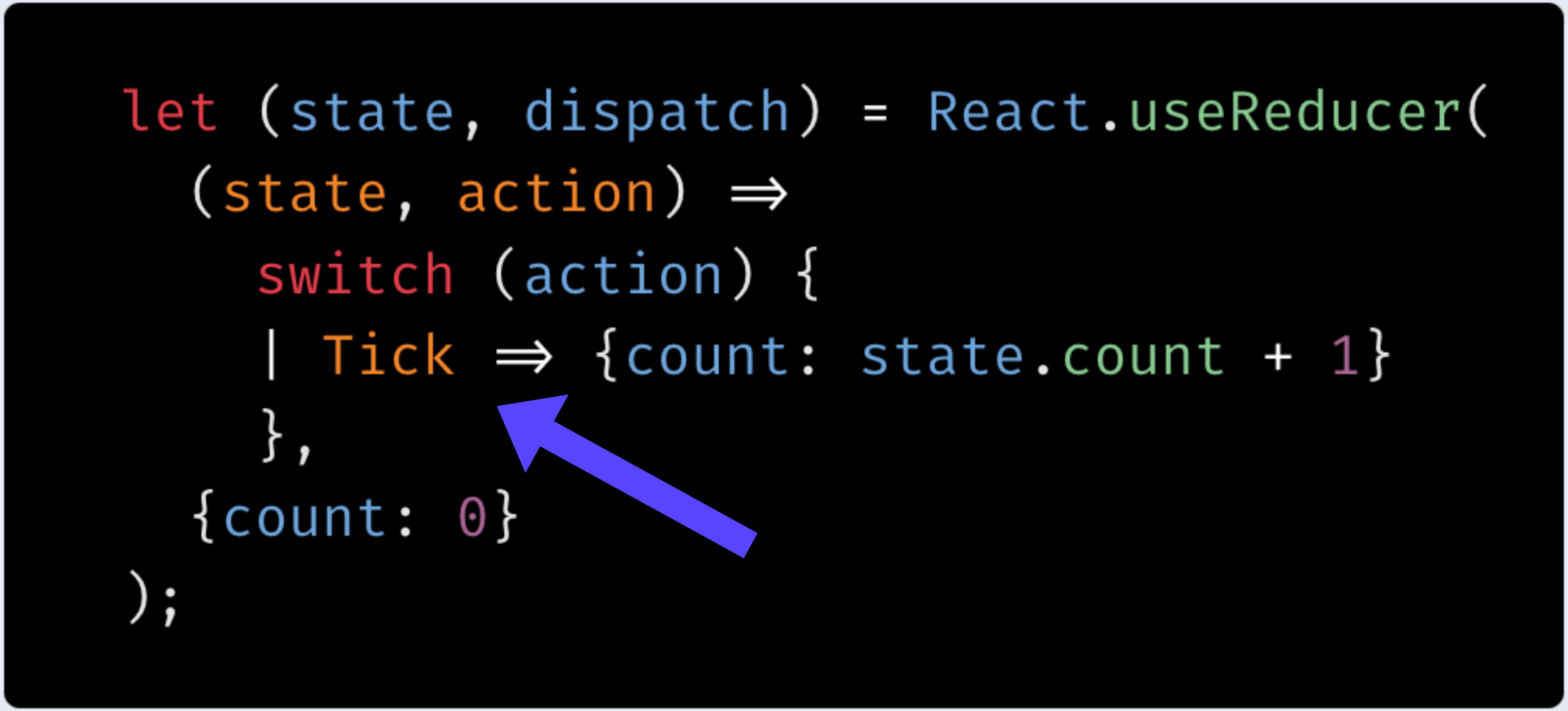
Pattern matching is a switch statement on steroids



