FULL STACK DEVELOPMENT - JAVASCRIPT

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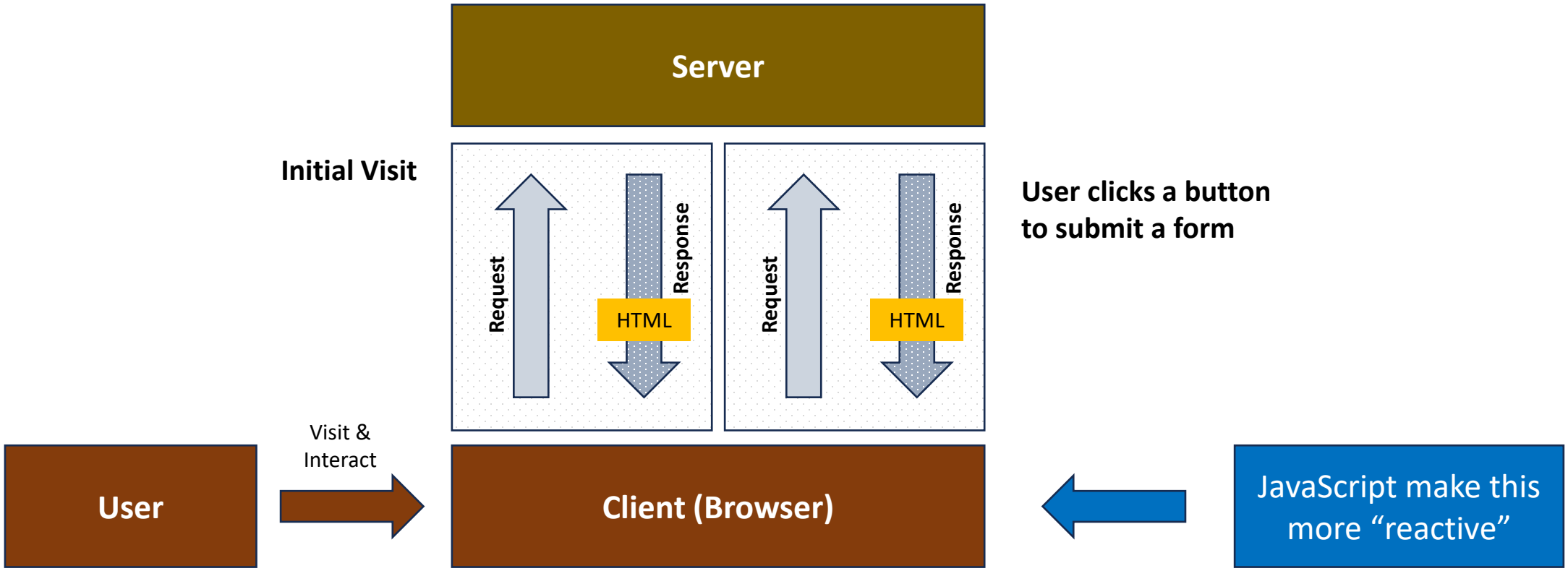
What is JavaScript

JavaScript is a **dynamic, weakly typed** programming language which is **compiled at runtime**. It can be executed as part of a webpage in a browser or directly on any machine ("host environment").

JavaScript was created **to make webpages more dynamic** (e.g. change content on a page directly from inside the browser). Originally, it was called LiveScript but due to the popularity of Java, it was renamed to JavaScript.

JavaScript is totally independent from Java and has nothing in common with Java!

