

Elm



About me



Most Popular Technologies per Dev Type

Full-Stack

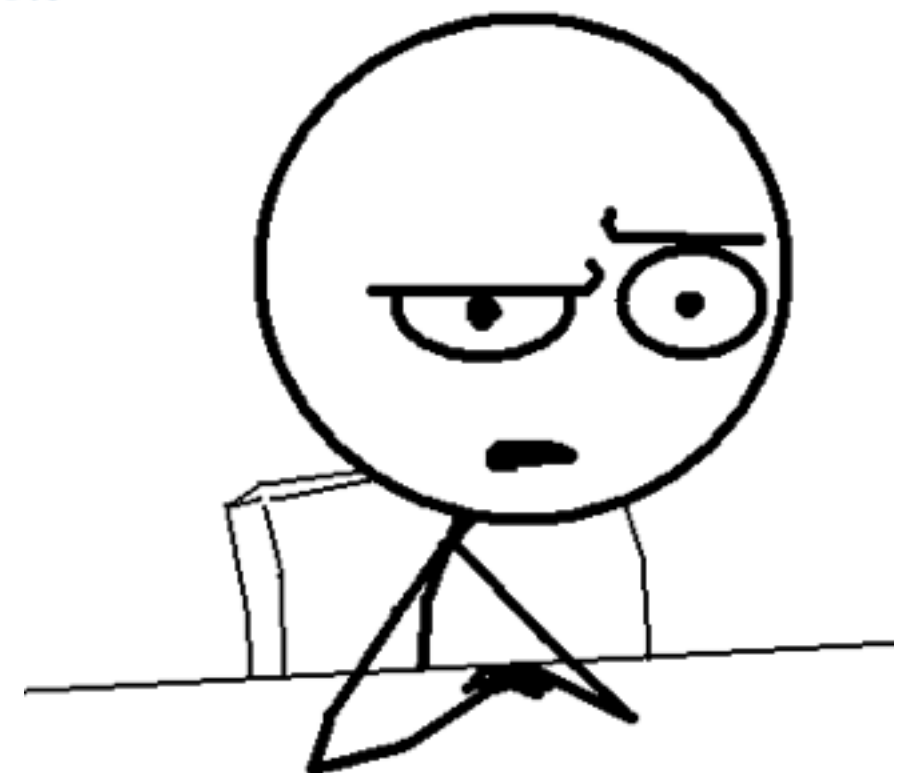
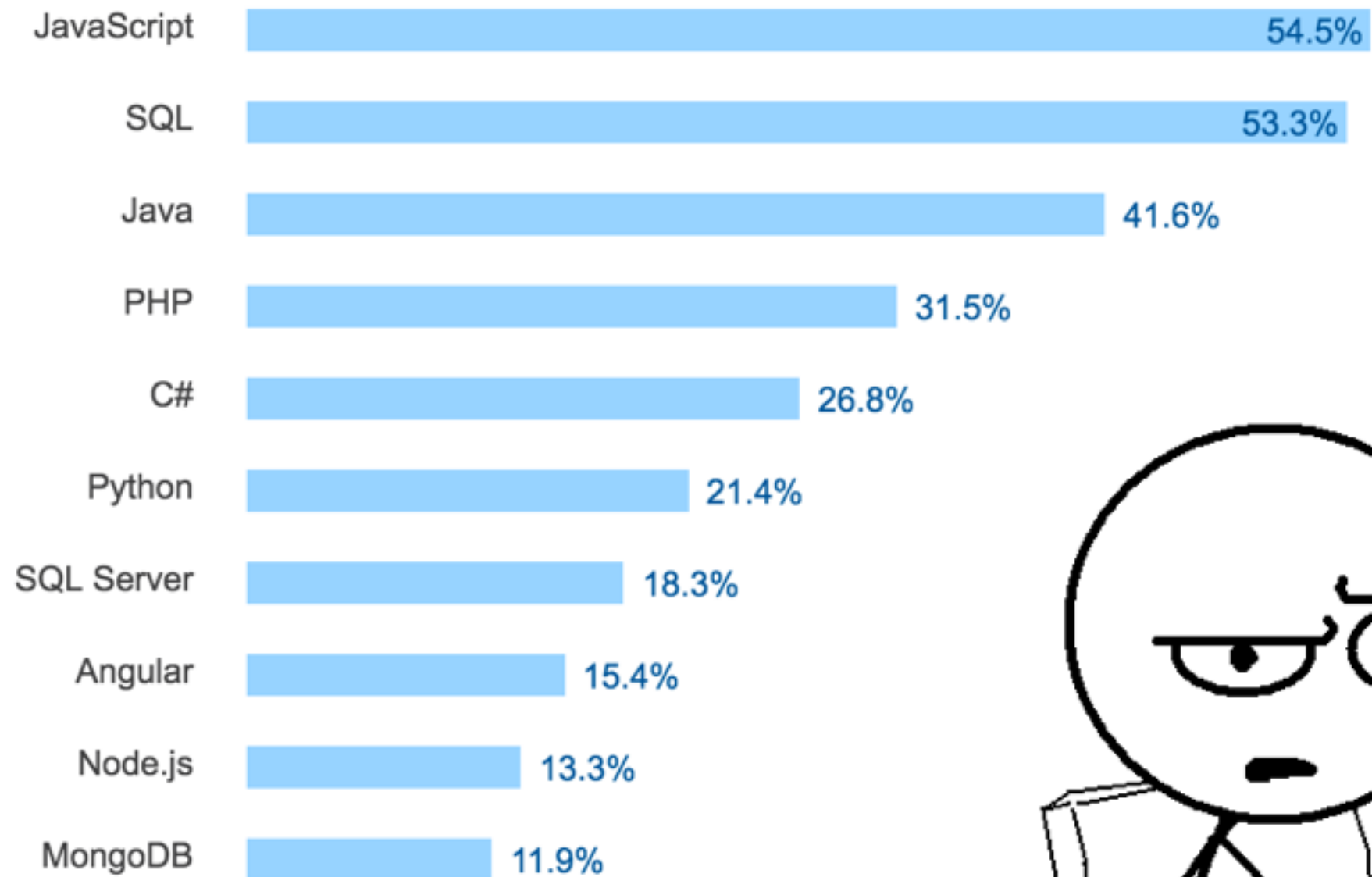
Front-End

