

Flowtype Fundamentals

FIND A PLACE FOR TYPES AND FLOW



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What Are Types?



Type (data type)

A **classification** that is assigned to data
that a computer programming language will use
to understand **developer intent**
and how to **treat the data**



Primitive Types

Number

String

Boolean



Composite Types

Object

Set

Array



Types Matter

```
switch (typeof countdown) {  
  case "number":  
    if (countdown <= 0) fireZeMissles()  
    break  
  case "string":  
    console.log("invalid ignition code", countdown)  
    break  
}
```



Categories of Types



Some Terms

Static

Dynamic

Strong

Loose



Some Terms

Static

Compile time

Dynamic

Strong

Loose



Some Terms

Static

Compile time

Dynamic

Run time

Strong

Loose



Some Terms

Static

Compile time

Dynamic

Run time

Strong

Strict assignment

Loose



Some Terms

Static

Compile time

Dynamic

Run time

Strong

Strict assignment

Loose

Implicit conversion



Some Terms

Static

Compile time

Dynamic

Run time

Strong

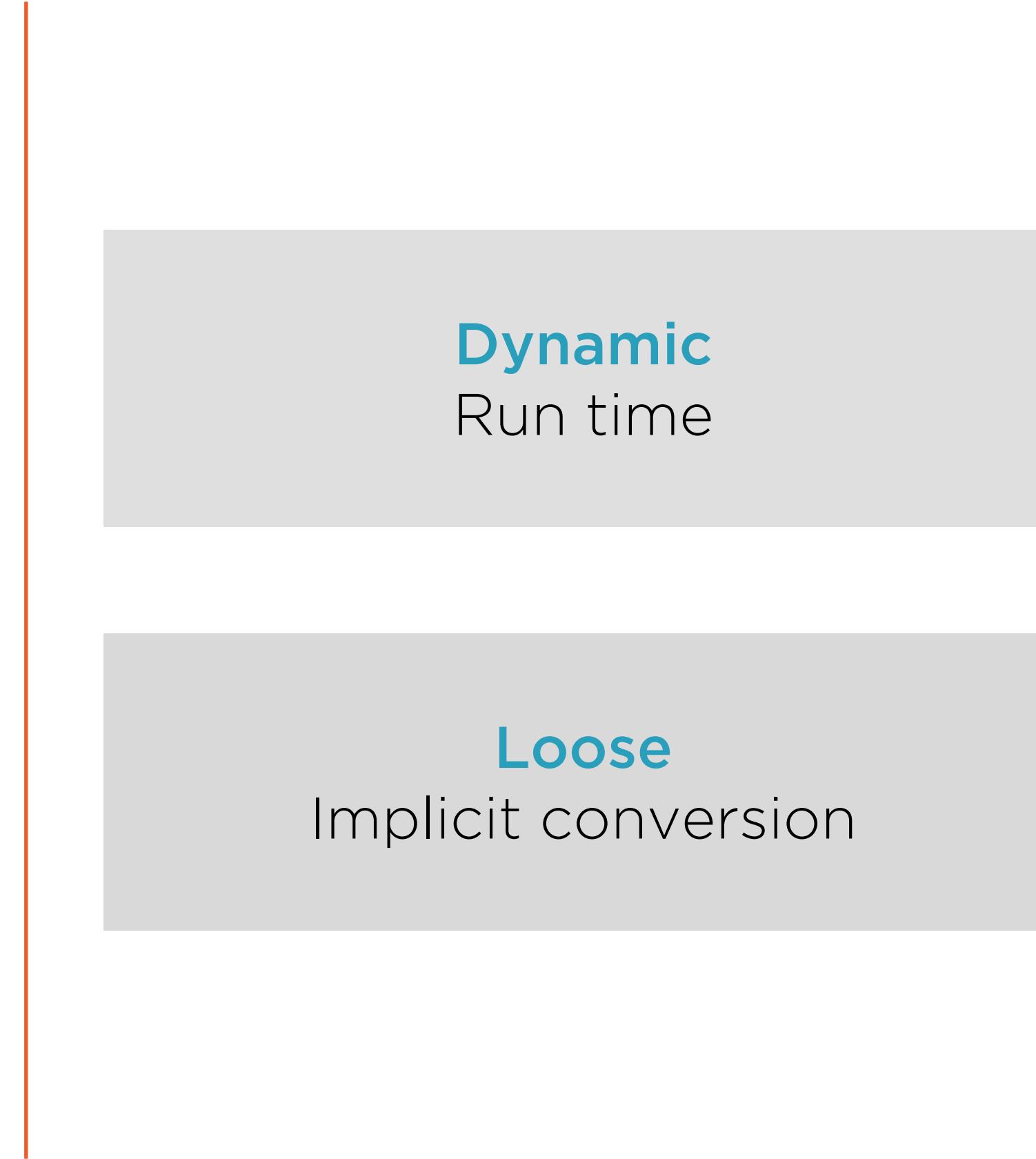
Strict assignment

Loose

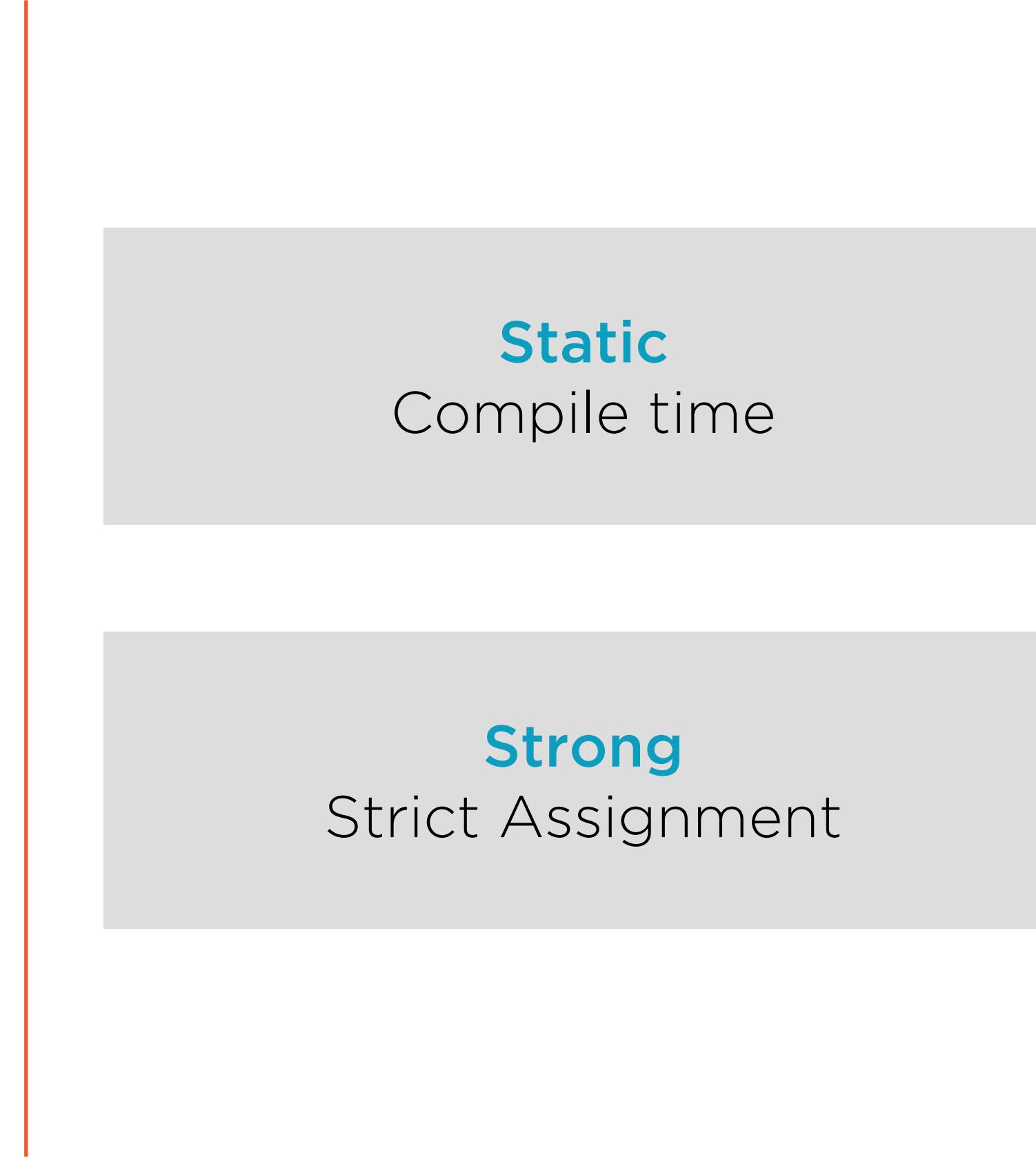
Implicit conversion



JavaScript



JavaScript with Flow



JavaScript's Existing Types



Is JavaScript type**less**?



Is JavaScript type**less**?
No



Is JavaScript type**less**?
No

