
FUNCTIONAL
PROGRAMMING
Why should
you care?

Before we start…

MOTIVATION
FOR THIS TALK

Before we start…

SEMI-FORMAL *DEFINITION*

AGENDA

- What makes FP relevant?
- Features of FP (some present in JS)
- CODE!

FP IS RELEVANT FOR 3 REASONS

HIPSTER

HIPSTER

Closures

Generics

Garbage collection

Code as data

Monads

Lazy evaluation

Pattern Matching

Lexical Scope

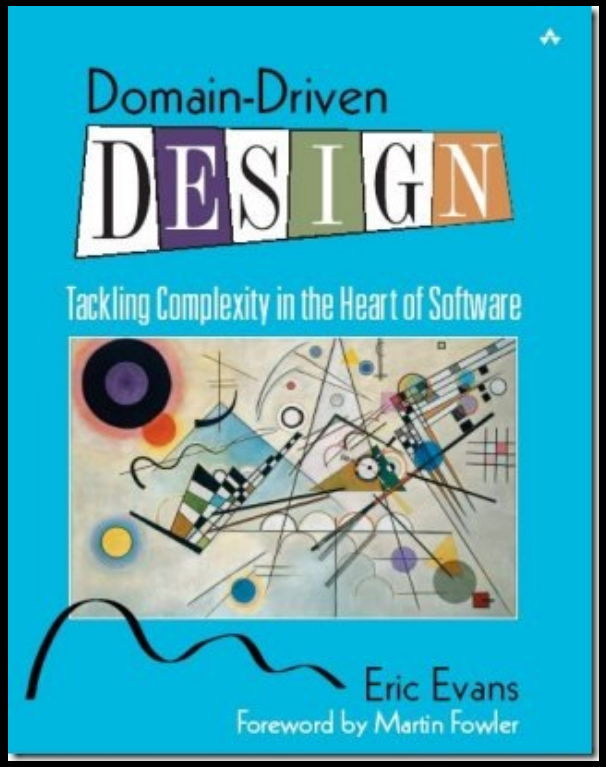
DEBUNKS MITHS

DEBUNKS MITHS

Recursion

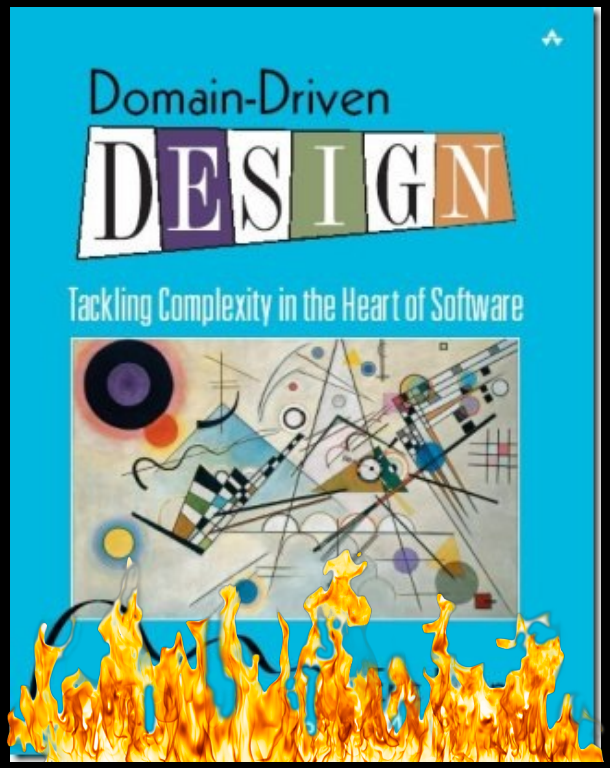
Mutation

DEBUNKS MITHS



DEBUNKS MITHS

Rick Hickey
(clojure)