Back-End

Mobile

Math & Data

Students



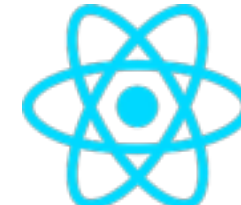
JS



Knockout.



canjs



2010

2011

2012

2013

2014

2015

2016



Love Undefined



Console

Search



top



Preserve log

What is the difference between undefined and function?

```
✖ ▶ "TypeError: undefined is not a function  
    at <anonymous>:8:1  
    at Object.InjectedScript._evaluateOn (<anonymous>:878:140)  
    at Object.InjectedScript._evaluateAndWrap (<anonymous>:811:34)  
    at Object.InjectedScript.evaluate (<anonymous>:667:21)"
```

Some JS function

```
function foo(a, b) {  
    if (a > b) {  
        return [a, b]  
    }  
}
```

```
foo(1, 2).join(',')
```

Who it works?

```
> function foo(a, b){  
  if (a > b) {  
    return [a, b]  
  }  
}
```

```
< function foo(a, b){  
  if (a > b) {  
    return [a, b]  
  }  
}
```

```
> foo(1, 2).join(',')
```

```
✖ ▼ Uncaught TypeError: Cannot read property 'join' of undefined(...)  VM242:2  
    (anonymous function) @ VM242:2  
    InjectedScript._evaluateOn @ VM224:878  
    InjectedScript._evaluateAndWrap @ VM224:811  
    InjectedScript.evaluate @ VM224:667
```



flow

Use Flow

code.js:9

9: `foo(1, 2).join(',')`

^^ call of method `join`. Method cannot be called on possibly undefined value

9: `foo(1, 2).join(',')`

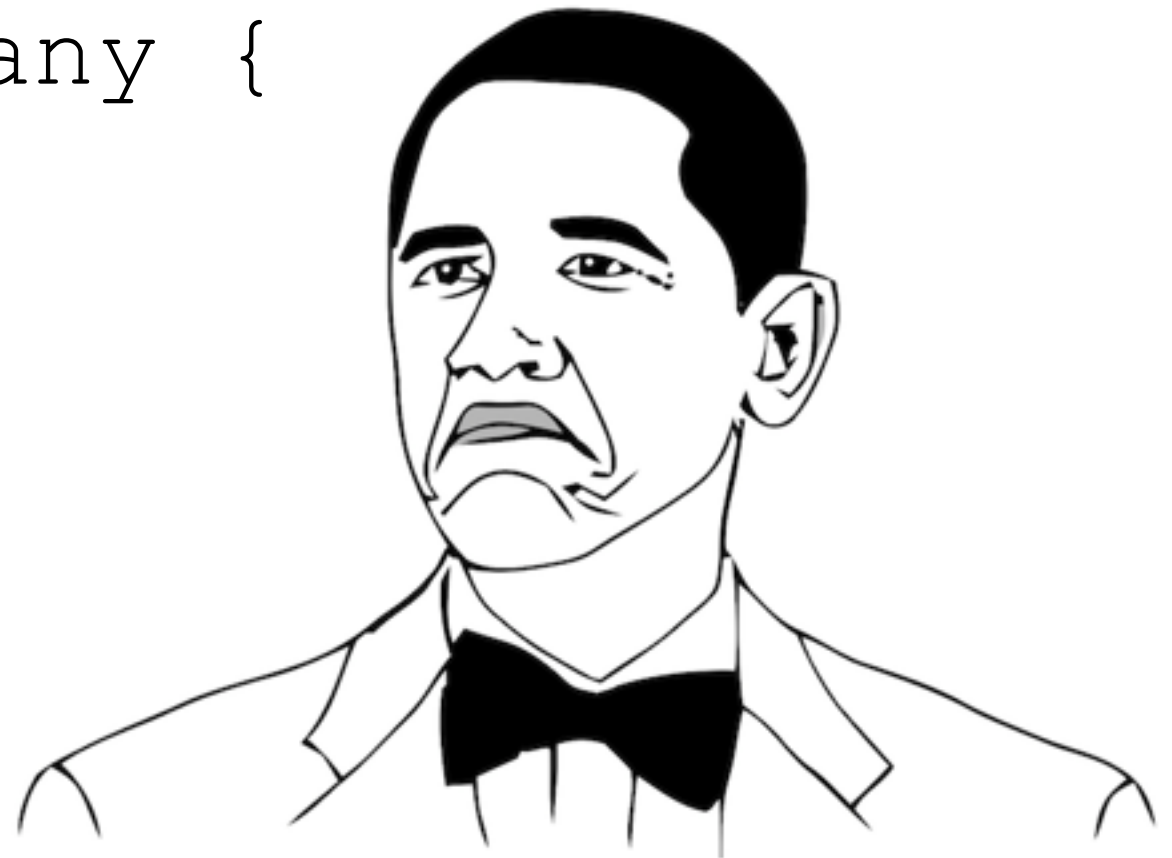
^^^^^^^^^^^^ undefined

Found 1 error

Flow Hack

```
function foo(a, b): any {  
    if (a > b) {  
        return [a, b]  
    }  
}
```

```
foo(1, 2).join(',')
```



NOT BAD

Reality

Found 0 errors

```
> foo(1, 2).join(',')
```

✖ ▼ Uncaught TypeError: Cannot read property 'join' of undefined(...)
(anonymous function) @ [VM398:2](#)
InjectedScript._evaluateOn @ [VM94:878](#)
InjectedScript._evaluateAndWrap @ [VM94:811](#)
InjectedScript.evaluate @ [VM94:667](#)



ELM

Evan Czaplicki

the best of functional programming in your browser
writing great code should be easy ... now it is

Rewrite to Elm

```
foo : Int -> Int -> List Int
foo a b =
    if a > b then a :: b :: []
```

```
main : Element
main =
    show (String.join "," (foo 1 2))
```

Elm Compilation

Detected errors in 1 module.

