REASON

DON’T PANIC

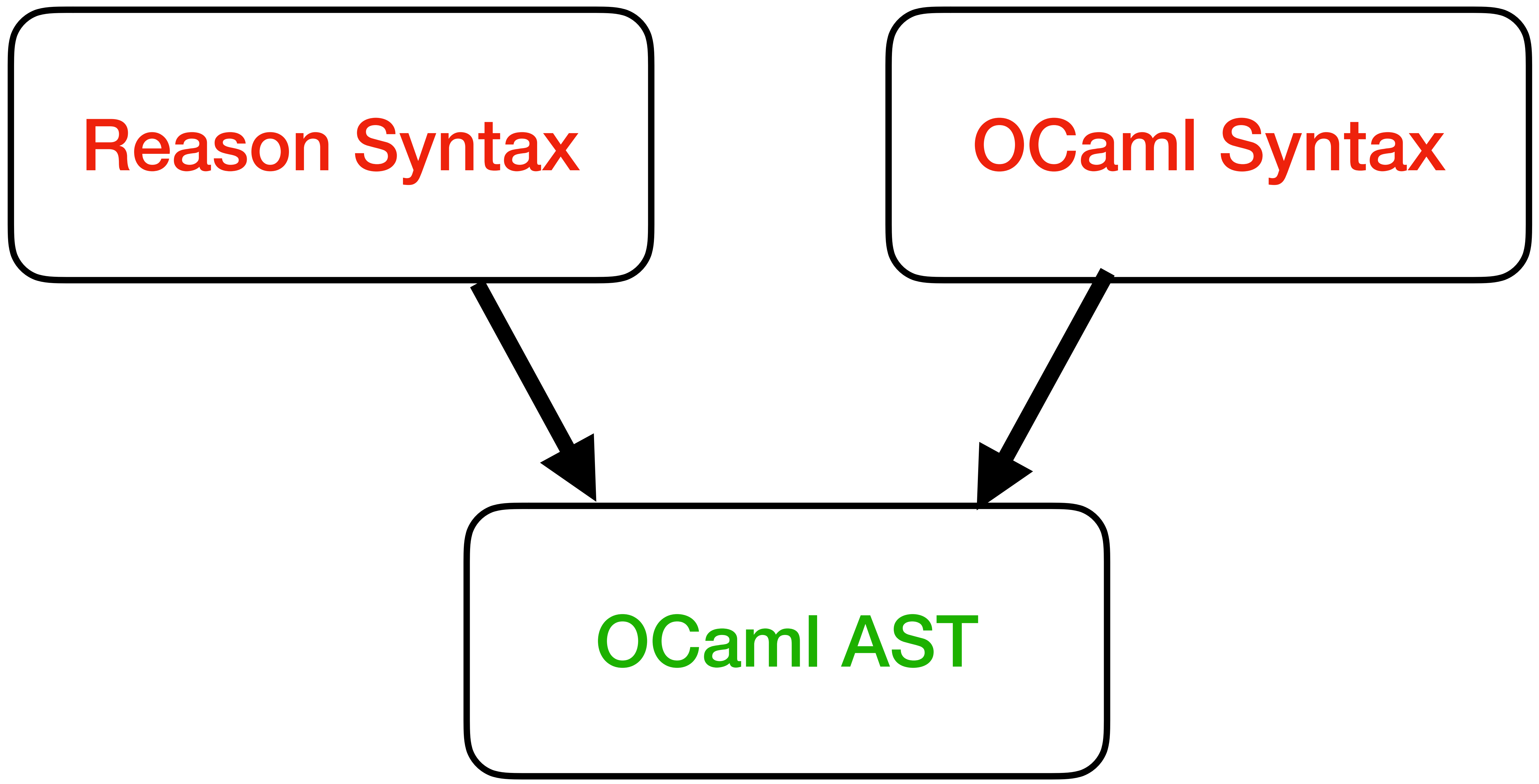
JavaScript developer friendly syntax

```
let meaningOfLife = 41 + 1;
let add = (x, y) => x + y;

add(2, 2);

add(41, 1);
```

```
let fruits = ["Apple", "Orange"];
```

```
if (true) {
  print_string("Hello World!");
};
```

OCaml semantics


Reason Syntax
OCaml Syntax
OCaml AST

Records

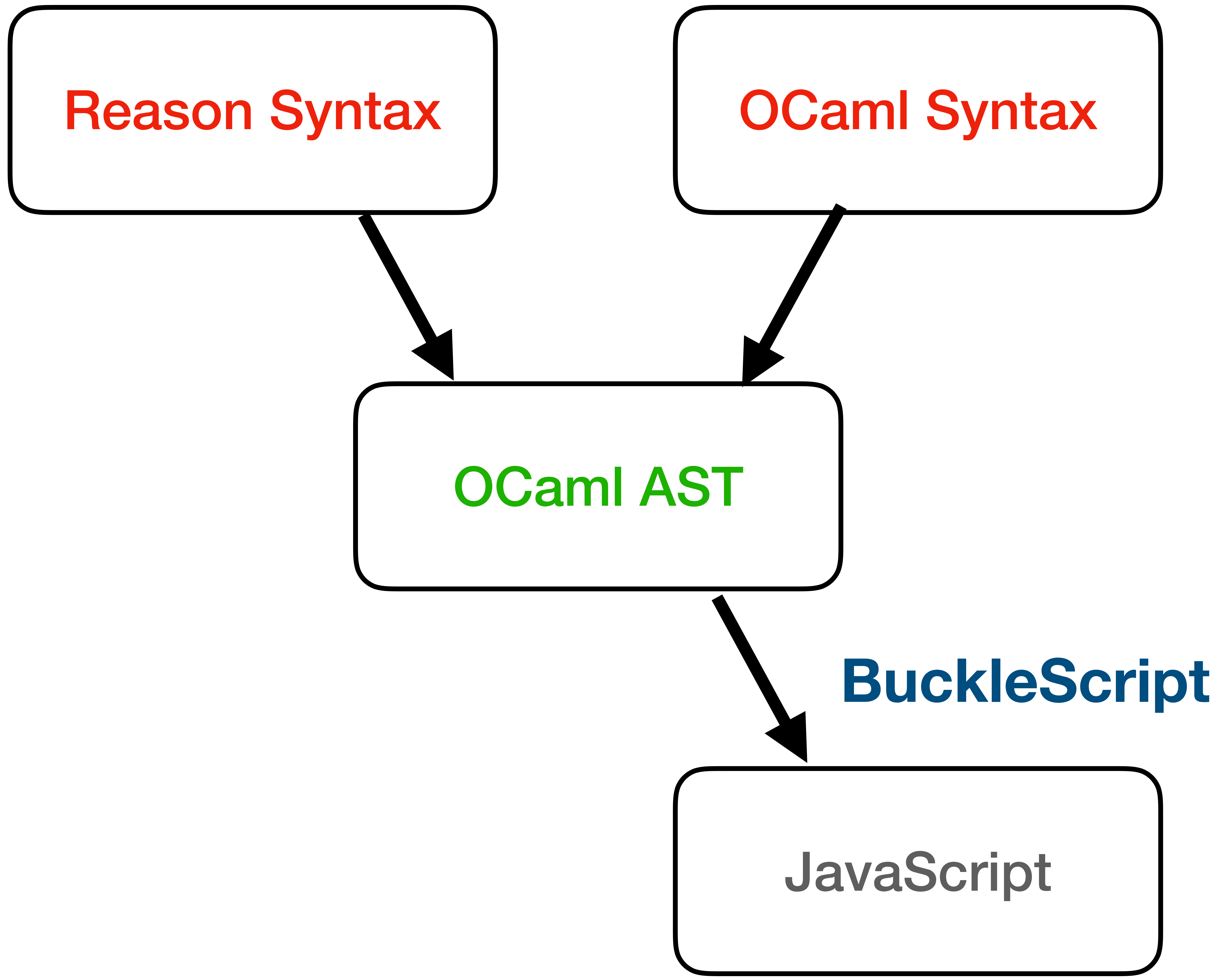
```
let jane = {name: "Jane", age: 40};
let jane = {name: "Jane", age: 40};
```