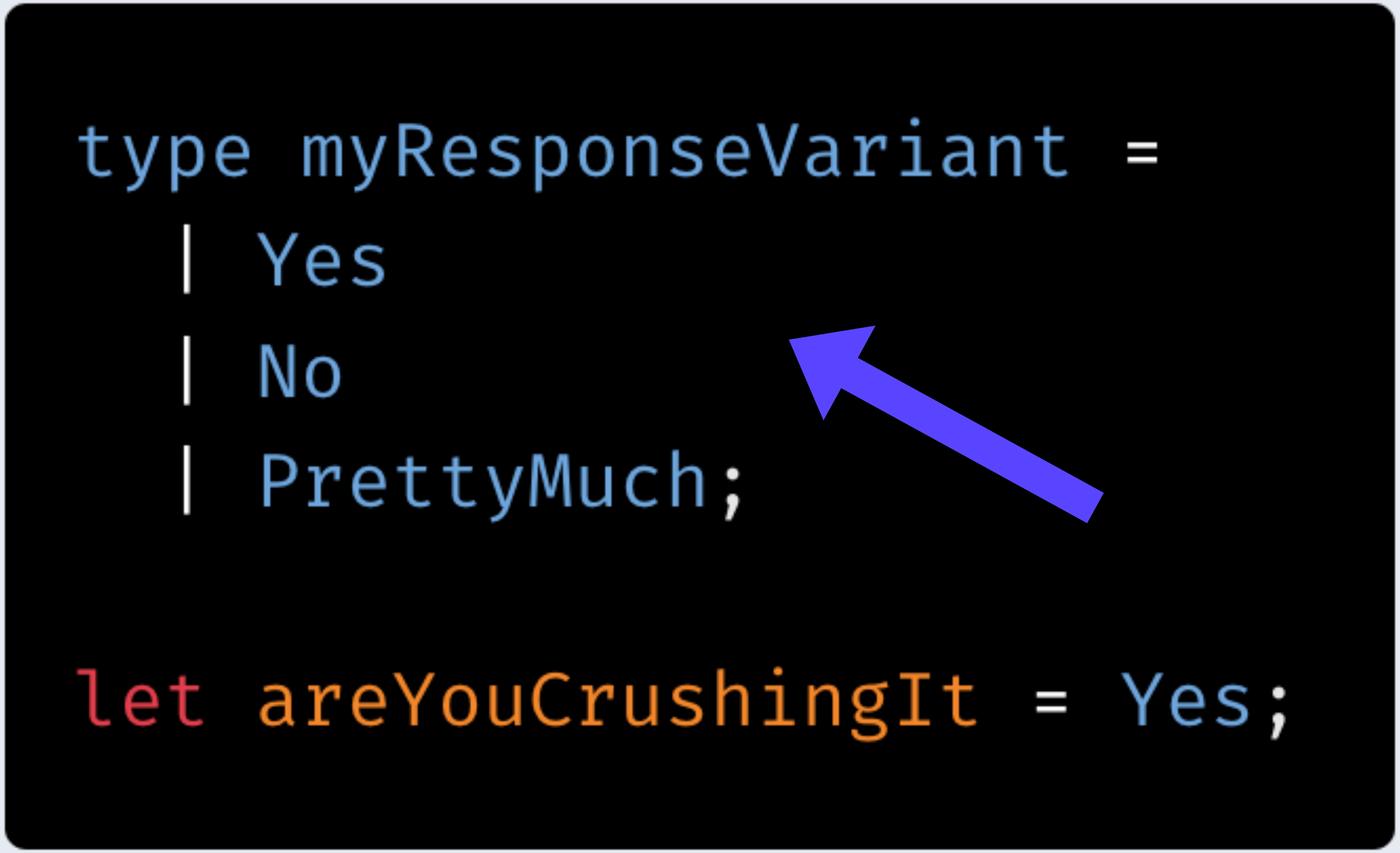
```
let message = “sup";

let reply =
  switch (message) {
  | "hello" => "Hello"
  | "hi" => "Hi hi hi"
  | _ => "Whats good!!!"
  };
```



```
let (state, dispatch) = React.useReducer(
  (state, action) =>
    switch (action) {
    | Tick => {count: state.count + 1}
    },
  {count: 0}
);
```

Why is Tick capitalized?

Tick is not a string, its a constructor



```
type myResponseVariant =
  | Yes
  | No
  | PrettyMuch;

let areYouCrushingIt = Yes;
```