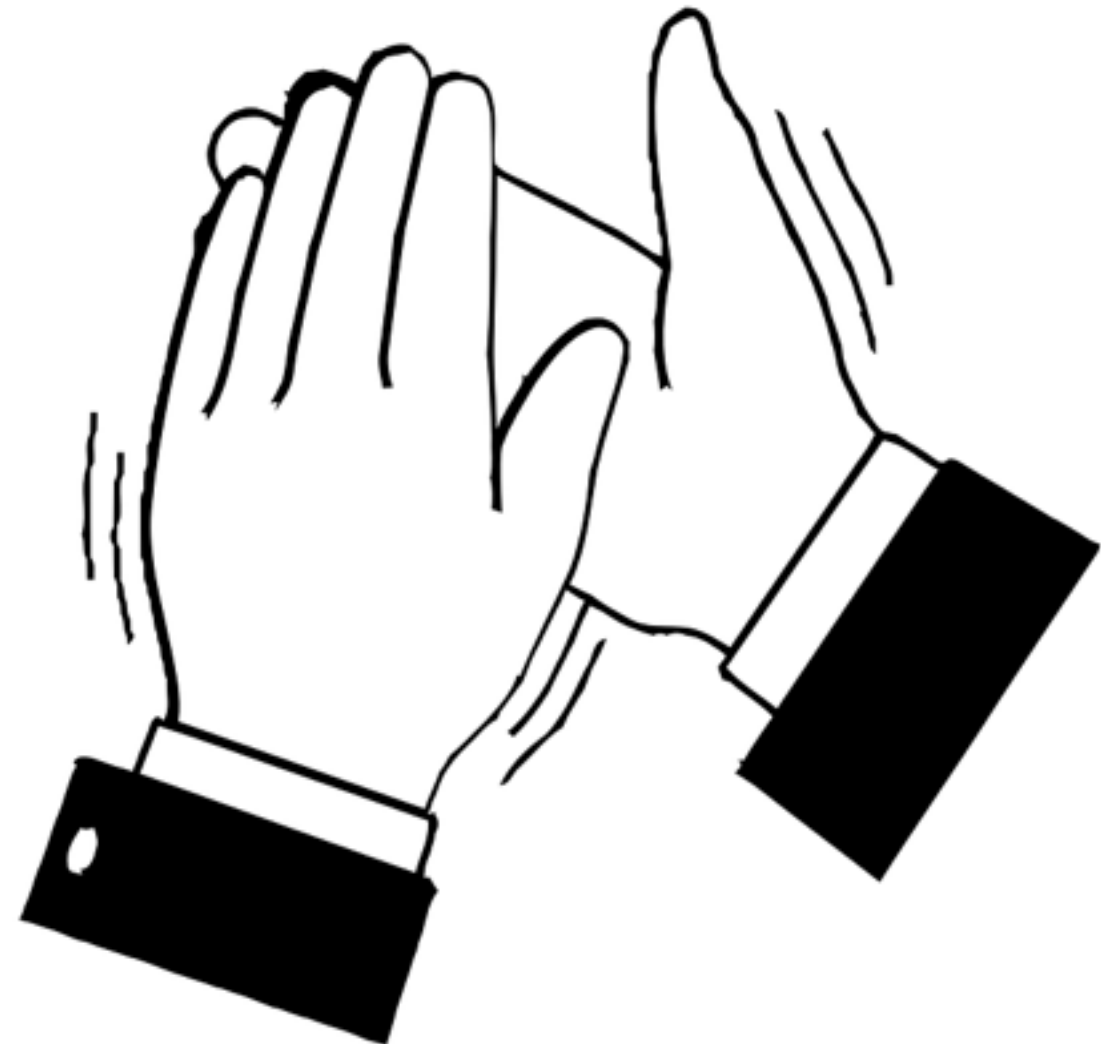
-- SYNTAX PROBLEM ----- index.elm

I need whitespace, but got stuck on what looks like a new declaration. You are either missing some stuff in the declaration above or just need to add some spaces here:

```
7| main : Element
   ^
```

I am looking for one of the following things:

whitespace



Pure Function

```
function firstFoo (x) {  
  return x + x  
}
```

```
function secondFoo (x) {  
  calc()  
  return x + x  
  ...  
}
```

SO?

> firstFoo(1)

< 2

> secondFoo(1)

Something went wrong...

VM1010:11

< 16

> secondFoo(1)

Something went wrong...

VM1010:11

< 18

> secondFoo(1)

Something went wrong...