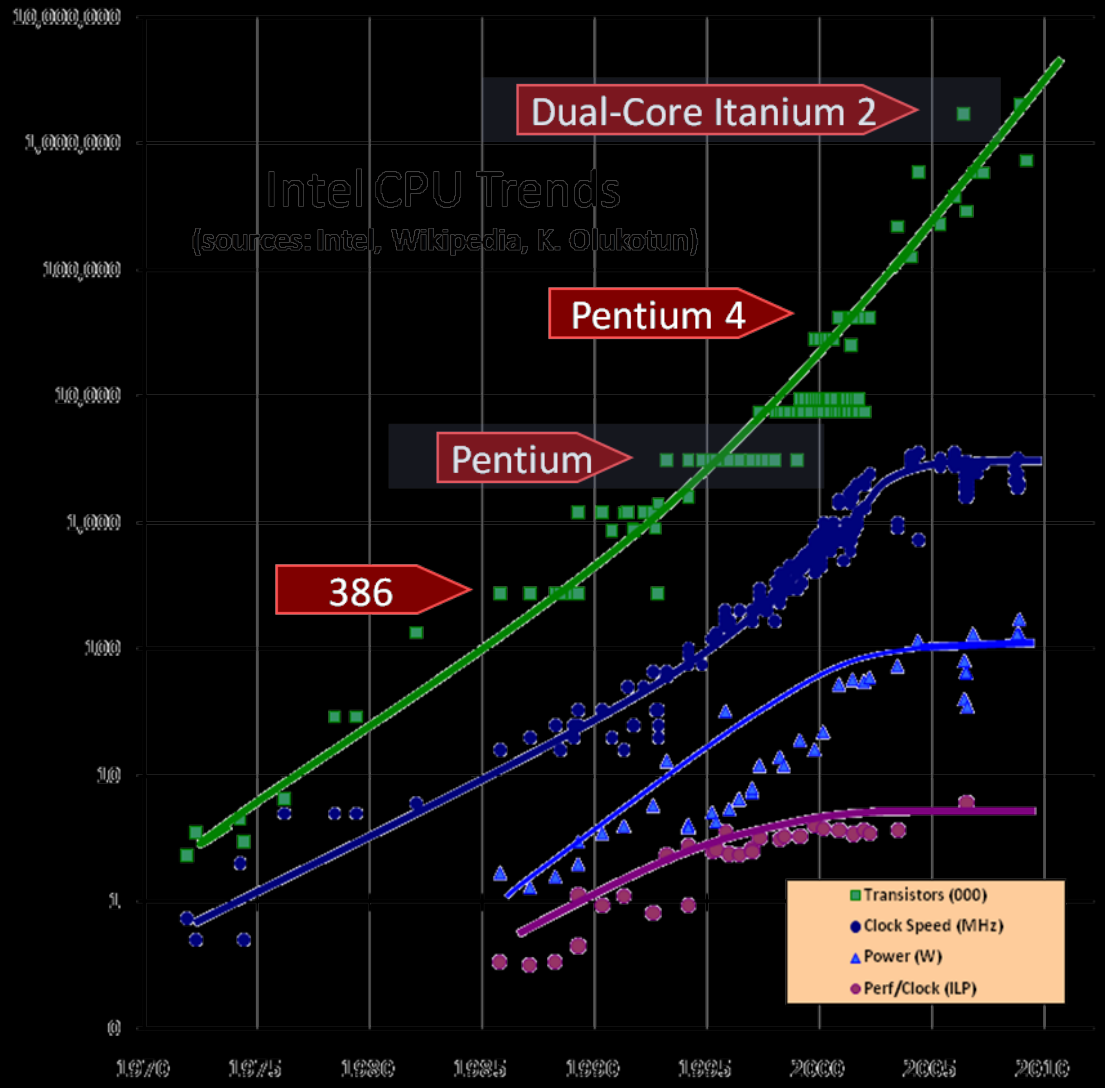
SCALABILITY

B M H

SCALABILITY

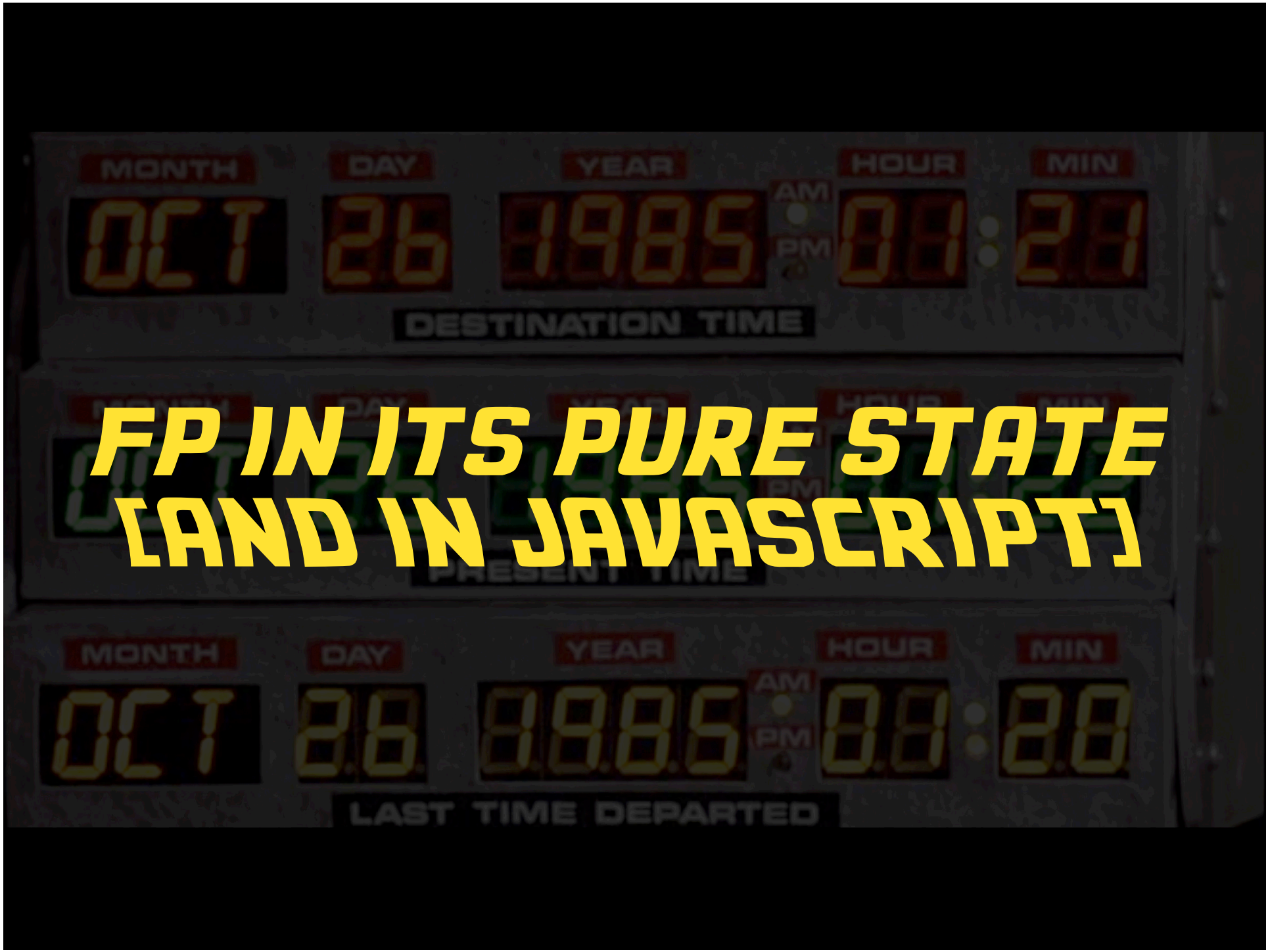
Buy More Hardware

SCALABILITY



SCALABILITY

Launch More Instances



FP IN ITS PURE STATE [AND IN JAVASCRIPT]

LEXICAL SCOPE

```
(*  Takes a date and returns a string of the
    form January 20, 2013 (for example). *)
fun date_to_string (date: int * int * int) =
    let
        val month_names = ["January", "February", "March",
            "April", "May", "June", "July", "August",
            "September", "October", "November", "December"]
        val month = get_nth(month_names, #2 date)
        val day = Int.toString (#3 date)
        val year = Int.toString (#1 date)
    in
         month ^ " " ^ day ^ ", " ^ year
    end
```

LEXICAL SCOPE

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        val year = Int.toString (#1 date)
    in
         month ^ " " ^ day ^ ", " ^ year
    end
```