(It just doesn't have very many)



Six Primitives

boolean

null

undefined

number

string

symbol



One Composite



object



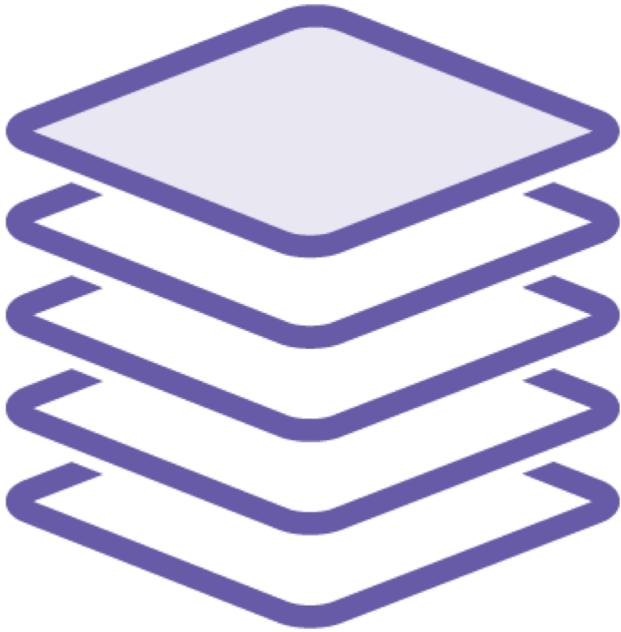
How many types do I **want**?



What Is Flow?



Layer of Types



Flow (types!)

JavaScript



```
const someCondition: boolean = // ...
```

Type Annotation



infers this is a boolean

knows this returns a boolean

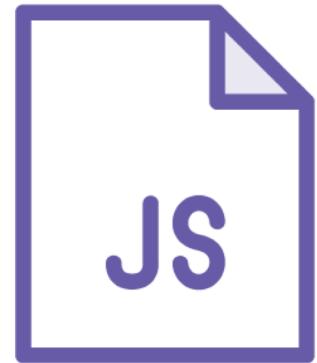
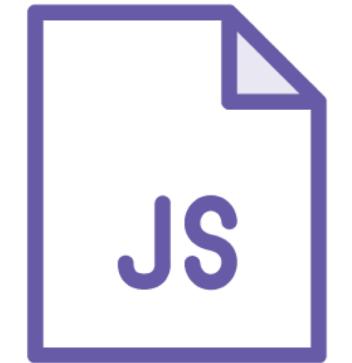
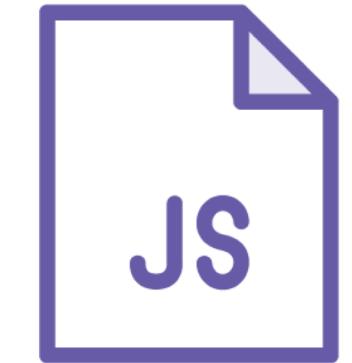
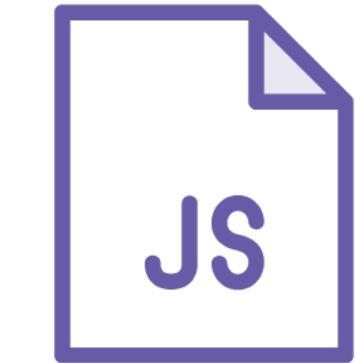
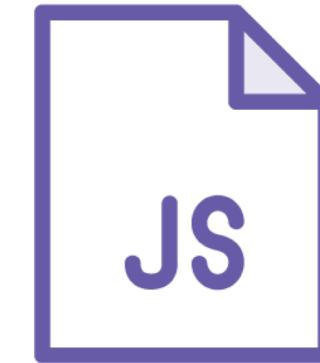
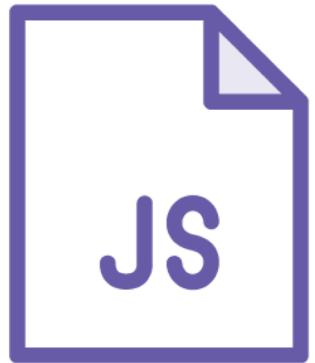
```
const someCondition = someFunctionThatReturnsBoolean()
```