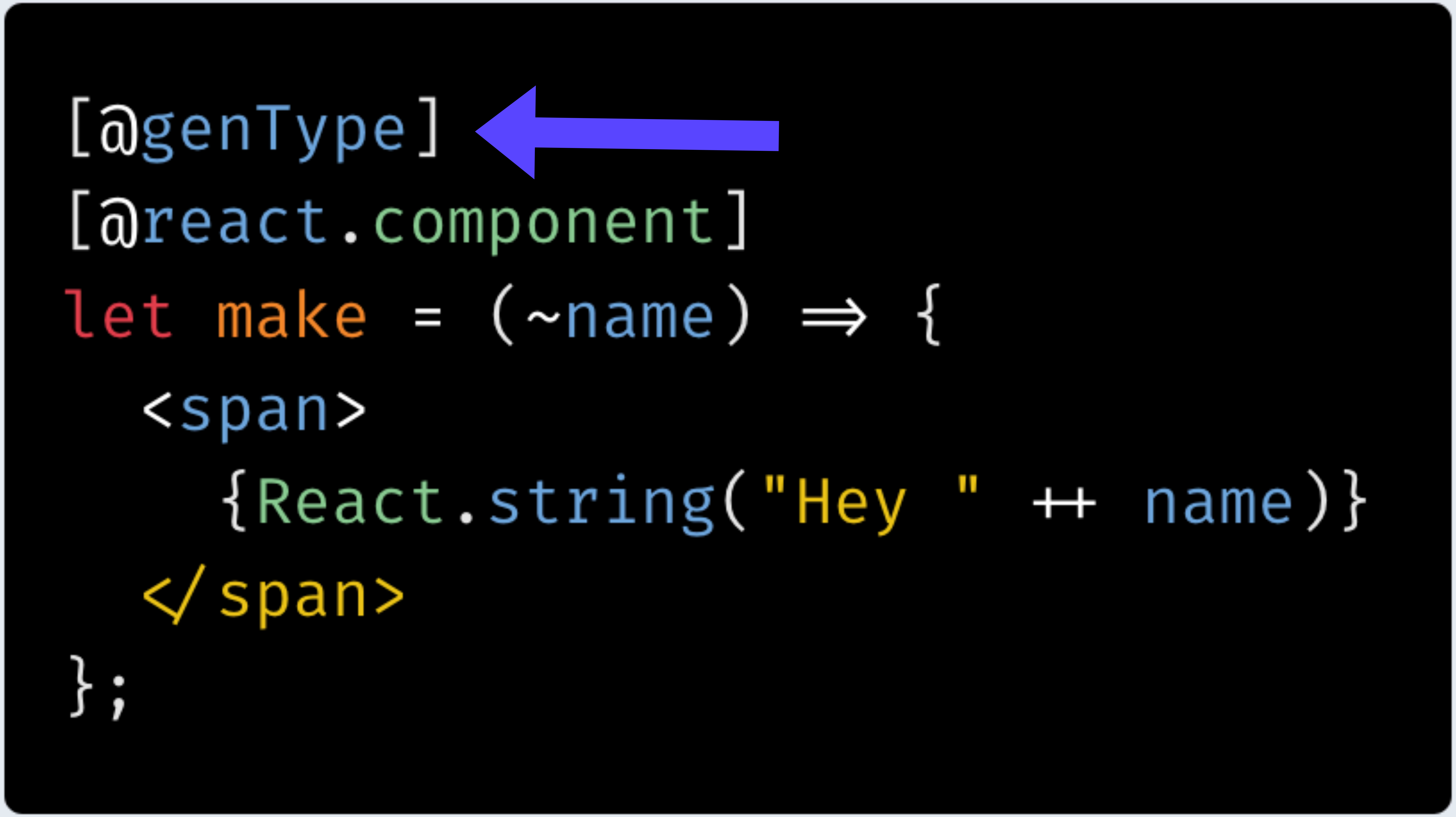
Variants offer a powerful way of representing complex data

Variants allow you to express this OR that

```
let message =
  switch (areYouCrushingIt) {
  | No => "No worries. Keep going!"
  | Yes => "Great!"
  | PrettyMuch => "Nice!"
  };

/* message is "Great!" */
```

Constructors can take arguments, too!

```
switch (response) {
  | Error(message) => "Oops: " ++ message
  | Loading => "Loading ..."
  | Success(name) => "Hello " ++ name ++ "!"
  };
```



```
[@genType]
[@react.component]
let make = (~name) => {
  <span>
    {React.string("Hey " ++ name)}
  </span>
};
```

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genType generates bindings between Reason & JavaScript

```
import Greeting from 'components/Greeting.gen'

function App() {
  return <Greeting name="GOTO" />
}
```

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genType supports Typescript & Flowtype

```
export type Props = {|
  +name: string
|};
```