```
var x = 2, y = 3;
function someAdd() {
    var x = 4;
    return x + y;
}
someAdd();
```

CLOSURES

```
(*  Takes a string list and returns a string list that has only
    the strings in the argument that start with an uppercase letter. *)
val only_capitals =
    List.filter (fn x => Char.isUpper(String.sub(x, 0)) )
```

CLOSURES

```
(*  Takes a string list and returns a string list that has only
    the strings in the argument that start with an uppercase letter. *)
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```

```
http.get("www.google.com, function (res) {
        ....
        res.on('data', function(chunk) {
          ...
        }).on('end', function() {
          .....
        });
```

FIRST ORDER FUNCTIONS

```
applyTwice :: (a -> a) -> a -> a
applyTwice f x = f (f x)

map :: (a -> b) -> [a] -> [b]
map _ [] = []
map f (x:xs) = f x : map f xs

ghci> map (+3) [1,5,3,1,6]
[4,8,6,4,9]

ghci> map (negate . sum . tail) [[1..5],[3..6],[1..7]]
[-14,-15,-27]
```

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```
fn.apply
_.map…
_.compose
```

CURRYING

```
multThree :: (Num a) => a -> a -> a -> a
multThree x y z = x * y * z

ghci> let multTwoWithNine = multThree 9
ghci> multTwoWithNine 2 3
54
ghci> let multWithEighteen = multTwoWithNine 2
ghci> multWithEighteen 10
180
```

CURRYING

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```

_.partial…

CODE AS DATA

```
(define (sequence low high stride)
  (if (> low high)
      null
      (cons low (sequence (+ low stride) high stride))))
```

```
; sequence test
(check-equal? (sequence 0 5 1) (list 0 1 2 3 4 5) "Sequence test")
```

CODE AS DATA

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```

```
; sequence test
(check-equal? (sequence 0 5 1) (list 0 1 2 3 4 5) "Sequence test")
```