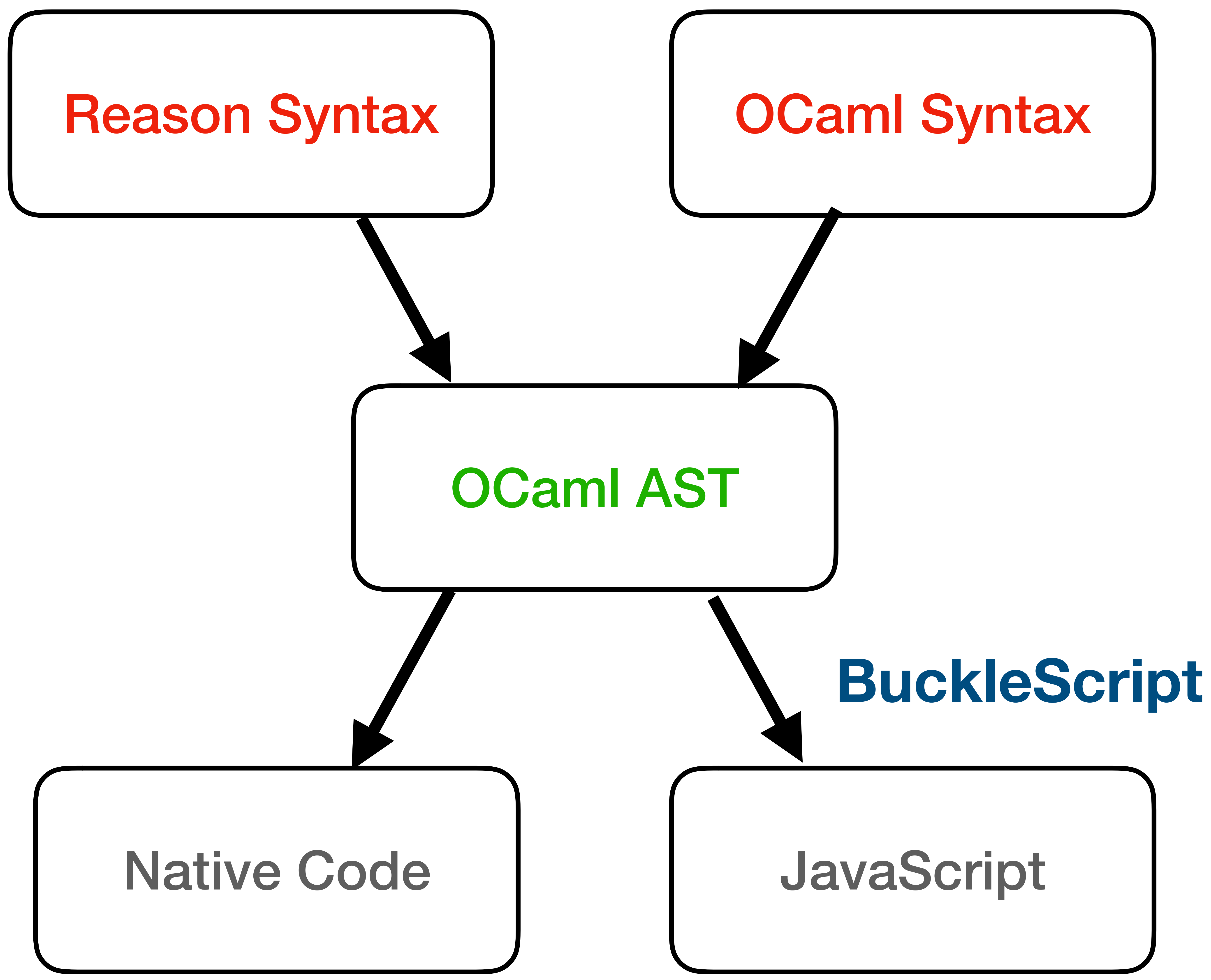
```
1 | let jane = {name: "Jane", age: 40};

The record field name can't be found.
```

```
type person = {
  name: string,
  age: int,
};

let jane = {name: "Jane", age: 40};
```

```
type person = {
  name: string,
  age: int,
};

let jane = {name: "Jane", age: 40};

let tim = {...jane, name: "Tim"};
```

Compiles to JavaScript


Reason Syntax
OCaml Syntax
OCaml AST
BuckleScript
JavaScript


Reason Syntax
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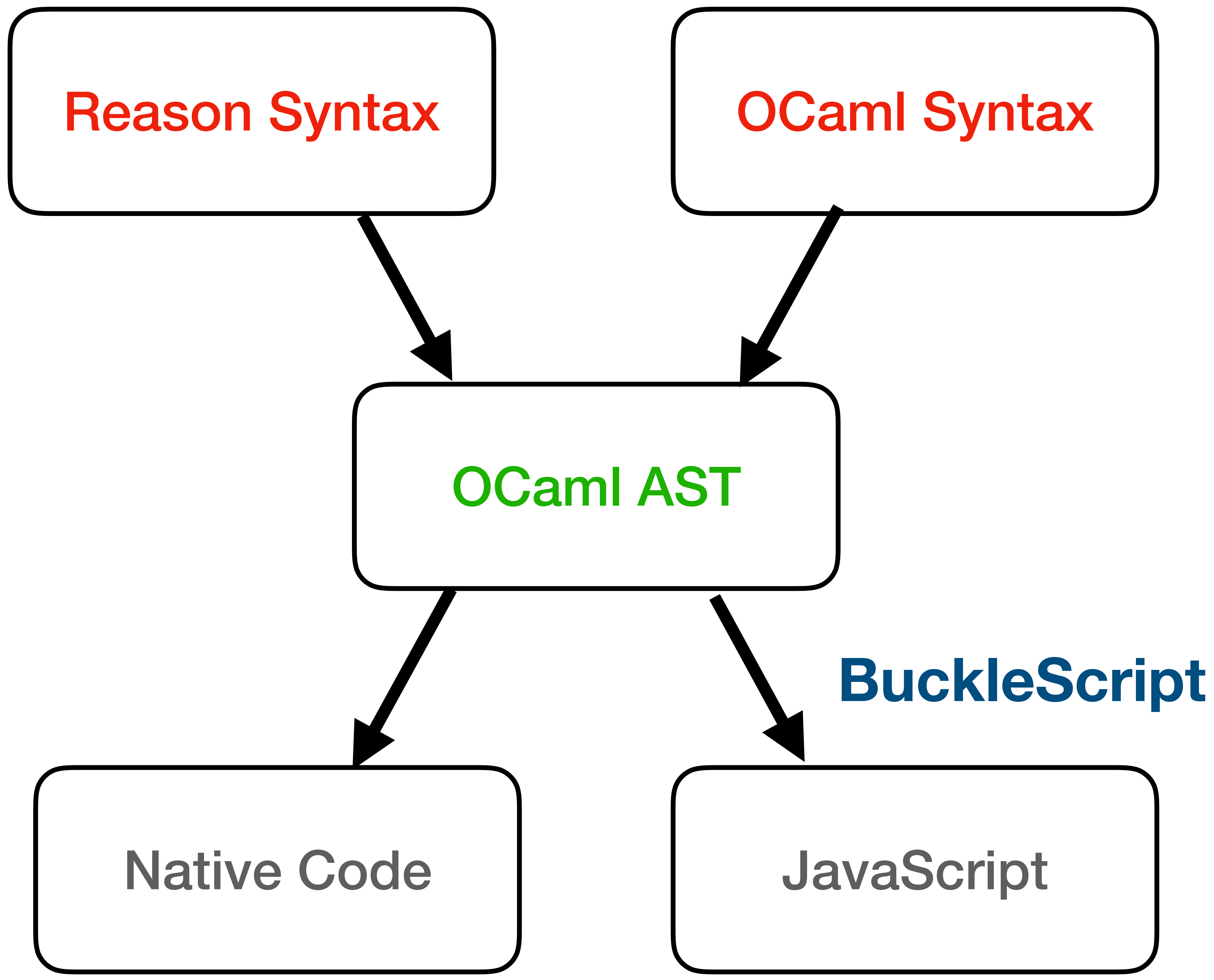
BuckleScript
Native Code
JavaScript