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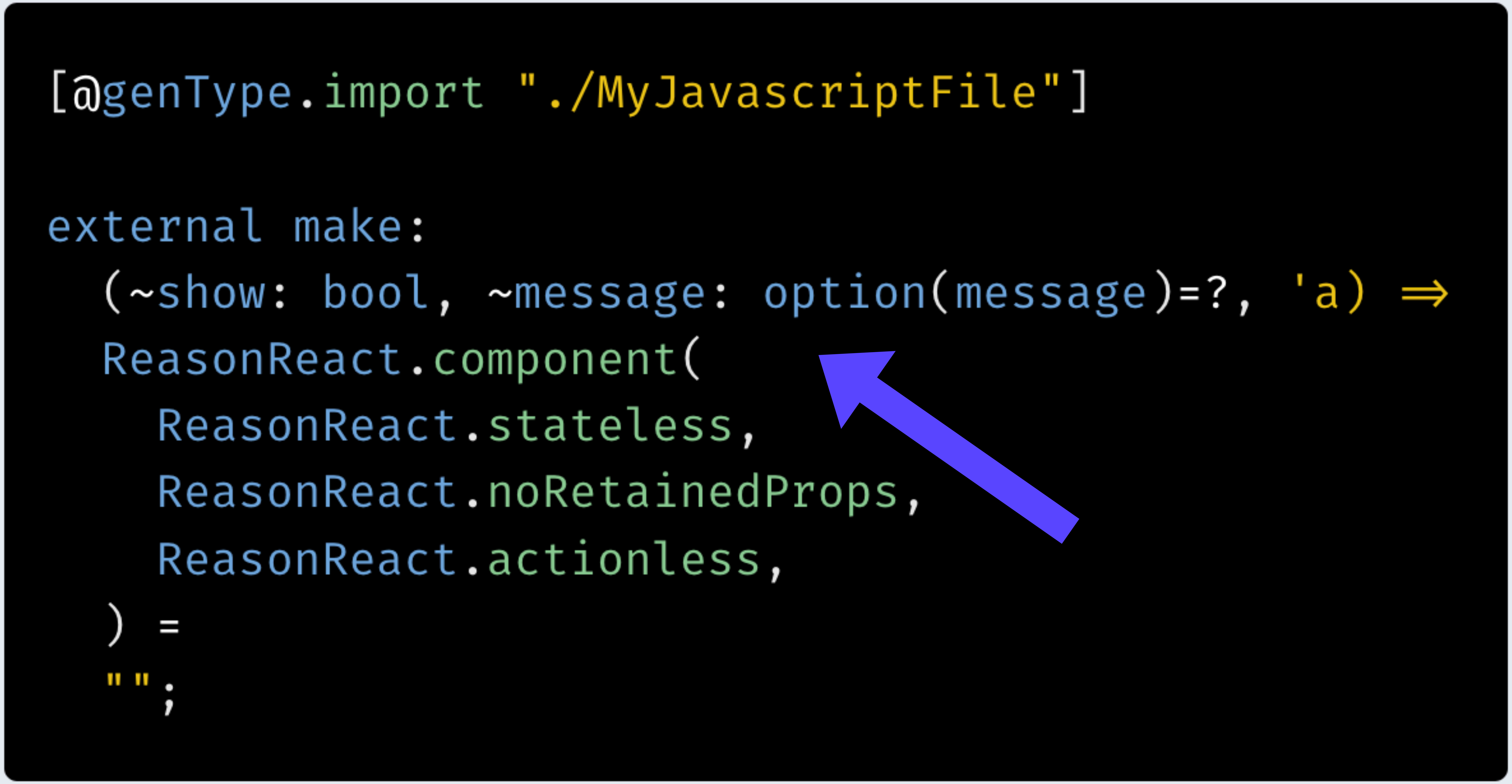
Can I use my existing Javascript components in Reason?