VM1010:11

< 12

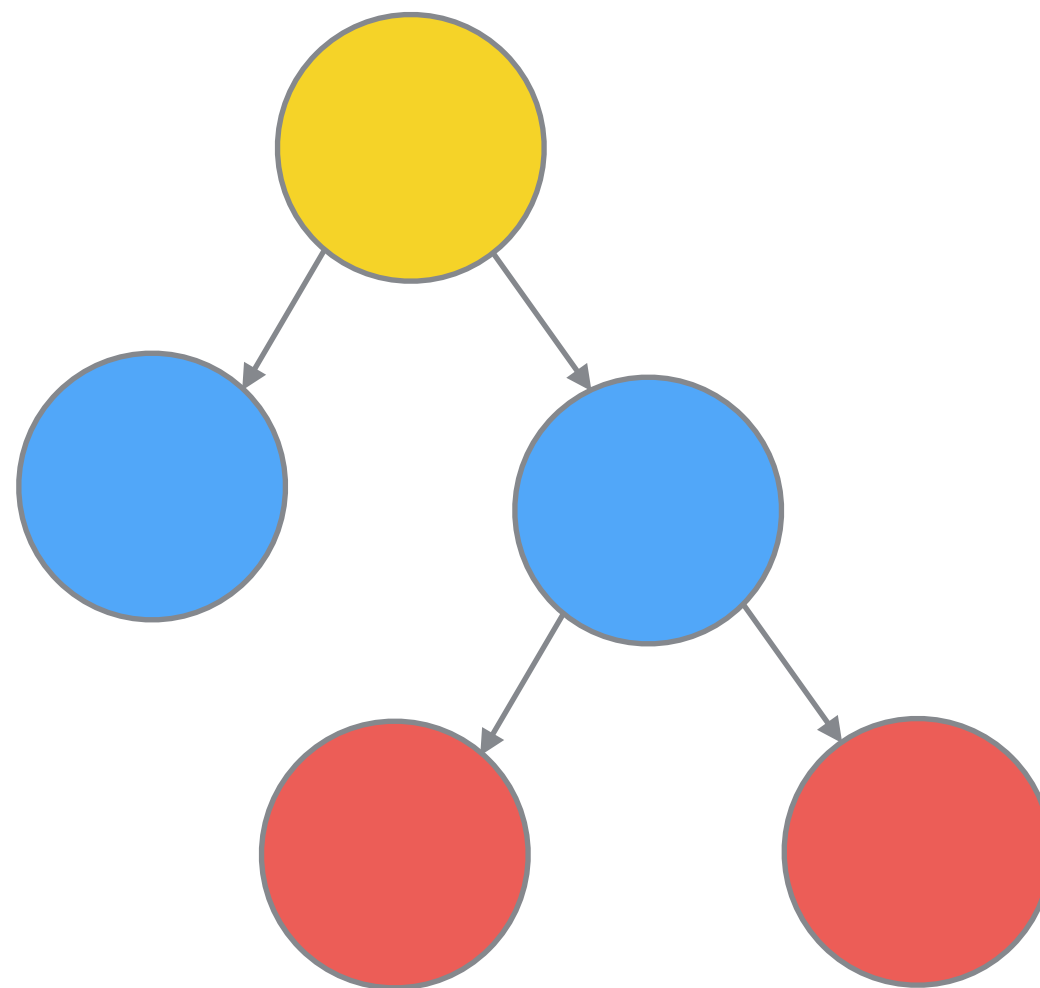
>

Stateless

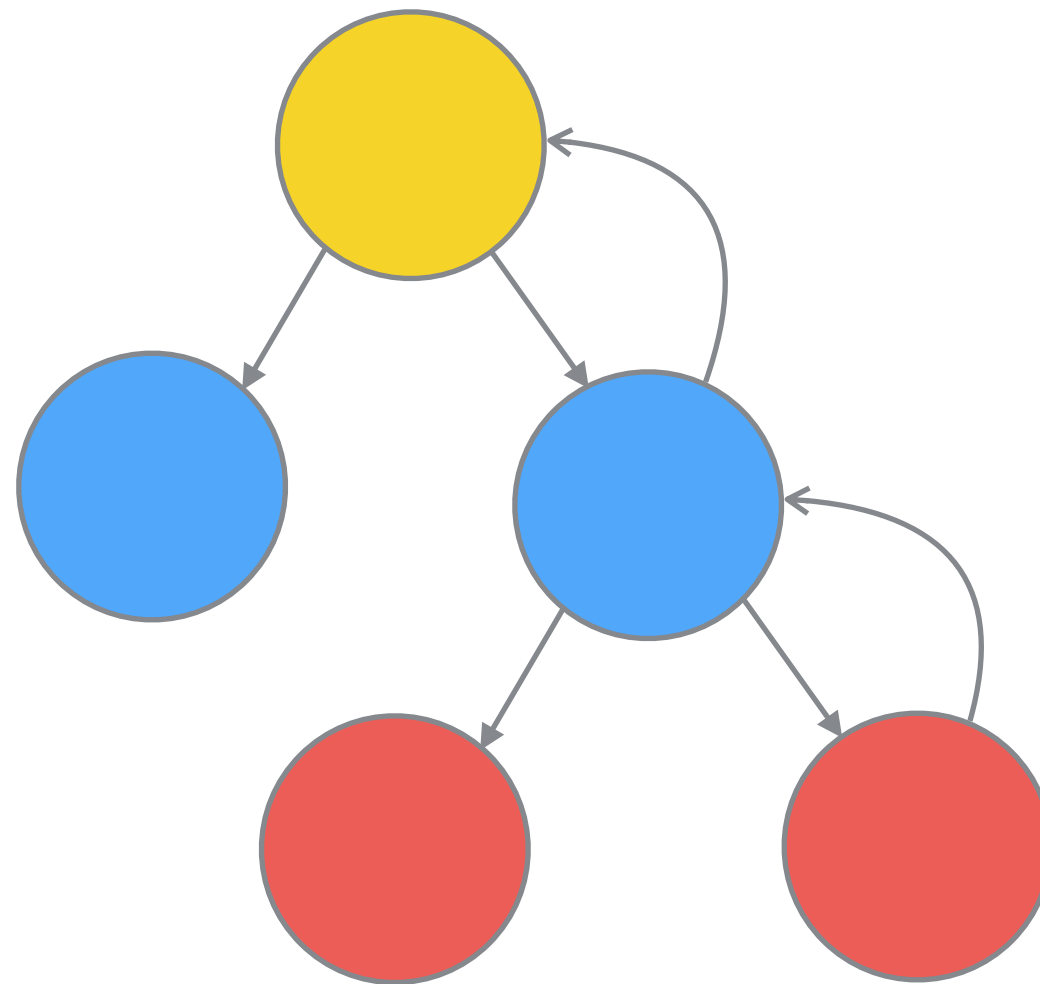
```
> foo = {a = 1, b = 2}
{ a = 1, b = 2 } : { a : number, b : number' }
> {foo | a = foo.b + 2}
{ a = 4, b = 2 } : { b : number, a : number }
> foo
{ a = 1, b = 2 } : { a : number, b : number' }
> █
```