Type Inference



Covered by Flow

Not yet!



Gradual Typing



“Cannot use someCondition...
because it's not a boolean.”

Feedback



Increase Quality & Correctness

```
~/dev/myProject $ flow
```

No errors!



Origins of Flowtype



Why Did Facebook Make It?

2011, growth of React, JS explosion
Ways to reason about code
Developer experience



Flow into the Future



Current day:

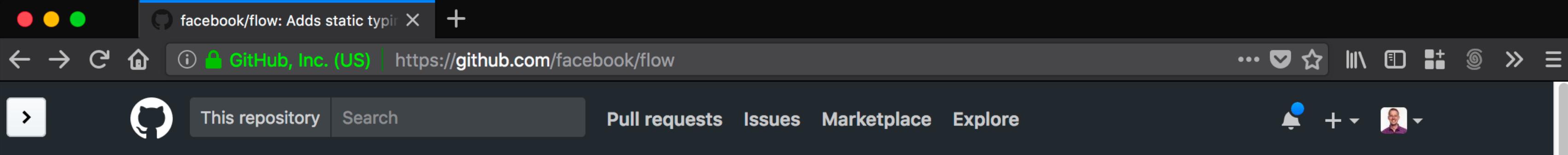
Static type analysis



Future:

Platform for other tools - optimizing compilation, editor integrations, deep refactoring tools, security analysis



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Adds static typing to JavaScript to improve developer productivity and code quality. <https://flow.org/>

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 cpojer and facebook-github-bot [PR] Add backgroundPositionX and backgroundPositionY style attributes.	...	Latest commit bf2ba3b 3 hours ago
 .circleci	install tool yarn deps properly in CI	20 days ago
 .github	[PR] ISSUE_TEMPLATE.md	9 months ago
 examples	remove flux-chat example	20 days ago
 hack	[hack] Return unprocessed items from cancelled jobs (so they can be r...	10 days ago
 js	Kill merge job after timeout	2 months ago
 lib	[PR] Add backgroundPositionX and backgroundPositionY style attributes.	3 hours ago
 newtests	Lazy mode message for flow status	3 days ago

Flow Compared to Others



Closest Competitor Is TypeScript

- Larger superset; more than just types**
- Compiles back to JavaScript**
- Close today; potential to diverge further**
- Supported by Microsoft; active; momentum**
- Community type sharing**
- Strong tooling**
- Variance in feature support**



Compile-to-JS Languages

Type safety as a goal
Examples: ReasonML and Elm
Much different from JS
Roots in functional programming



Flow Differentiators

Just annotations
Prime option for staying in JS
Gradual option on top of JS project



Should I use **Flow**?