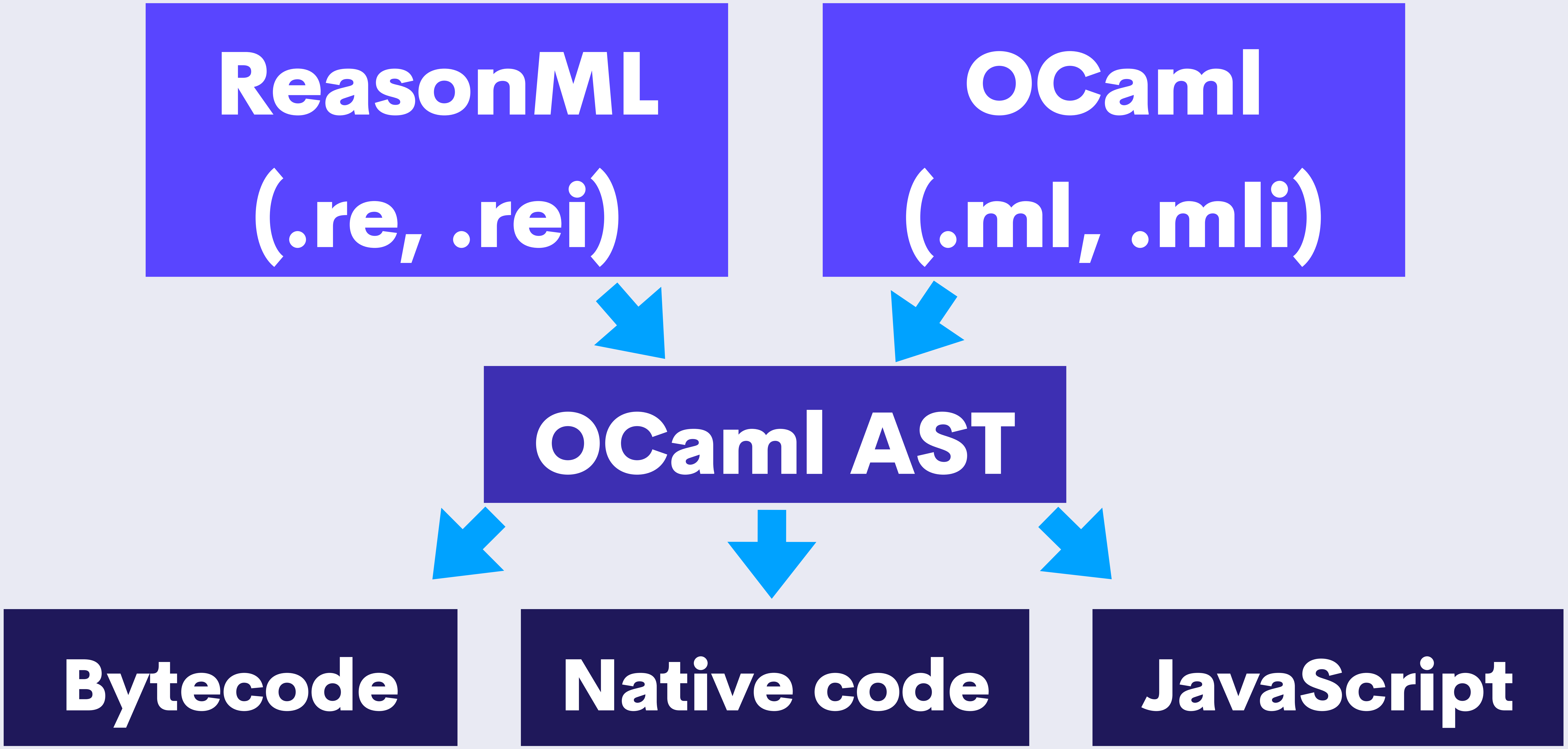
```
[@genType.import "./MyJavascriptFile"]

external make:
  (~show: bool, ~message: option(message)=?, 'a) ⇒
  ReasonReact.component(
    ReasonReact.stateless,
    ReasonReact.noRetainedProps,
    ReasonReact.actionless,
  ) =
  "";
```

That'll be automated soon, too ☺️

How do I add Reason to my Javascript project?