Architecture

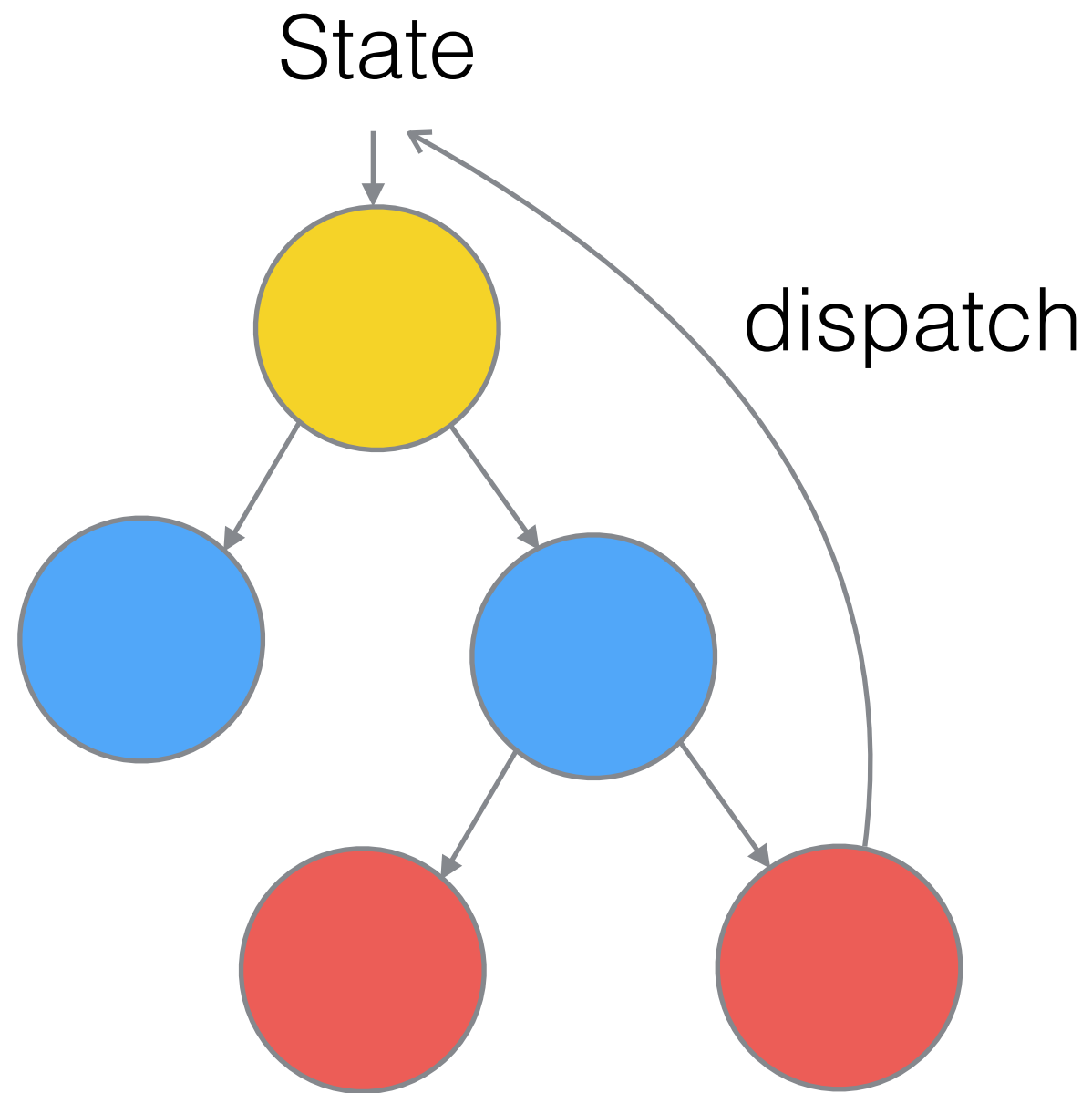
React



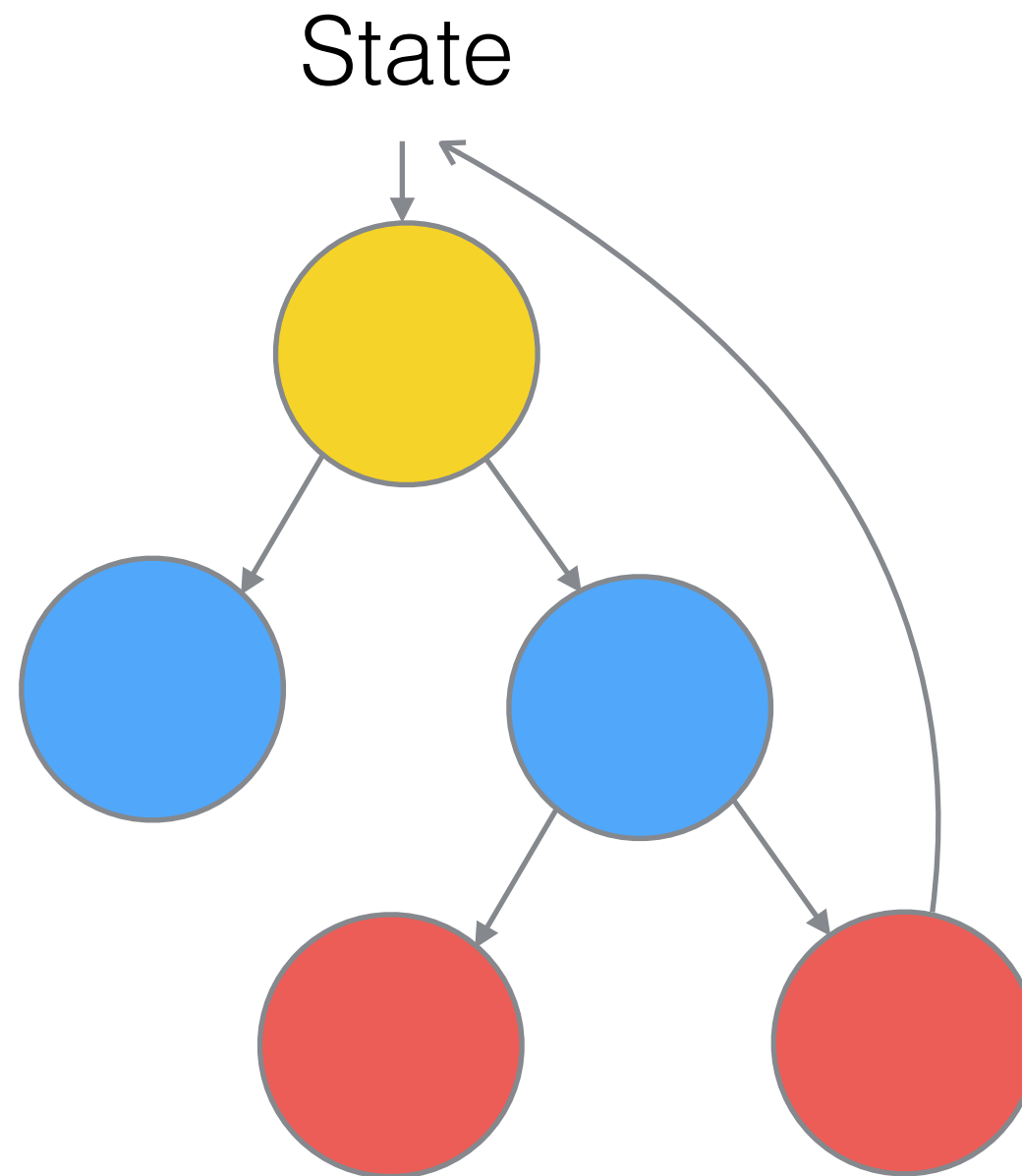
React App Events



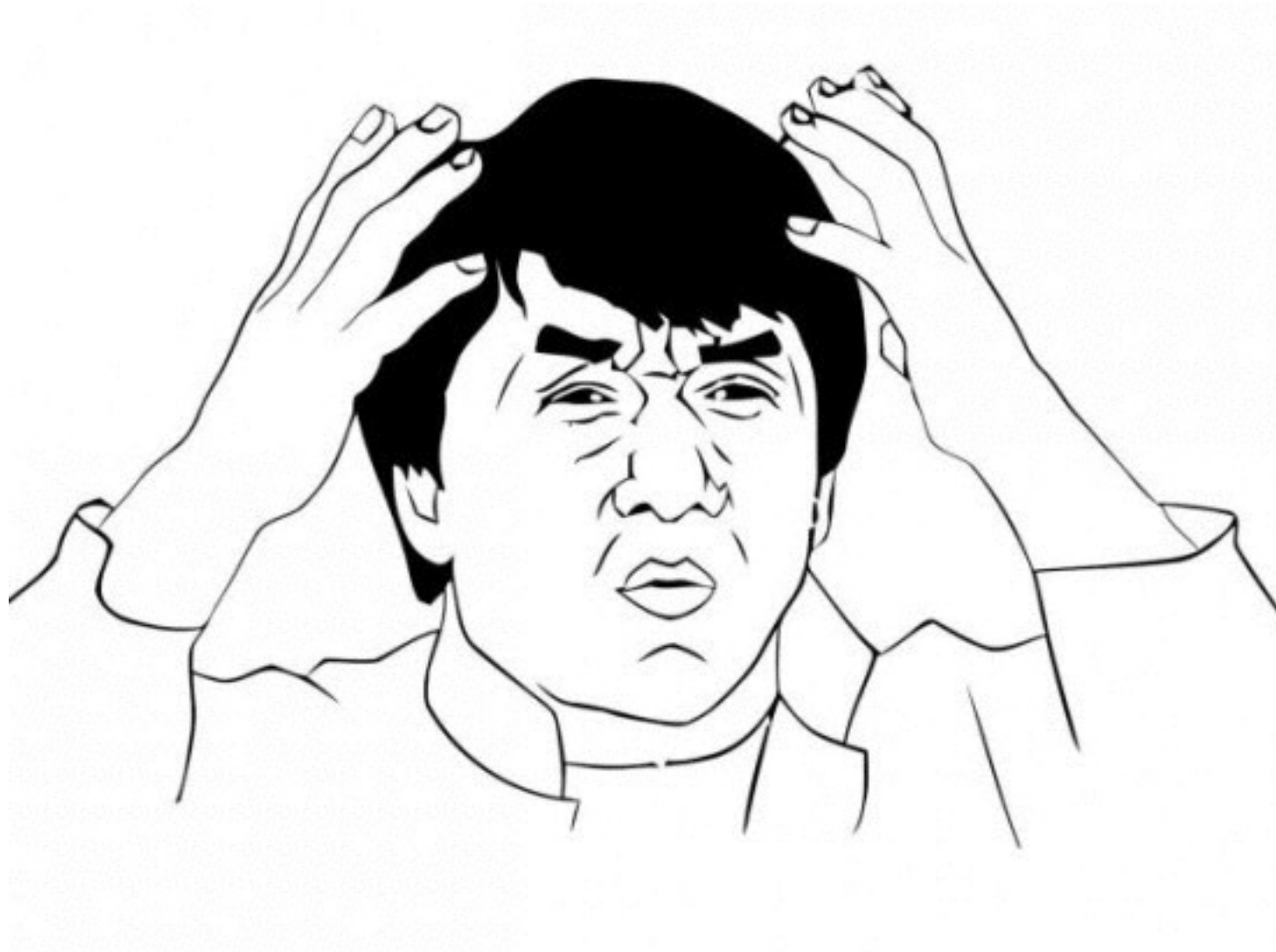
Redux/Flux



Elm App

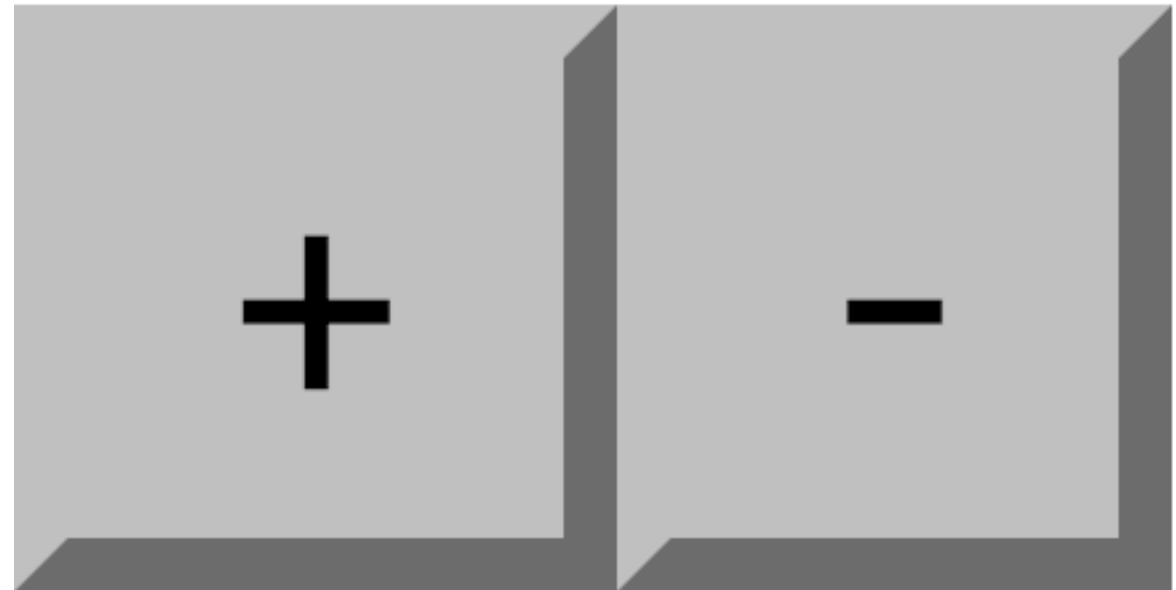


Stop. Redux === ELM?



How it works?





Example

2

Start App

React/Redux

```
let initialState = 0
let store = createStore(reducer, initialState)

class Page extends Component {
  render () {
    return (
      <Provider store={store}>
        <ConnectView />
      </Provider>
    )
  }
}
```

ELM

```
initialModel : Int  
initialModel = 0
```

```
main : Signal Html  
main =  
    StartApp.start  