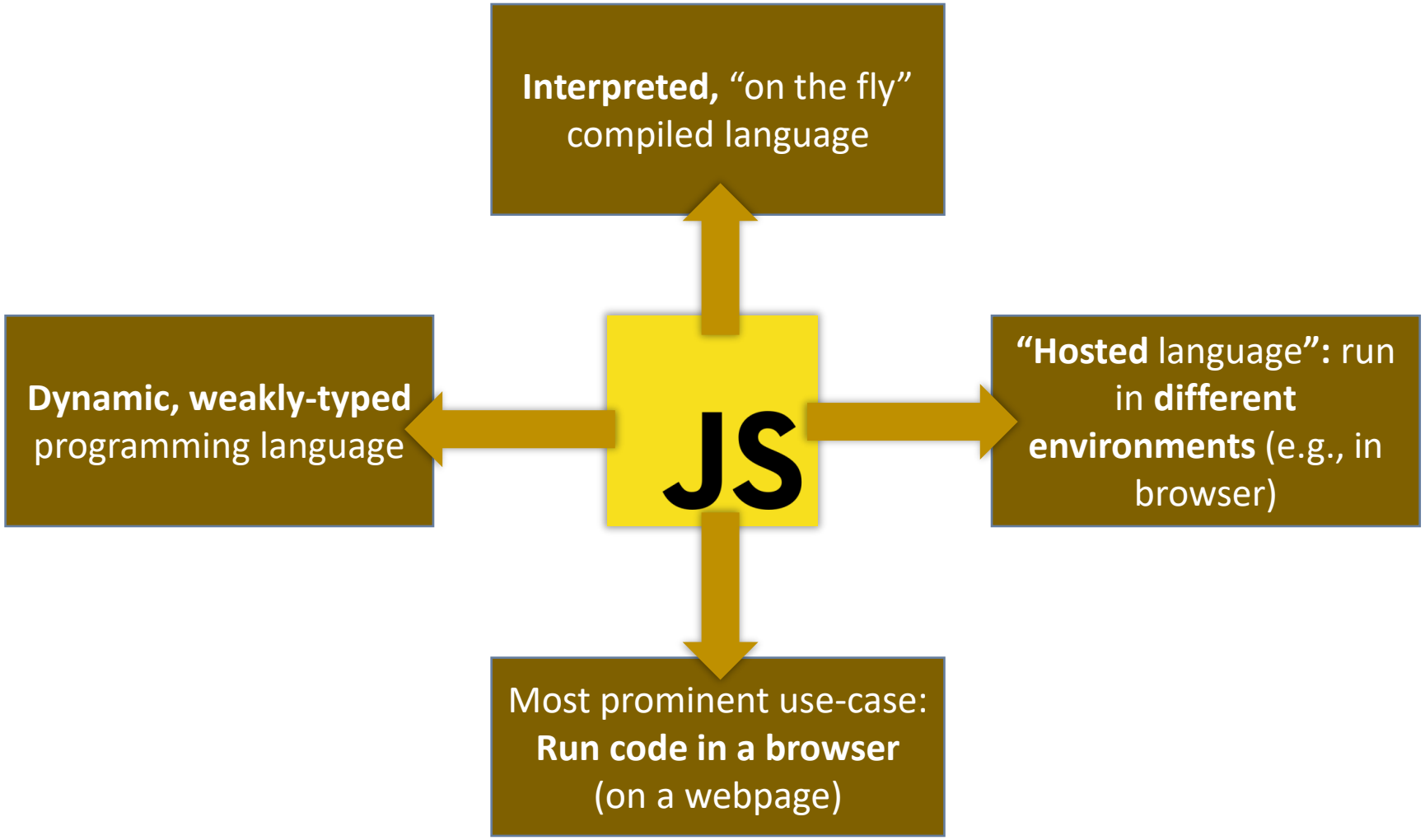
How do Webpages work?



Dynamic Webpages?

Let’s see an Example!

What is JavaScript?



variables

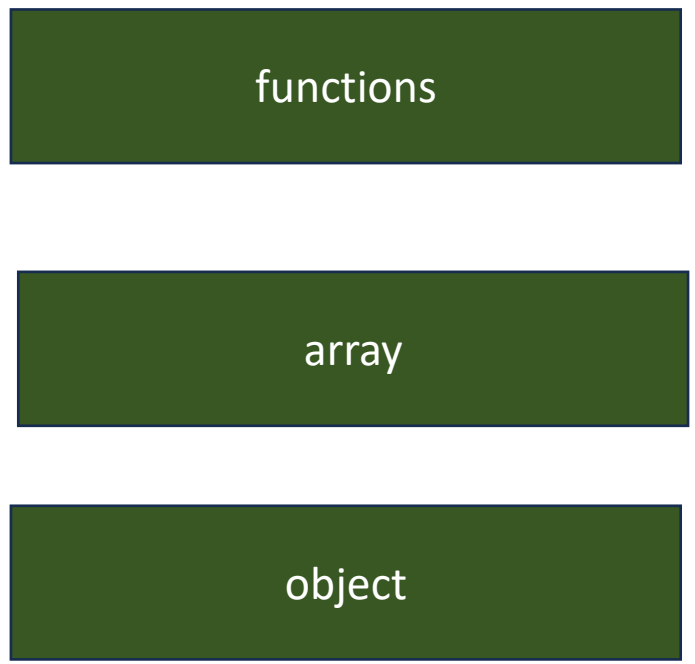
data types

Numbers	2, 5, 44.33	Important for calculations and code where you need to “work with a number”
Strings (Text)	‘Hi’, ‘Hello’	Important for outputting results, gathering input
Booleans	True/ false	Important for conditional code and situations where you only have 2 options
Objects	{ name: ‘NCET’, age: 22}	Important for grouped/ related data, helps you with organizing data
Arrays	[1,2,4]	Important for list data, unknown amounts of data