1. yarn add bs-platform —dev
2. add bsconfig.json
3. add script tags

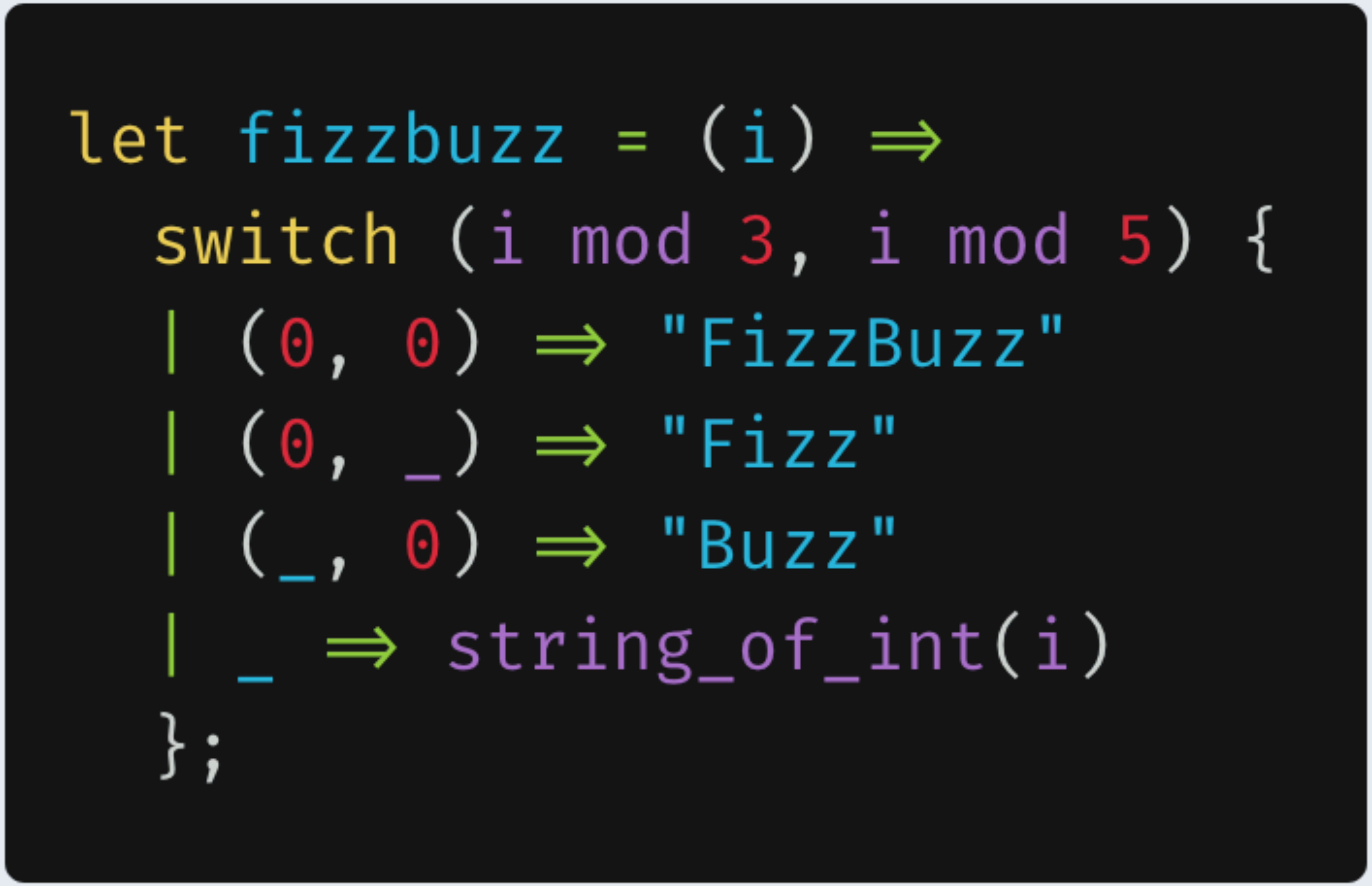
```
{
  "name": “my-project”,
  "reason": {"react-jsx" : 3},
  "bsc-flags": ["-bs-super-errors"],
  "package-specs": [{"module": “commonjs", "in-source": true}],
  "suffix": ".bs.js",
  "namespace": true,
  "bs-dependencies": ["reason-react"],
  "sources": [{"dir": "src"}],
  "refmt": 3
}
```


ReasonML (.re, .rei)
OCaml (.ml, .mli)
OCaml AST
Bytecode
Native code
JavaScript

BuckleScript

Write safer, simple, readable code that compiles to JavaScript

The compiled JavaScript is *readable*



```
let fizzbuzz = (i) =>
  switch (i mod 3, i mod 5) {
  | (0, 0) => "FizzBuzz"
  | (0, _) => "Fizz"
  | (_, 0) => "Buzz"
  | _ => string_of_int(i)
  };
```