    { model = initialModel  
    , view = view  
    , update = update  
    }
```

View

React/Redux

```
class View extends Component {  
  
  static propTypes = {  
    value: PropTypes.number.isRequired  
  };  
  
  render () {  
    const {dispatch, value} = this.props  
    return (  
      <div>  
        <button  
          onClick={() => dispatch({type: "INCREMENT"}) }  
          value="+" />  
        <button  
          onClick={() => dispatch({type: "DECREMENT"}) }  
          value="-" />  
        <p>{value}</p>  
      </div>  
    )  
  }  
}
```

ELM

```
view : Signal.Address Action -> Int -> Html
view address value =
  div []
    [ button [ onClick address Increment ] [ text "+" ]
    , button [ onClick address Decrement ] [ text "-" ]
    , p [ ] [ text (toString value) ]
    ]
```

Update

React/Redux

```
let reducer = (state = initialState, action) => {  
  switch (action.type) {  
    case "INCREMENT":  
      return state + 1  
    case "DECREMENT":  
      return state - 1  
    default:  
      return state  
  }  
}
```

ELM

```
type Action
  = NoOp
  | Increment
  | Decrement
```

```
update : Action -> Model -> Model
update action model =
  case action of
    NoOp ->
      model
    Increment ->
      model + 1
    Decrement ->
      model - 1
```