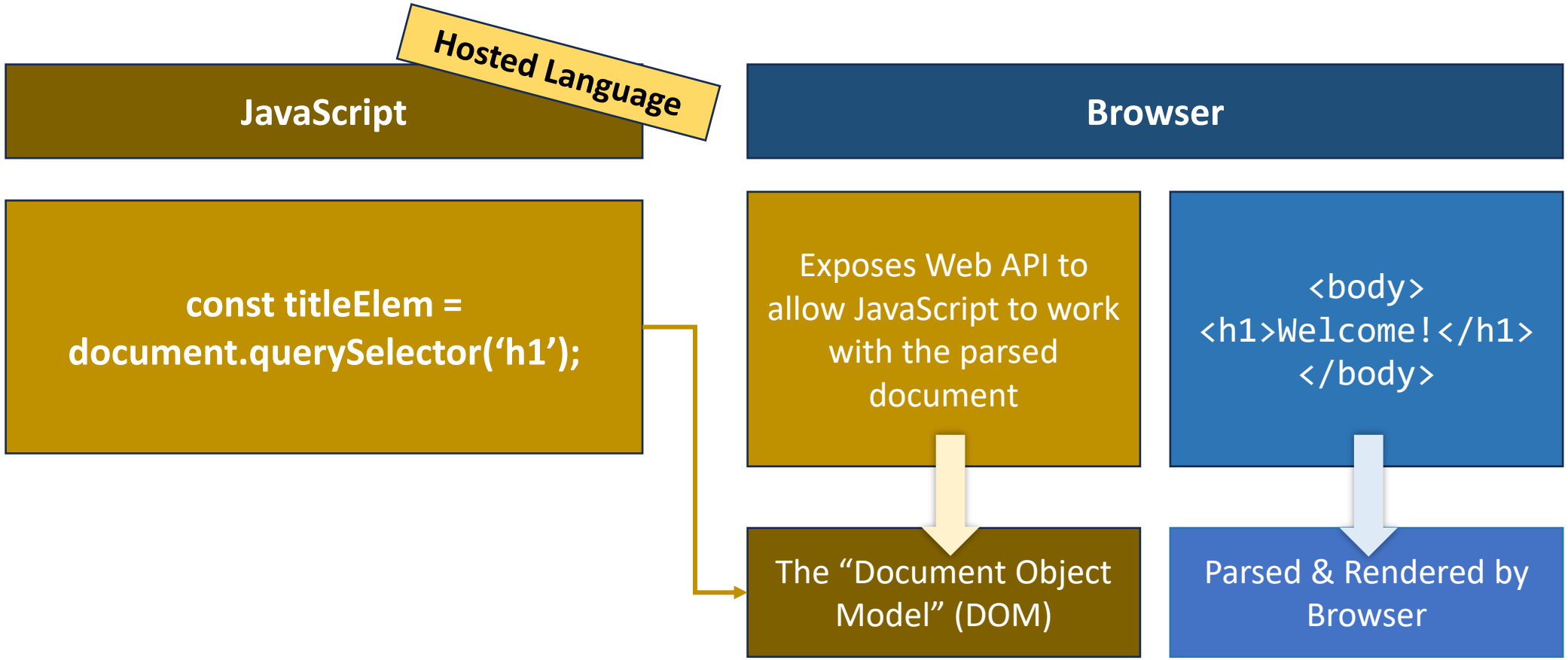
operators

+	Add two numbers
-	Subtract two numbers
*	Multiply two numbers
/	Divide two numbers
%	Divide two numbers, yield remainder
**	Exponentiation (e.g. 2 ** 3 = 8)

=	Assign value to variable
+=, -=, ..	Perform calculation and reassign result to variable
++, --	Increment / Decrement variable value + re-assign


functions
array
object

The Document Object Model (DOM)



document & window

document	window
Root DOM Node	The active Browser Window/ Tab
Provides access to element querying, DOM content etc.,	Acts as global storage for script, also process access to window specific properties and methods

Let’s see an Example!