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```
function fizzbuzz(i) {
  var match = i % 3;
  var match$1 = i % 5;
  if (match !== 0) {
    if (match$1 !== 0) {
      return String(i);
    } else {
      return "Buzz";
    }
  } else if (match$1 !== 0) {
    return "Fizz";
  } else {
    return "FizzBuzz";
  }
}
```

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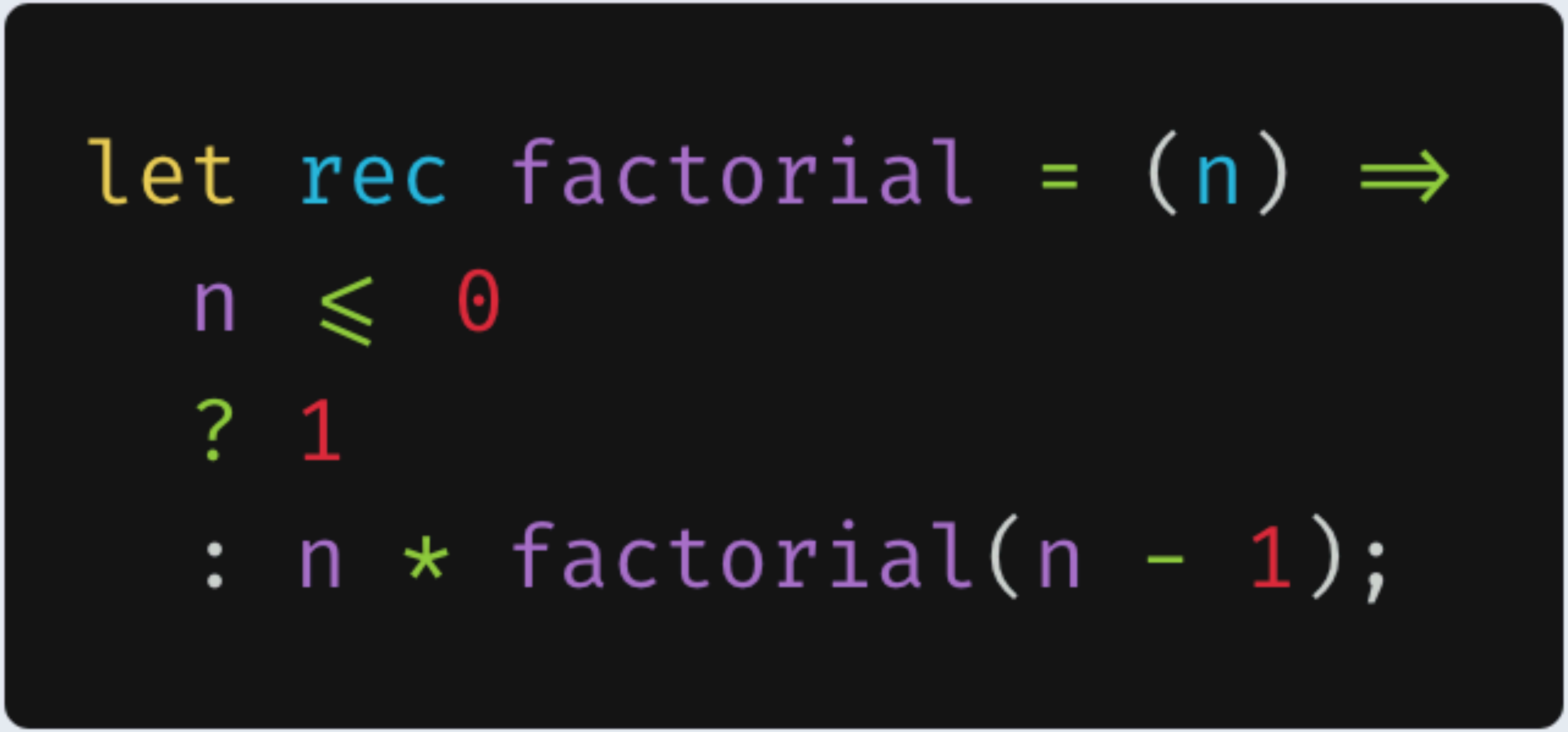

```
let rec factorial = (n) =>
  n <= 0
  ? 1
  : n * factorial(n - 1);
```

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```
var Caml_int32 = require("./stdlib/caml_int32.js");

function factorial(n) {
  var match = n <= 0;
  if (match) {
    return 1;
  } else {
    return Caml_int32.imul(n, factorial(n - 1 | 0));
  }
}
```