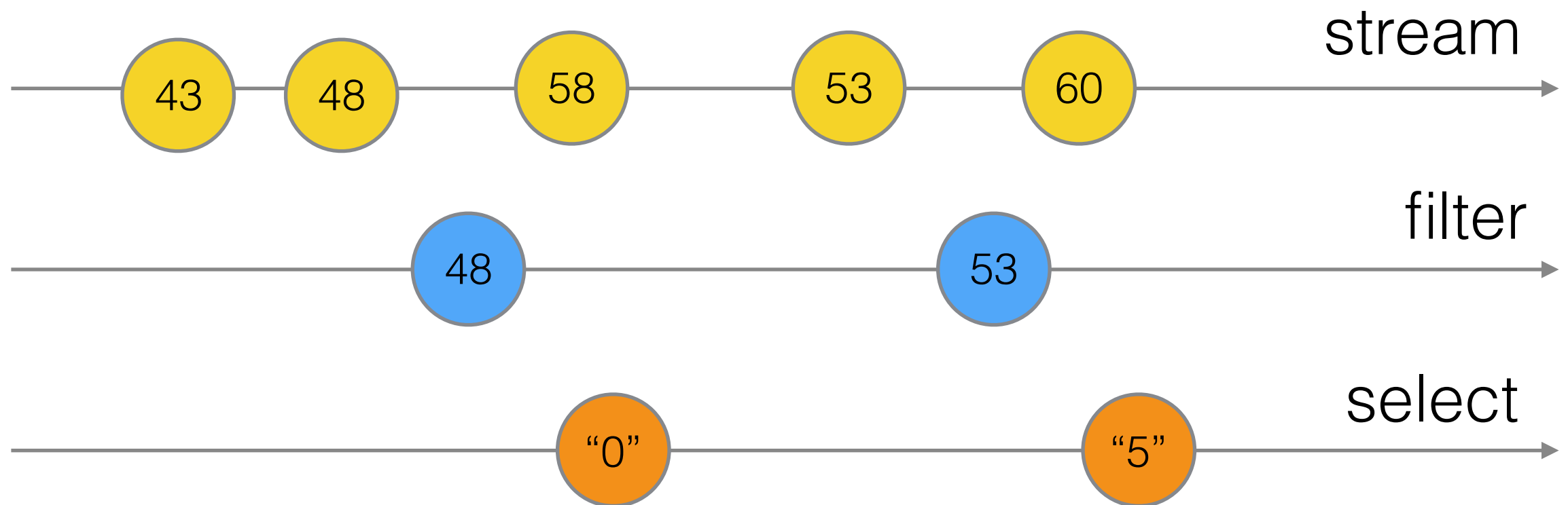
FRP

RX.js

Rx.DOM

```
.keypress (body)
.filter (x => x.charCodeAt >= 48 && x.charCodeAt <= 57)
.select (x => String.fromCharCode (x.charCodeAt) )
.subscribe (x => app.innerHTML = x)
```

Rx.js



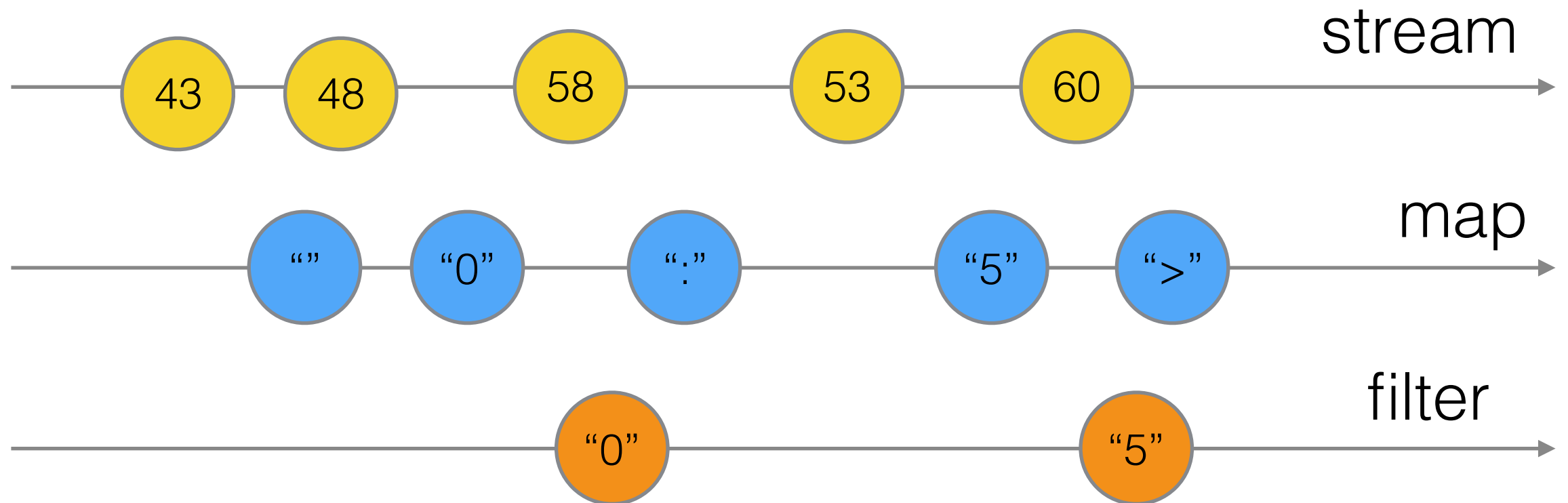
Elm

```
characters : Signal Char
characters =
    Signal.map Char.fromCode Keyboard.presses
```

```
numbers : Signal Char
numbers =
    Signal.filter Char.isDigit '0' characters
```

```
main : Signal Element
main =
    Signal.map show numbers
```

Elm



Problem

Server Side Rendering

Small community

Not the best tool for every task

Early day still

What Next?

<http://elm-lang.org/>

<https://www.reddit.com/r/elm>

<http://elmlang.herokuapp.com/> - Slack

<https://medium.com/@diamondgfx> - ELM tutorial

<https://github.com/isRuslan/awesome-elm>

Bonus



Richard Feldman

NoRedInk

Any Question?