Fromatter


Reason Syntax
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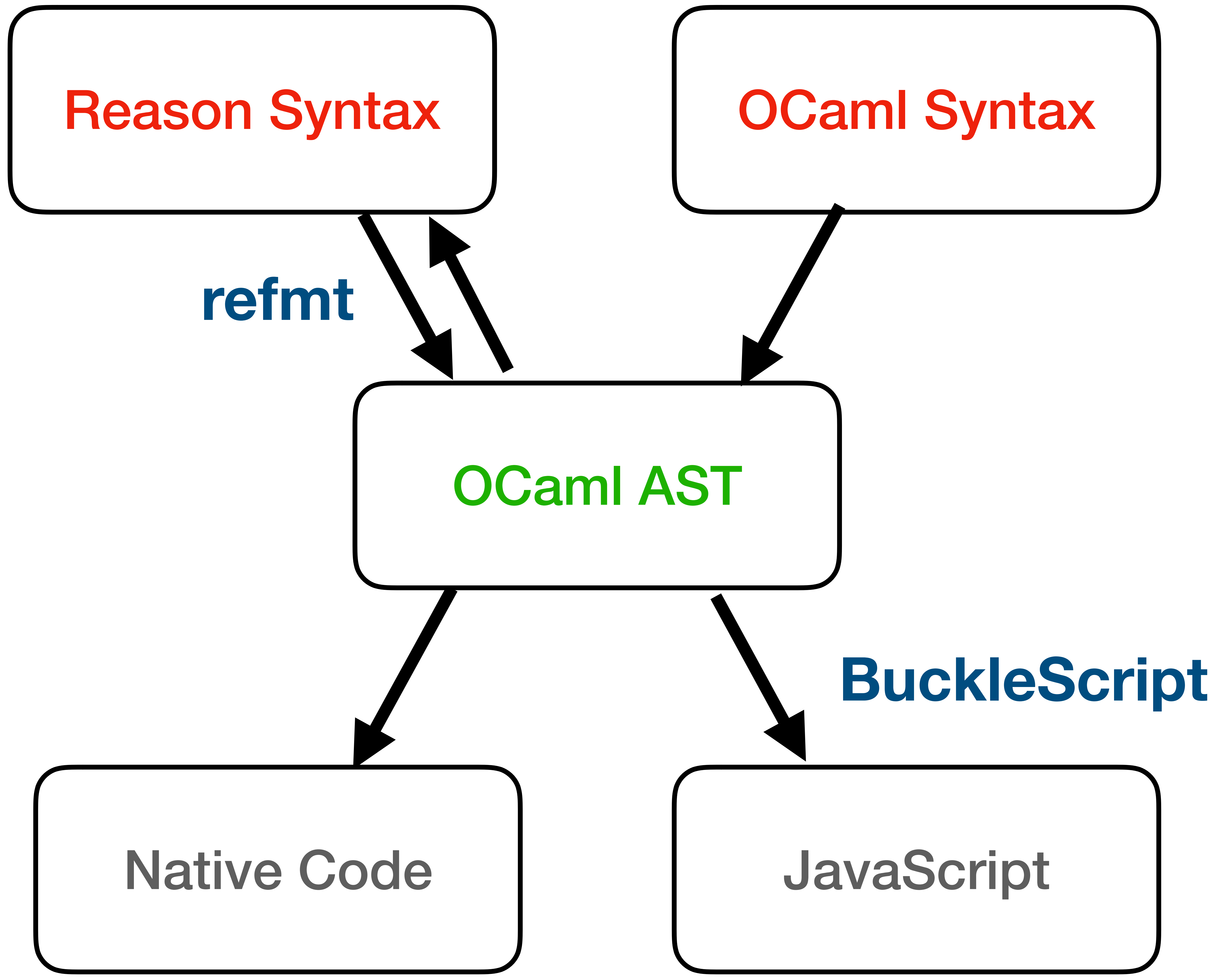

Reason Syntax
OCaml Syntax
refmt
OCaml AST
BuckleScript
Native Code
JavaScript

Statically Typed Language

Why yet another one?

JavaScript

```javascript
const pieces = [
  { kind: "king", color: "black", position: [3, 4] },
  { kind: "pawn", color: "black", position: [4, 2] },
  { kind: "knight", color: "white", position: [3, 3] }
];
```

TypeScript

```typescript
interface Piece {
  kind: string;
  color: string;
  position: number[];
}

const pieces = [
  { kind: "king", color: "black", position: [3, 4] },
  { kind: "pawn", color: "black", position: [4, 2] },
  { kind: "knight", color: "white", position: [3, 3] }
];

const getKinds = (pieces: Piece[]) => pieces.map(piece => piece.kind);
```

TypeScript

```typescript
interface Piece {
  kind: string;
  color: string;
  position: number[];
}

const pieces = [
  { kind: "king", color: "black", position: [3, 4] },
  { kind: "pawn", color: "black", position: [4, 2] },
  { kind: "knight", color: "white", position: [3, 3] }
];

const getKinds = (pieces: Piece[]) => pieces.map(piece => piece.kind);
```

Reason

```
type piece = {
  kind: string,
  color: string,
  position: (int, int),
};

let pieces = [
  {kind: "king", color: "black", position: (3, 4)},
  {kind: "pawn", color: "black", position: (4, 2)},
  {kind: "knight", color: "white", position: (3, 3)},
];

let getKinds = pieces => List.map(item => item.kind, pieces);
```