```
{"menu": {
  "id": "file",
  "value": "File",
  "popup": {
    "menuitem": [
      {"value": "New",
"onclick":
"CreateNewDoc()"},
```


SHOW
ME THE
MONEY!

CONCLUSIONS


I'M NOT SAYING QUIT JS AND GO HASKELL...
BUT QUIT JS AND GO HASKELL
HISTORY.COM
memegenerator.net

LANGUAGES

Static: ML (primero), Haskell

Dynamic: Racket, Clojure, Scheme (i.e. a Lisp)

Scala???

LIBRARIES

Q (https://github.com/kriskowal/q)
RSVP (https://github.com/tildeio/rsvp.js)
FutureJS (https://github.com/FuturesJS/FuturesJS)
Promised-io (https://github.com/kriszyp/promised-io)
Bacon(https://github.com/baconjs/bacon.js)
Fn.js(http://eliperelman.com/fn.js/)
Wu (http://fitzgen.github.io/wu.js/)
Fnky (https://github.com/leoasis/fnky)
Prelude (http://preludels.com/)

WATCH AND READ

"Hey Underscore, you're doing it wrong"

http://www.youtube.com/watch?v=m3svKOdZijA

"How to survive asynchronous programming in JS"

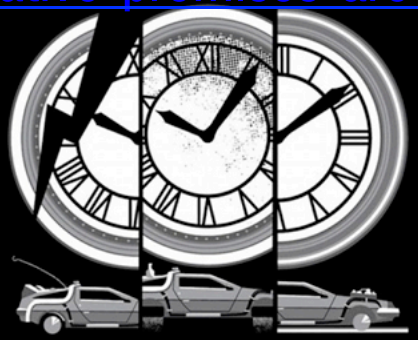
http://www.infoq.com/articles/surviving-asynchronous-programming-in-javascript

"Callbacks are imperative, Promises are Functional"

https://blog.jcoglan.com/2013/03/30/callbacks-are-imperative-promises-are-functional-nodes-biggest-missed-opportunity/

"Promises/A spec"

http://wiki.commonjs.org/wiki/Promises/A



TOPICS

Monads

Currying/Partial/Compose/Point-free

Benefits of no mutation

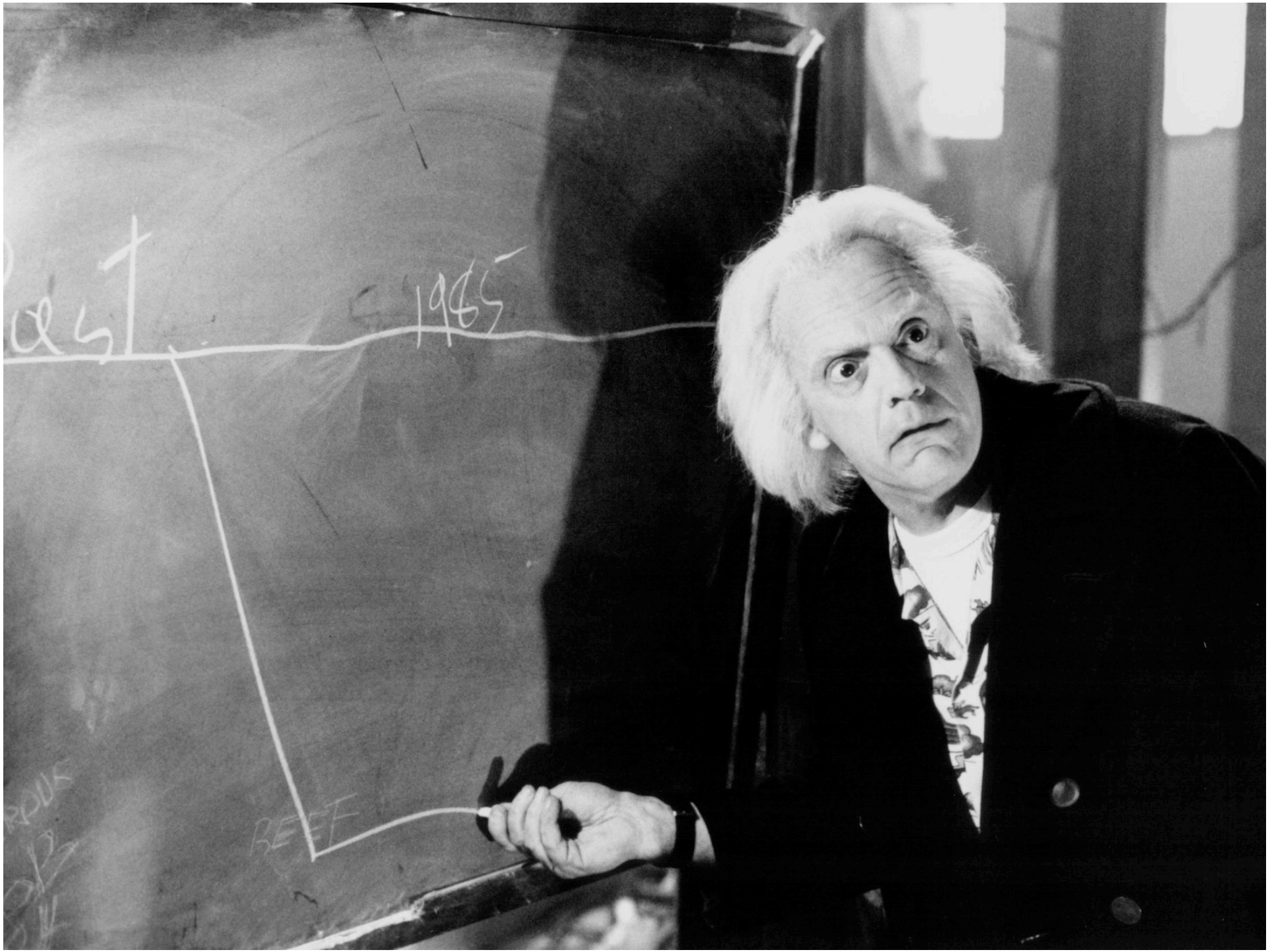
Promises/Futures

Subtyping/Generics

Lazyness

Libreries

Native support in JS


1965
REEF


github.com/holden-caulfield/
@jpsaraceno
CALIFORNIA
OUTATIME
THANKS!