The compiled JavaScript is *faster*

ImmutableJS Map
3415ms

Reason Immutable Map

1186ms

Tree Shaking is 👌

Webpack
55,000 Bytes

Bucklescript
899 Bytes

Dr. Phil

BuckleScript has a deep integration with JS libs

Binding Javascript to Reason

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```
[@bs.val]
external add_keyboard_event_listener :
  (string, ReactEventRe.Keyboard.t => unit) => unit =
  "addEventListener";
```

*Getting this right is the hardest part

There are bindings for almost every library 😃

You get a taco!

Is Reason ready for production?

The answer is YES!

Companies Shipping Reason

Bloomberg

accenture

McKinsey & Company

Jane Street

draftbit

(& many more)

Where can I learn more?

Chicago ReasonML Meetup

draftbit

peterpme

ReasonML Discord

Google it

Reason Conf US 🎉

Chicago • October 2019

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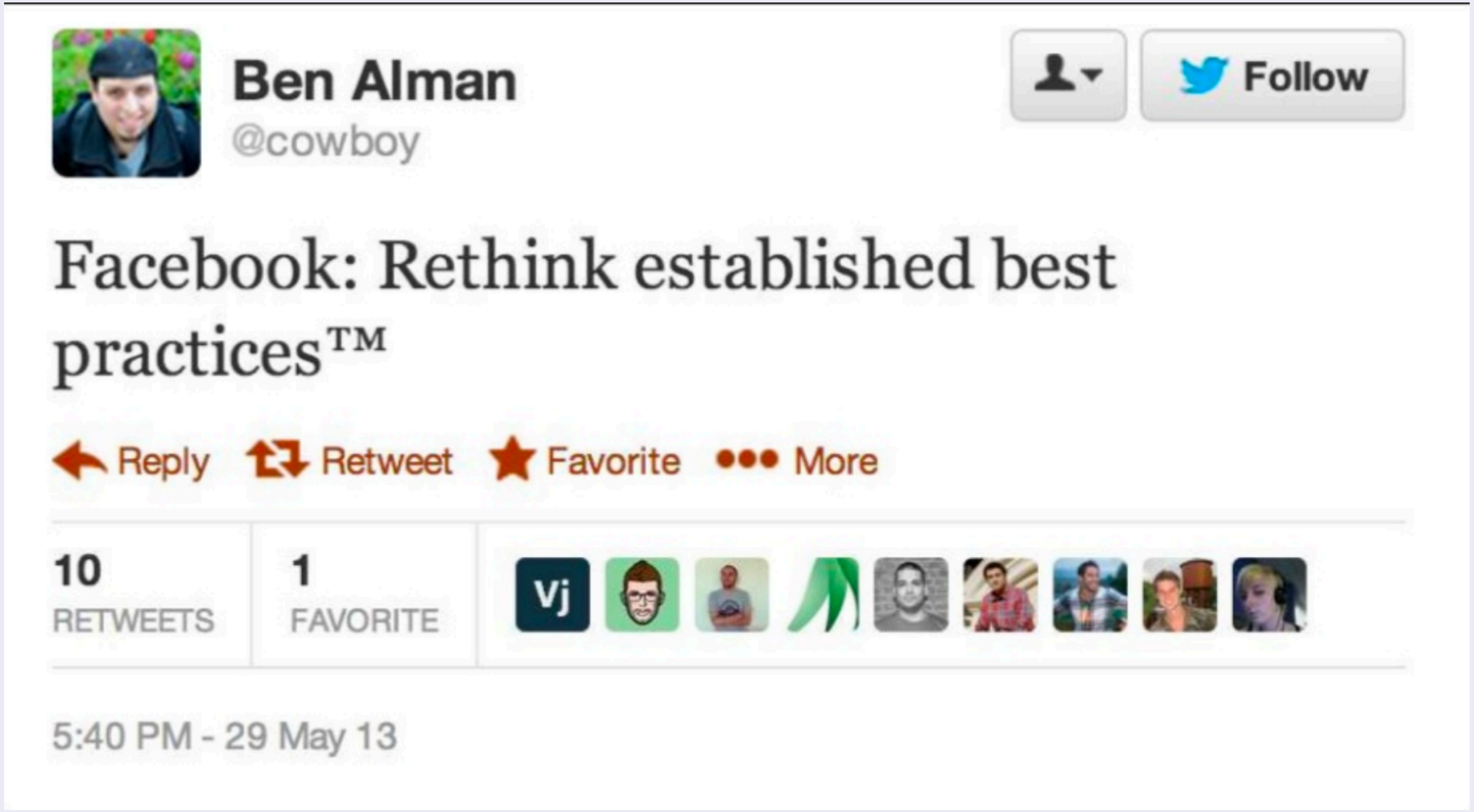
Keynote by Jordan Walke
Creator of React

www.reason-conf.us



Ben Alman
@cowboy

Facebook: Rethink established best practices™

10 RETWEETS
1 FAVORITE

5:40 PM - 29 May 13

Don’t be *that* person 😃

BAEs

BEST. AUDIENCE. EVER.

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goto; chicago

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