Variants

```
type direction =
   | Up
   | Down
   | Left
   | Right;
```

```
type direction =
  | Up
  | Down
  | Left
  | Right;

let move = Left;
```

```
type direction =
  | Up(int)
  | Down(int)
  | Left(int)
  | Right(int);

let move = Left(2);
```

```
type data = {names: list(string)};

type request =
  | Loading
  | Error(int)
  | Success(data);
```

```
type color = Black | White;

type kind = Queen | King | Rook | Bishop | Knight | Pawn;

type piece = {
  color,
  kind,
  position: (int, int),
};

let pieces = [
  {kind: King, color: Black, position: (3, 4)},
  {kind: Pawn, color: Black, position: (4, 2)},
  {kind: Knight, color: White, position: (3, 3)},
];
```

```
type color = Black | White;

type kind = Queen | King | Rook | Bishop | Knight | Pawn;

type piece = {
  color,
  kind,
  position: (int, int),
};

let pieces = [
  {kind: King, color: Black, position: (3, 4)},
  {kind: Pawn, color: Black, position: (4, 2)},
  {kind: Knight, color: White, position: (3, 3)},
];
```

```
type color = Black | White;

type kind = Queen | King | Rook | Bishop | Knight | Pawn;

type piece = {
  color,
  kind,
  position: (int, int),
};

let pieces = [
  {kind: King, color: Black, position: (3, 4)},
  {kind: Pawn, color: Black, position: (4, 2)},
  {kind: Knight, color: White, position: (3, 3)},
];
```

Pattern Matching

```
switch (<value>) {
| <pattern1> => <case1>
| <pattern2> => <case2>
| ...
};
```

```
switch (1) {
| 0 => "off"
| 1 => "on"
| _ => "off"
};
```

```
let displayText =
  switch (1) {
  | 0 => "off"
  | 1 => "on"
  | _ => "off"
  };
```

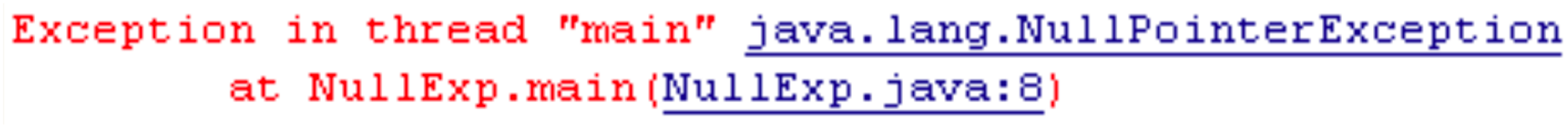
```
type data = {names: list(string)};

type request =
  | Loading
  | Error(int)
  | Success(data);

let ui =
  switch (Loading) {
  | Loading => "Loading ..."
  | Error(code) => "Something went wrong. Error: " ++ string_of_int(code)
  | Success(data) => List.fold_left((a, b) => a ++ b, "Names:", data.names)
  };
```

```
type data = {names: list(string)};

type request =
  | Loading
  | Error(int)
  | Success(data);

let ui =
  switch (Loadi[illegible] {
  | Loading => [illegible]ing ..."
  | Error(401) => "You aren’t authenticated."
  | Error(code) => "Something went wrong. Error: " ++ string_of_int(code)
  | Success(data) => List.fold_left((a, b) => a ++ b, "Names:", data.names)
  };
```

```
type data = {names: list(string)};

type request =
  | Loading
  | Error(int)
  | Success(data);

let ui =
  switch (Loadi     {
  | Loading =>      ling ..."
  | Error(401 | 402) => "You aren’t authenticated."
  | Error(code) => "Something went wrong. Error: " ++ string_of_int(code)
  | Success(data) => List.fold_left((a, b) => a ++ b, "Names:", data.names)
  };
```

“I call it my billion-dollar mistake …”

– Tony Hoare



```
Exception in thread "main" java.lang.NullPointerException
        at NullExp.main(NullExp.java:8)
```

```
Uncaught TypeError: Cannot read property 'undefined' of undefined
    at <anonymous>:3:11
```

Lesson I

Don’t implement anything just because it’s easy!

Lesson II

Null is BAD!

```
null; // doesn't exist!
```

Option

```rust
let foo = None;

let foo = Some(42);

let foo = Some([1, 2, 3]);

let foo = Some("Hello World!");
let foo = None;

let foo = Some(42);

let foo = Some([1, 2, 3]);

let foo = Some("Hello World!");

switch (foo) {
| None => "Sadly I don't know."
| Some(value) => "It's " ++ value
};
```

Functions

```
let add = (x, y) => x + y;

add(2, 2);
add(41, 1);
```

```
let name = (~firstName, ~lastName) => firstName ++ " " ++ lastName;

/* Jane Doe */
name(~firstName="Jane", ~lastName="Doe");

/* Jane Doe */
name(~lastName="Doe", ~firstName="Jane");
```

ReasonReact

Stateless Component

Greeting.re

```
let component = ReasonReact.statelessComponent("Greeting");

let make = (_children) => {
  ...component,
  render: _self => <h1>(ReasonReact.string("Hello"))</h1>,
};
```

App.re

```
ReactDOMRe.renderToElementWithId(<Greeting />, "root");
```

Props

Greeting.re

```
let component = ReasonReact.statelessComponent("Greeting");

let make = (~name, _children) => {
  ...component,
  render: _self => <h1>(ReasonReact.string(“Hello " ++ name))</h1>,
};
```

App.re

```
ReactDOMRe.renderToElementWithId(<Greeting name="Helsinki" />, "root");
```

Props

Greeting.re

```
let component [illegible]asonReact.statelessComponent("Greeting");

let make = (~name, _children) => {
  ...component,
  render: _self => <h1>(ReasonReact.string("Hello " ++ name))</h1>,
};
```

App.re

```
ReactDOMRe.renderToElementWithId(<Greeting name="Helsinki" />, "root");
```