Remain in JavaScript-land

Highly-invested, skilled

Talent pool

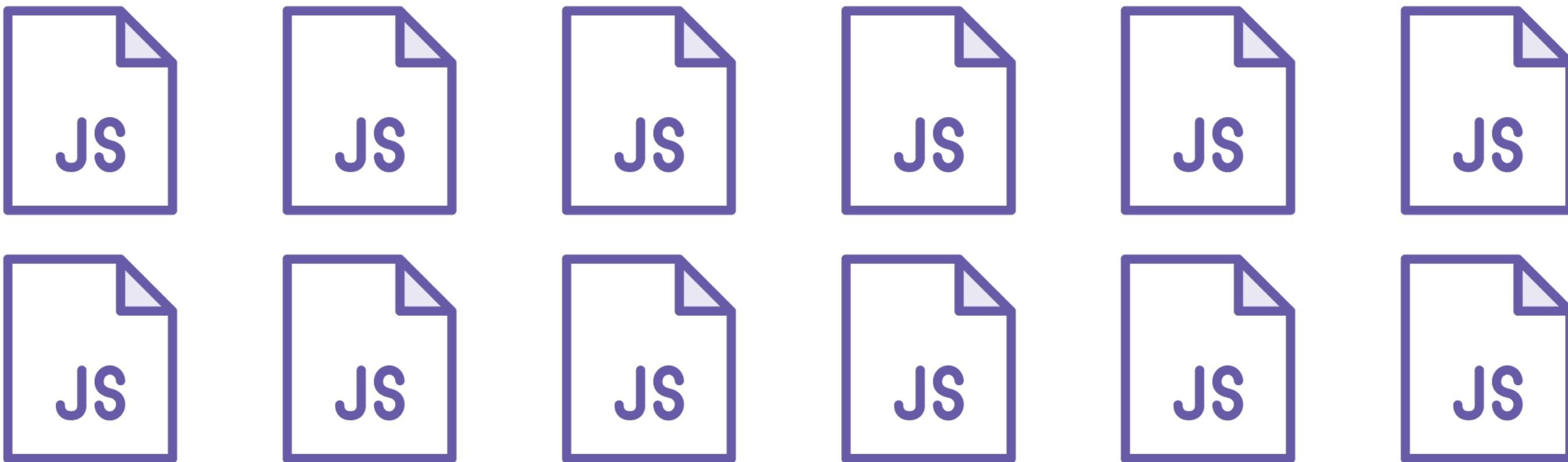
Technical/cultural barriers to a new language

Love it

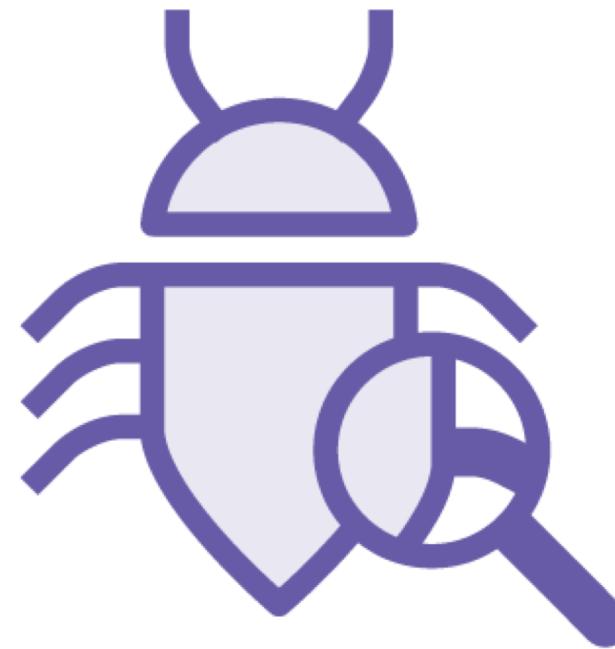


A Growing Codebase

Covered by Flow



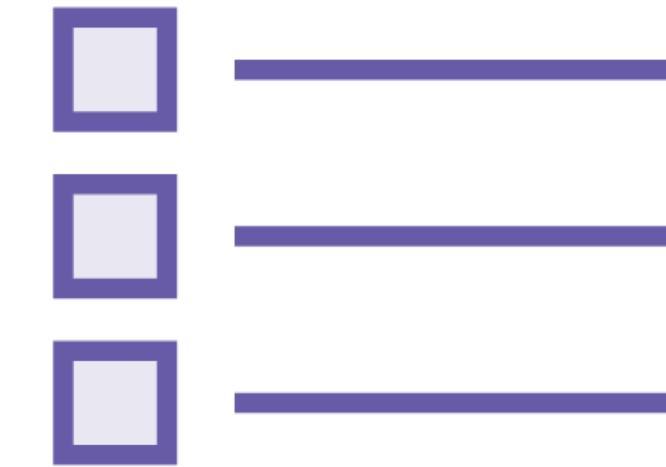
Increase Your Confidence



Correctness



Readability



Feedback