Querying elements

querySelector(), getElementById()

querySelectorAll(), getElementByTagName(), …

Return single elements

Returns collections of elements (array-like object): NodeList

Different ways to querying element (by CSS selector, by ID)

Different ways to querying elements (by CSS selector, by tag name, by CSS Class)

Let’s see an Example!

Class & Object-oriented programming (OOP)

Events in JavaScript

Run code upon certain events

Exact Implementation Differs

Events typically transport data

e.g. Browser: addEventListener()

addEventListener('…', **event** =>..)

e.g. NodeJS: on()

on('…', **event** => …)

TypeScript

Typescript is a Superset of JavaScript

Which simply means, a wrapper or layer with more features.

What is TypeScript?

```
function add(a, b) {
  return a + b;
}

add("5", "3");
```

Runtime error!

Superset of JavaScript

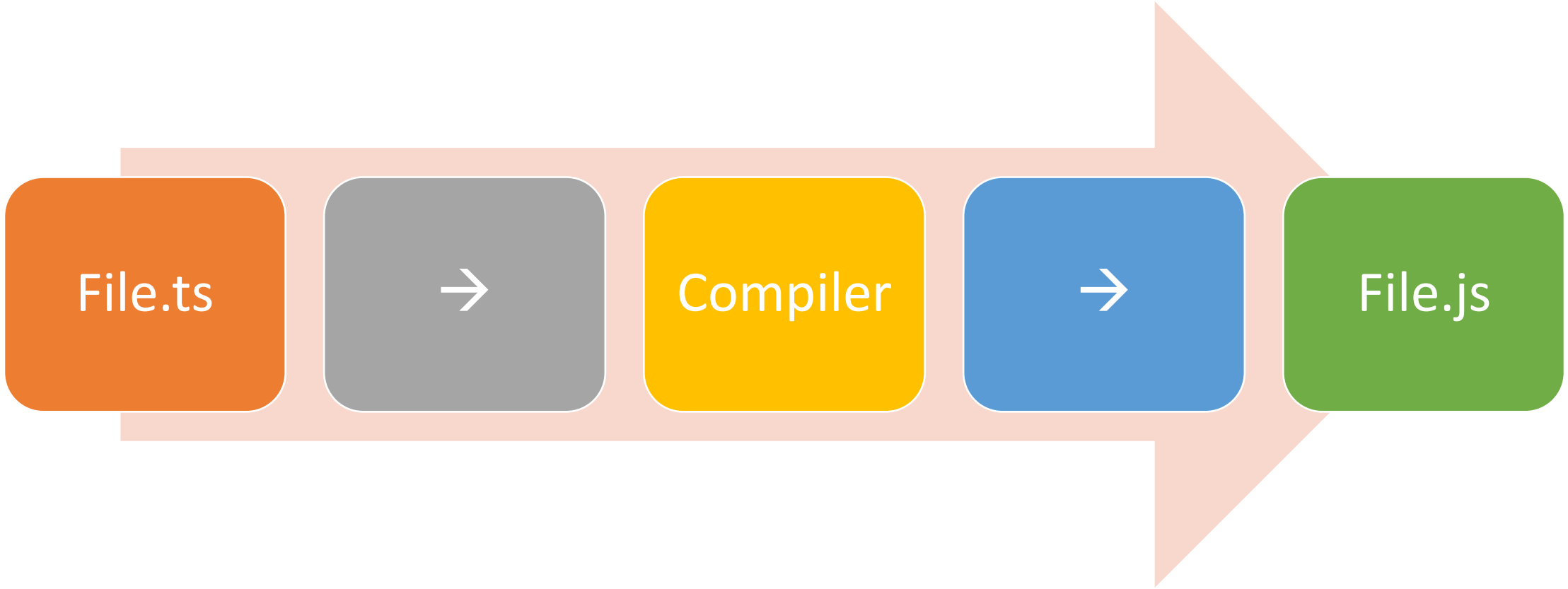
```
function add(a: number, b: number) {
  return a + b;
}

add("5", "3");
```

Compile error

- Adds static Types!
- Adds some new features
- Compiles next-gen JS to "old JS"

How it works?



Features

Types

Interfaces

Generics

Q & A