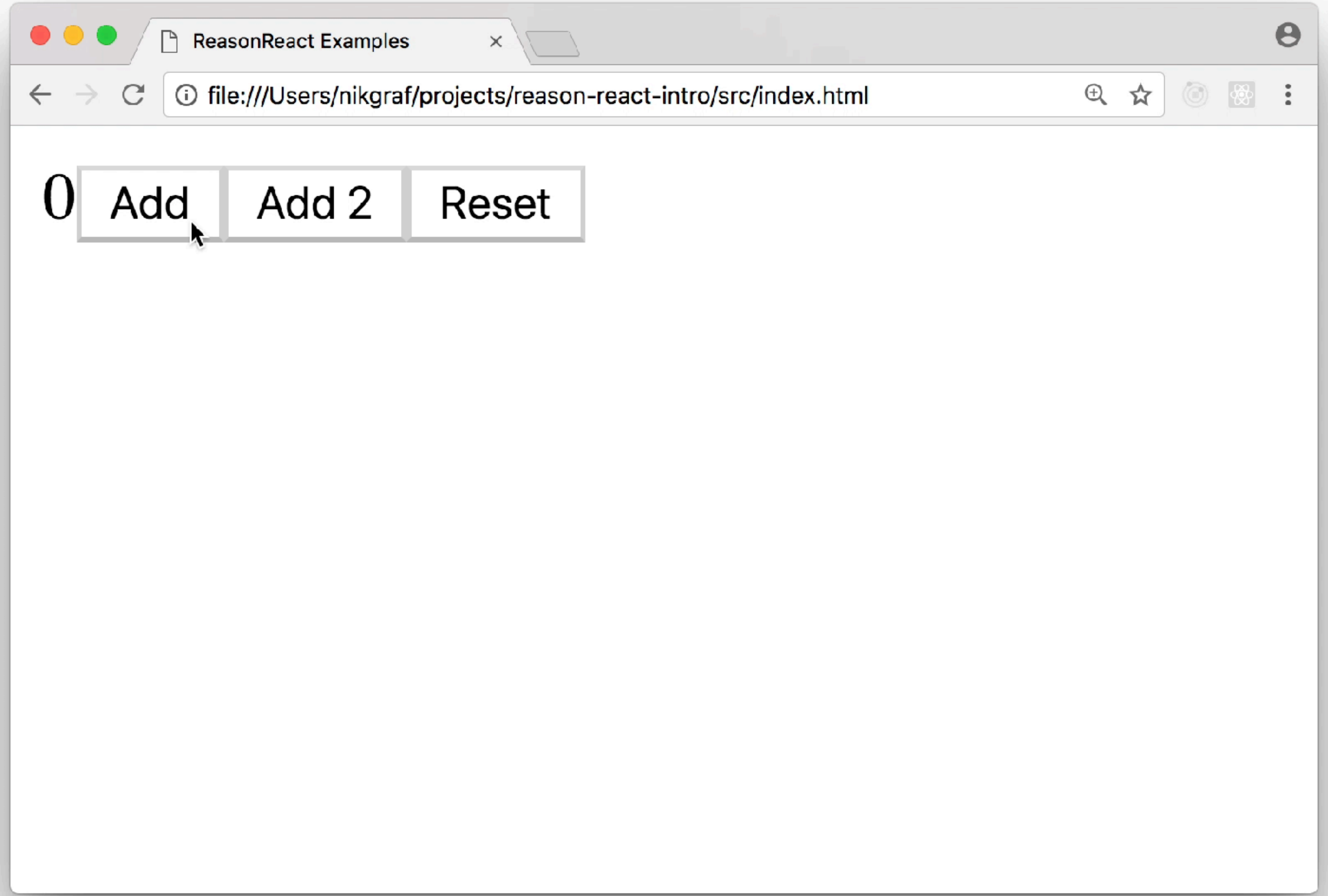
Props

Greeting.re

```
let component = ReasonReact.statelessComponent("Greeting");

let make = (~name, _children) => {
  ...component,
  render: _self => <h1>(ReasonReact.string("Hello " ++ name))</h1>,
};
```

App.re

```
ReactDOMRe.renderToElementWithId(<Greeting name="Helsinki" />, "root");
```


ReasonReact Examples
file:///Users/nikgraf/projects/reason-react-intro/src/index.html
0
Add
Add 2
Reset

```
type state = {count: int};
type state = {count: int};

type action =
  | Add(int)
  | Reset;
```

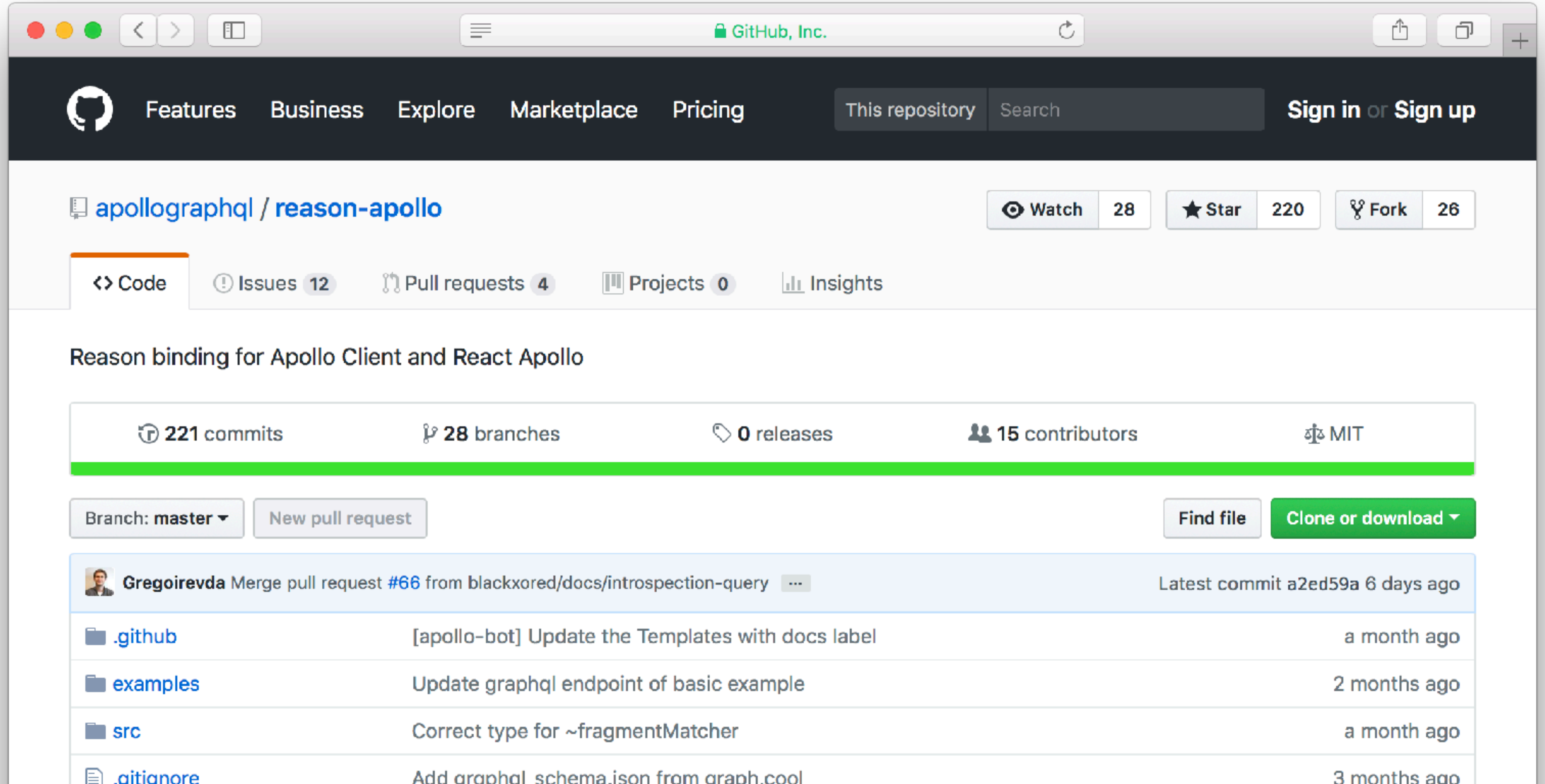
```
type state = {count: int};

type action =
  | Add(int)
  | Reset;

let s = ReasonReact.string;
```

```
type state = {count: int};

type action =
  | Add(int)
  | Reset;

let s = ReasonReact.string;

let component = ReasonReact.reducerComponent("Counter");
```

```
type state = {count: int};

type action =
  | Add(int)
  | Reset;

let s = ReasonReact.string;

let component = ReasonReact.reducerComponent("Counter");

let make = _children => {
  ...component,
  initialState: () => {count: 0},
type state = {count: int};

type action =
  | Add(int)
  | Reset;

let s = ReasonReact.string;

let component = ReasonReact.reducerComponent("Counter");

let make = _children => {
  ...component,
  initialState: () => {count: 0},
  reducer: (action, state) =>
    switch (action) {
    | Add(value) => ReasonReact.Update({count: state.count + value})
    | Reset => ReasonReact.Update({count: 0})
    },
type state = {count: int};

type action =
  | Add(int)
  | Reset;

let s = ReasonReact.string;

let component = ReasonReact.reducerComponent("Counter");

let make = _children => {
  ...component,
  initialState: () => {count: 0},
  reducer: (action, state) =>
    switch (action) {
    | Add(value) => ReasonReact.Update({count: state.count + value})
    | Reset => ReasonReact.Update({count: 0})
    },
  render: self =>
    <div>
      (s(string_of_int(self.state.count)))
      <button onClick={_event => self.send(Add(1))}> (s(“Add")) </button>
```

```
let s = ReasonReact.string;

let component = ReasonReact.reducerComponent("Counter");

let make = _children => {
  ...component,
  initialState: () => {count: 0},
  reducer: (action, state) =>
    switch (action) {
    | Add(value) => ReasonReact.Update({count: state.count + value})
    | Reset => ReasonReact.Update({count: 0})
    },
  render: self =>
    <div>
      (s(string_of_int(self.state.count)))
      <button onClick=(_event => self.send(Add(1)))> (s(“Add")) </button>
      <button onClick=(_event => self.send(Add(2)))> (s("Add 2")) </button>
      <button onClick=(_event => self.send(Reset))> (s("Reset")) </button>
    </div>,
};
```

Manage your State with GraphQL



apollographql / reason-apollo

Reason binding for Apollo Client and React Apollo

221 commits | 28 branches | 0 releases | 15 contributors | MIT

Gregoirevda Merge pull request #66 from blackxored/docs/introspection-query ... Latest commit a2ed59a 6 days ago

.github	[apollo-bot] Update the Templates with docs label	a month ago
examples	Update graphql endpoint of basic example	2 months ago
src	Correct type for ~fragmentMatcher	a month ago
.gitignore	Add graphql_schema.json from graph.cool	3 months ago

Interop with JavaScript

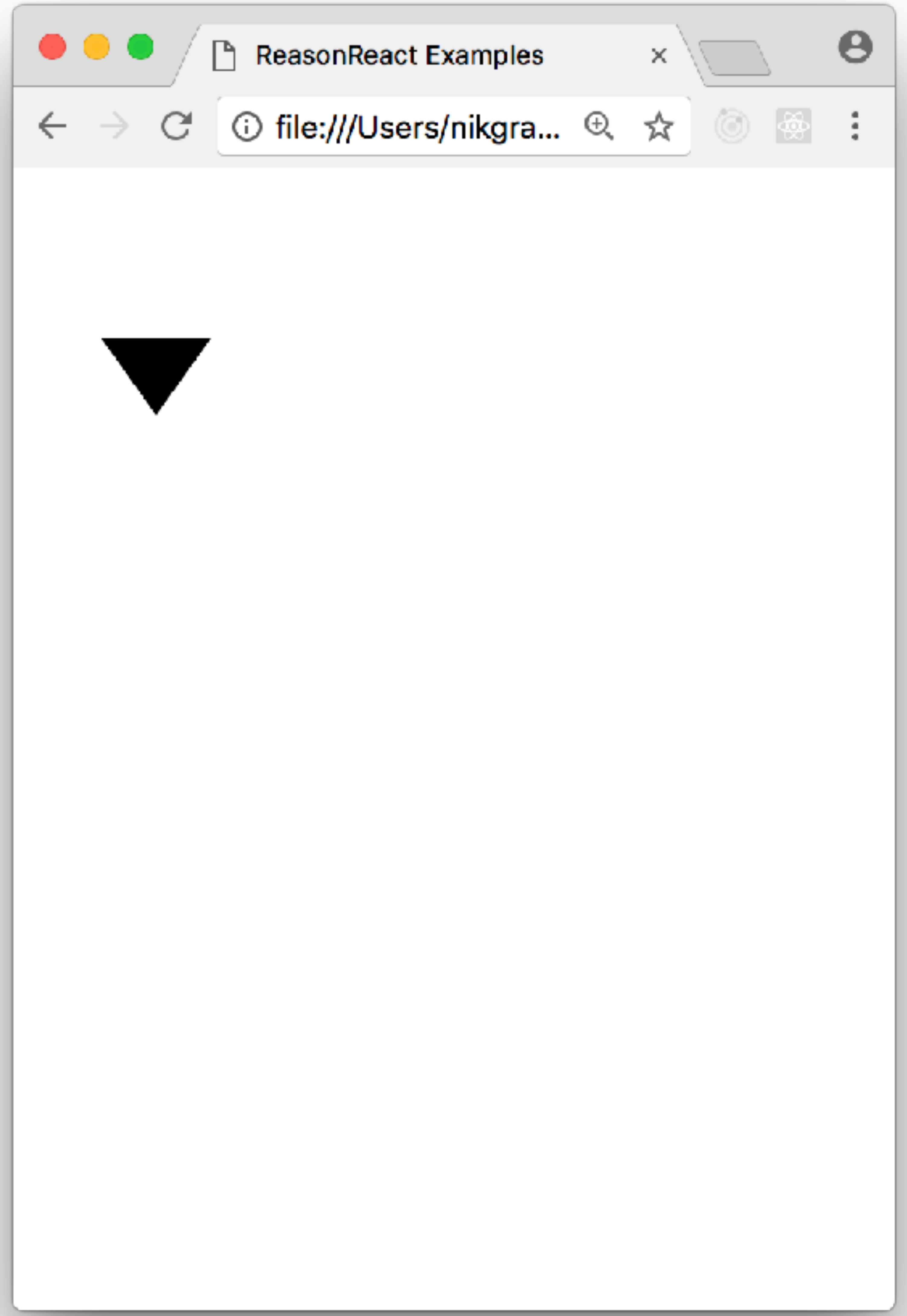
BuckleScript allows us to write bindings

ReasonReact

- wrapJsForReason
- wrapReasonForJs

```reason
[@bs.module "rebass"] external jsArrow : ReasonReact.reactClass = "Arrow";

let make = (~direction: string, children) =>
  ReasonReact.wrapJsForReason(
    ~reactClass=jsArrow,
    ~props={"direction": direction},
    children,
  );
```

```
<Arrow direction="down" />
```

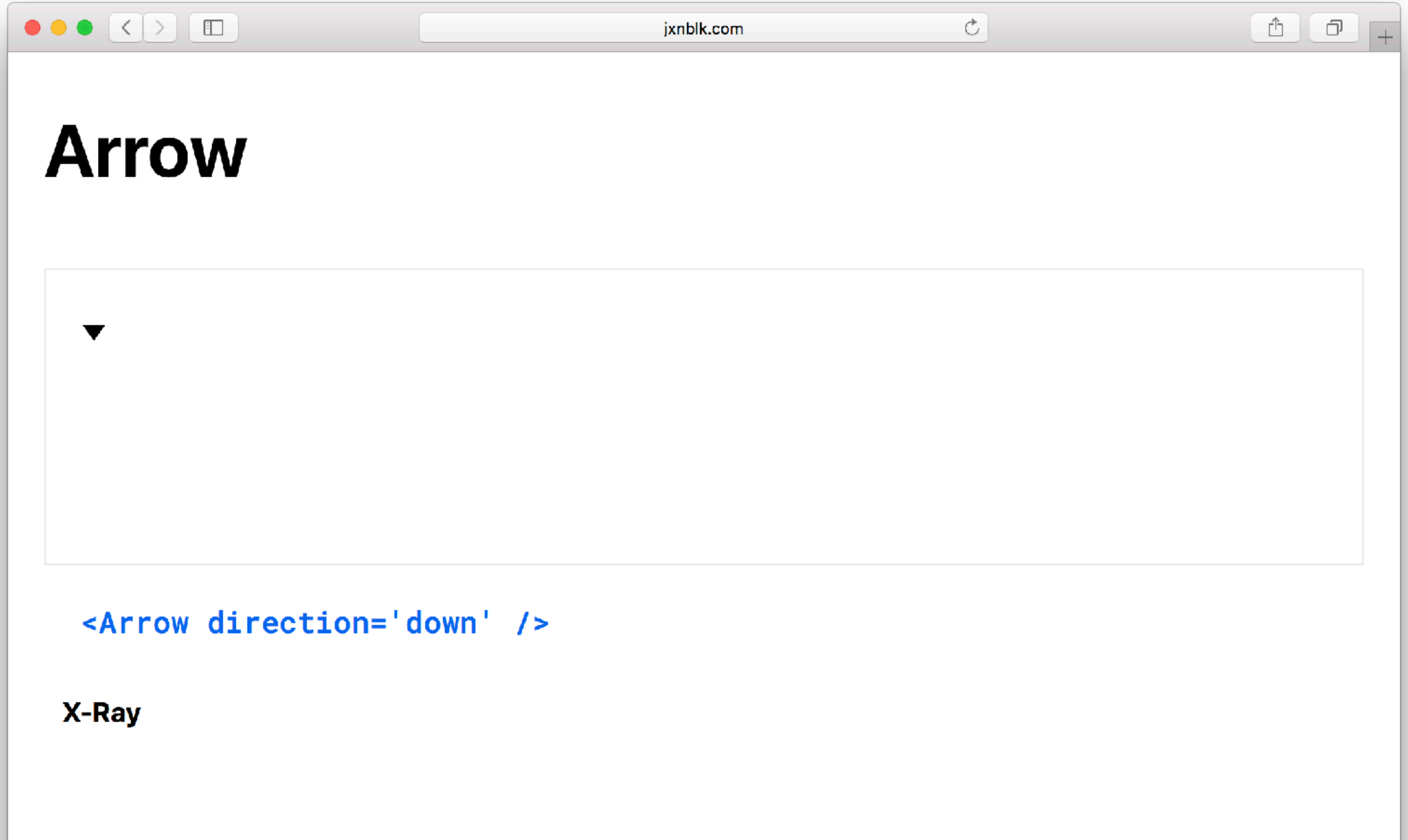

ReasonReact Examples
file:///Users/nikgra...

```
<Arrow direction="left" />
```

ReasonReact Examples
file:///Users/nikgra...

```
<Arrow direction="notRight"/>
```

ReasonReact Examples
file:///Users/nikgra...



Arrow

▼

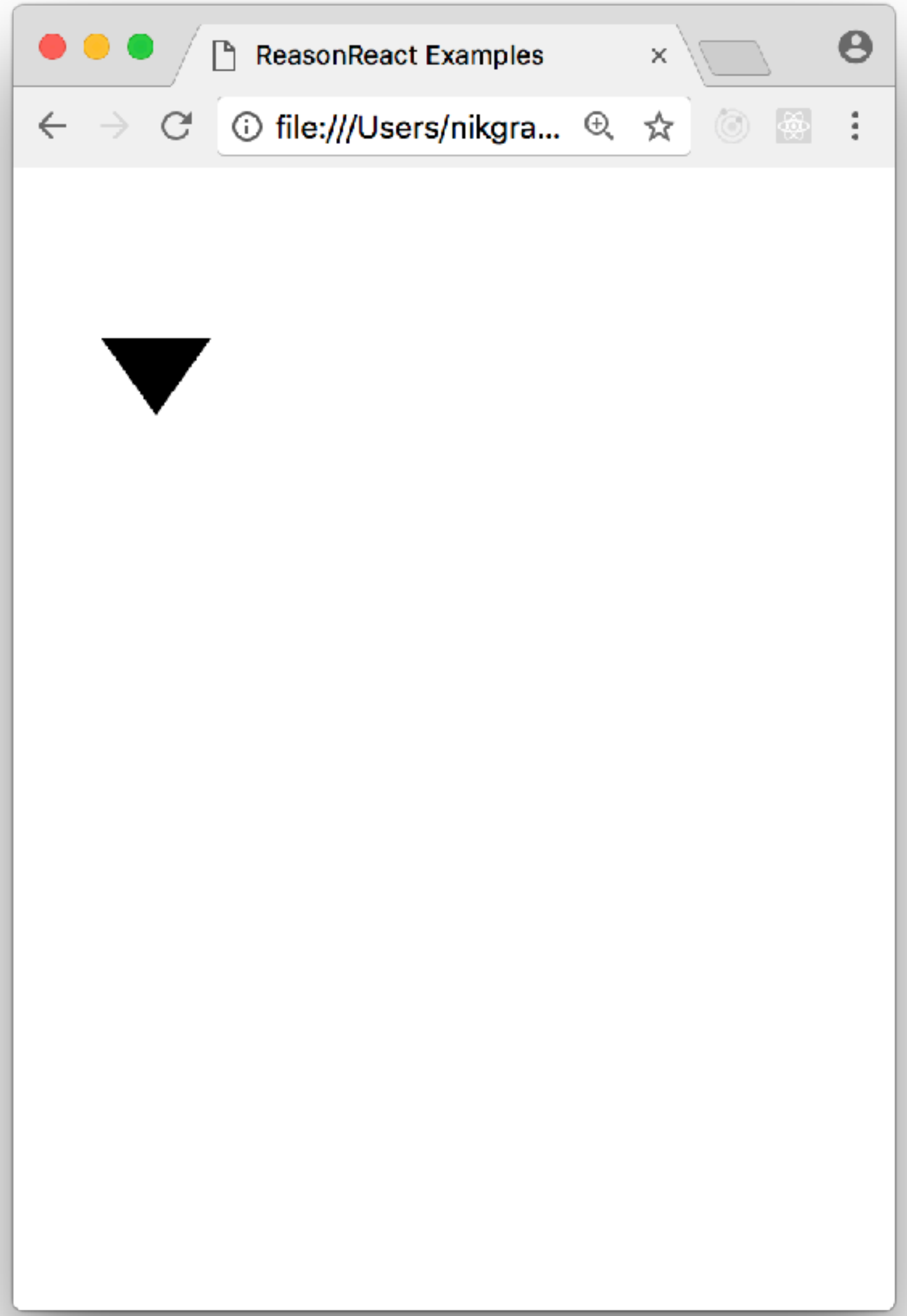
```
<Arrow direction='down' />
```

X-Ray

Variants to the rescue!

```
[@bs.module "rebass"] external jsArrow : ReasonReact.reactClass = "Arrow";

type direction =
  | Up
  | Down;

let make = (~direction, children) => {
  let directionString =
    switch (direction) {
    | Up => "up"
    | Down => "down"
    };
  ReasonReact.wrapJsForReason(
    ~reactClass=jsArrow,
    ~props={"direction": directionString},
    children,
  );
};
```

```
<Arrow direction=Arrow.Down />;
```


ReasonReact Examples
file:///Users/nikgra...

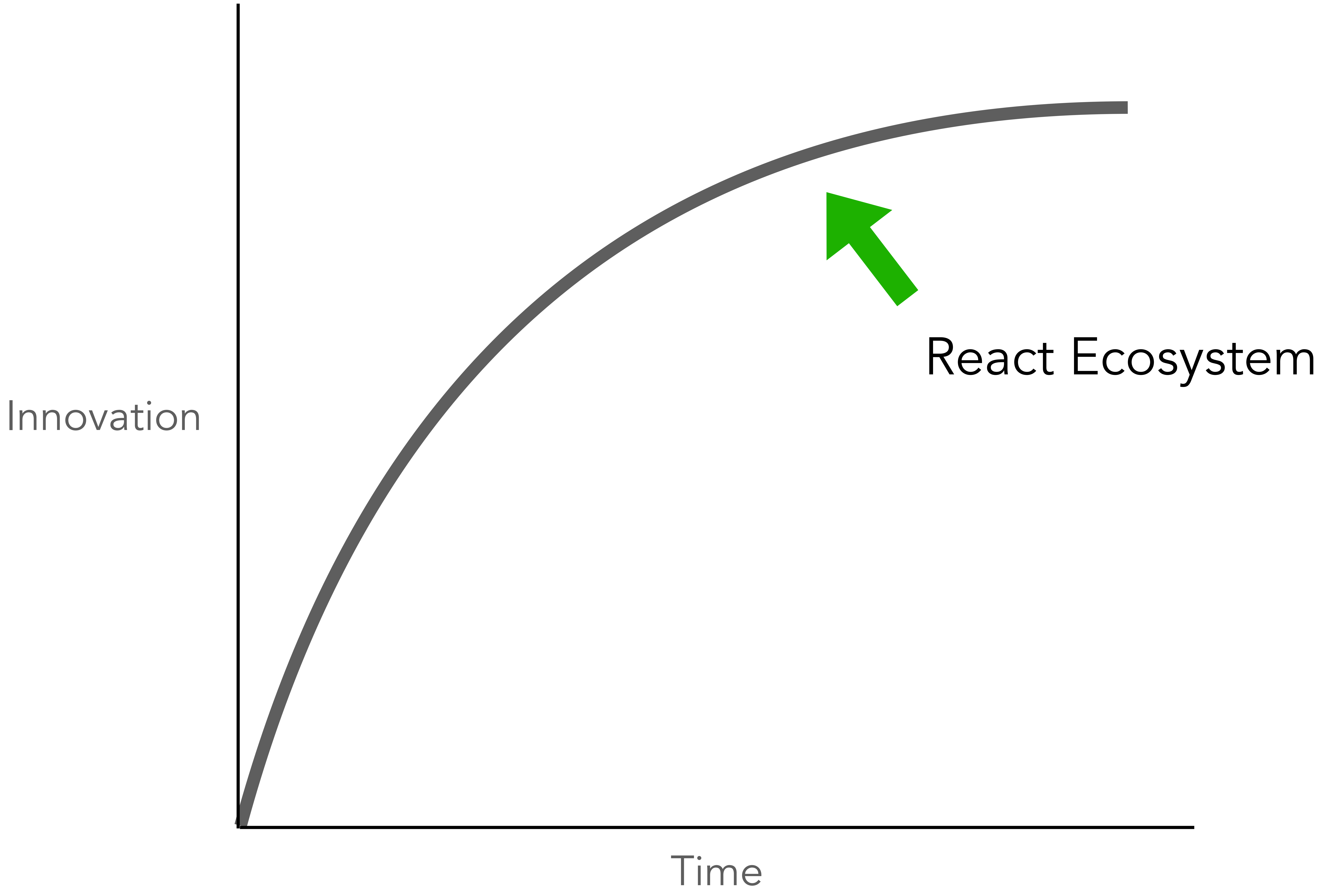
```
<Arrow direction=Arrow.Left />;
```

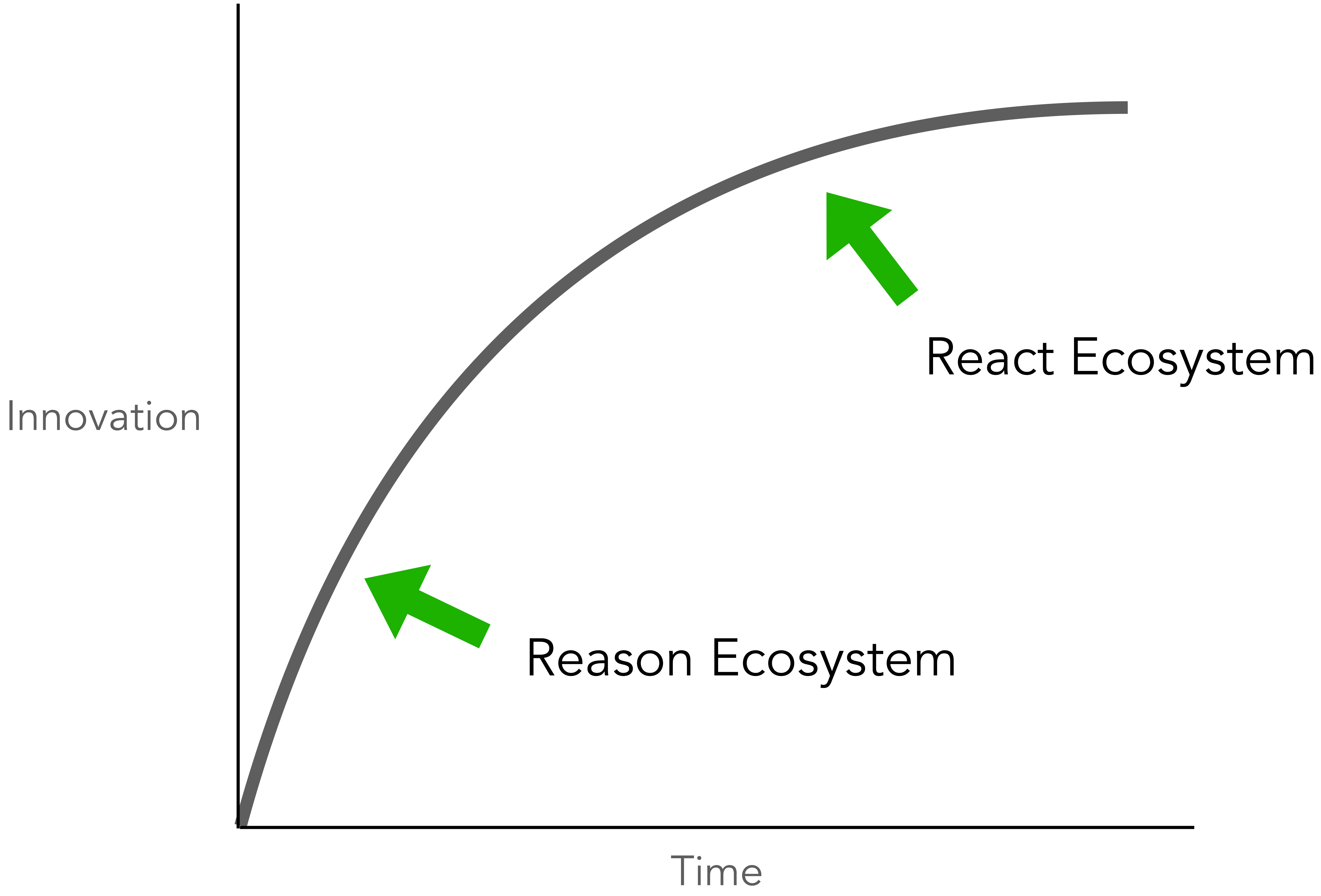
```
<Arrow direction=Arrow.Left />;
```

```
3 | let make = _children => {
4 |   ...component,
5 |   render: _self => <div> <Arrow direction=Arrow.Left /> </div>,
6 | };

The variant constructor Arrow.Left can't be found.
```

So what now?

Don’t be that person


React Ecosystem
Innovation
Time


Innovation
React Ecosystem
Reason Ecosystem
Time

REASONCONF

11–13 May 2018

World’s first Reason conference for web-developers & OCaml enthusiasts

Vienna, Austria

Day 1: Workshop

Day 2: Talks

Day 3: Hackathon

The End