



Swift for WebAssembly

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Swift for Visual Studio Code

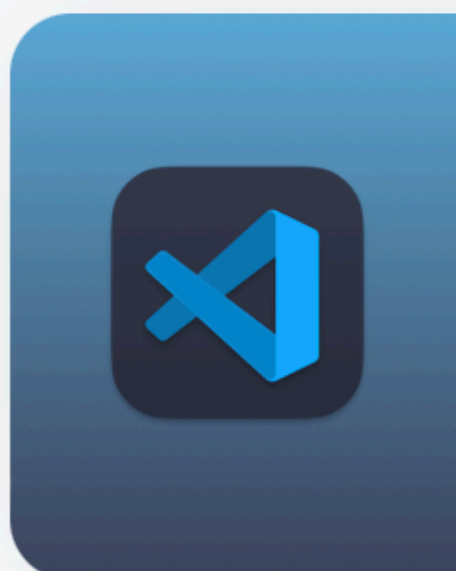
Highlight.js

FEATURED COURSE



Programming with Swift Fundamentals

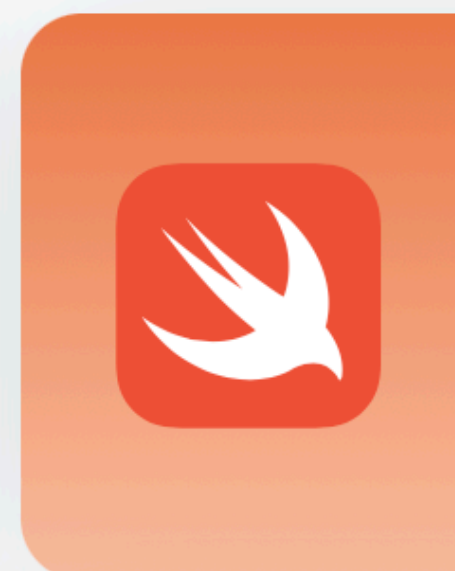
Latest posts



Swift for Visual Studio Code

Improving the developer experience of Swift on Linux and Windows

open source



Launching our first course

"Programming with Swift: Fundamentals" is our introductory programming course

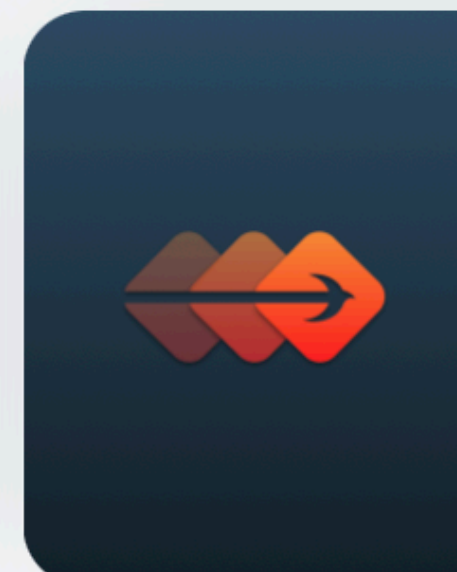
courses



Contributing to Highlight.js

Better syntax highlighting for Swift in websites and documentation

open source



ServerSide.swift 2018

Server-side web apps with Kitura and Stencil

conferences



PWS Academy

- Offer high-quality computer science courses
- Improve diversity and inclusion
- Introduce Swift as a teaching language in higher education
- Going forward, Swift needs better cross-platform support

pwsacademy.org



WEBASSEMBLY

What is WebAssembly?

WebAssembly (Wasm) is a binary instruction format for a stack-based virtual machine.

Wasm is designed as a portable compilation target for programming languages, enabling deployment on the web for client and server applications.

What is WebAssembly?

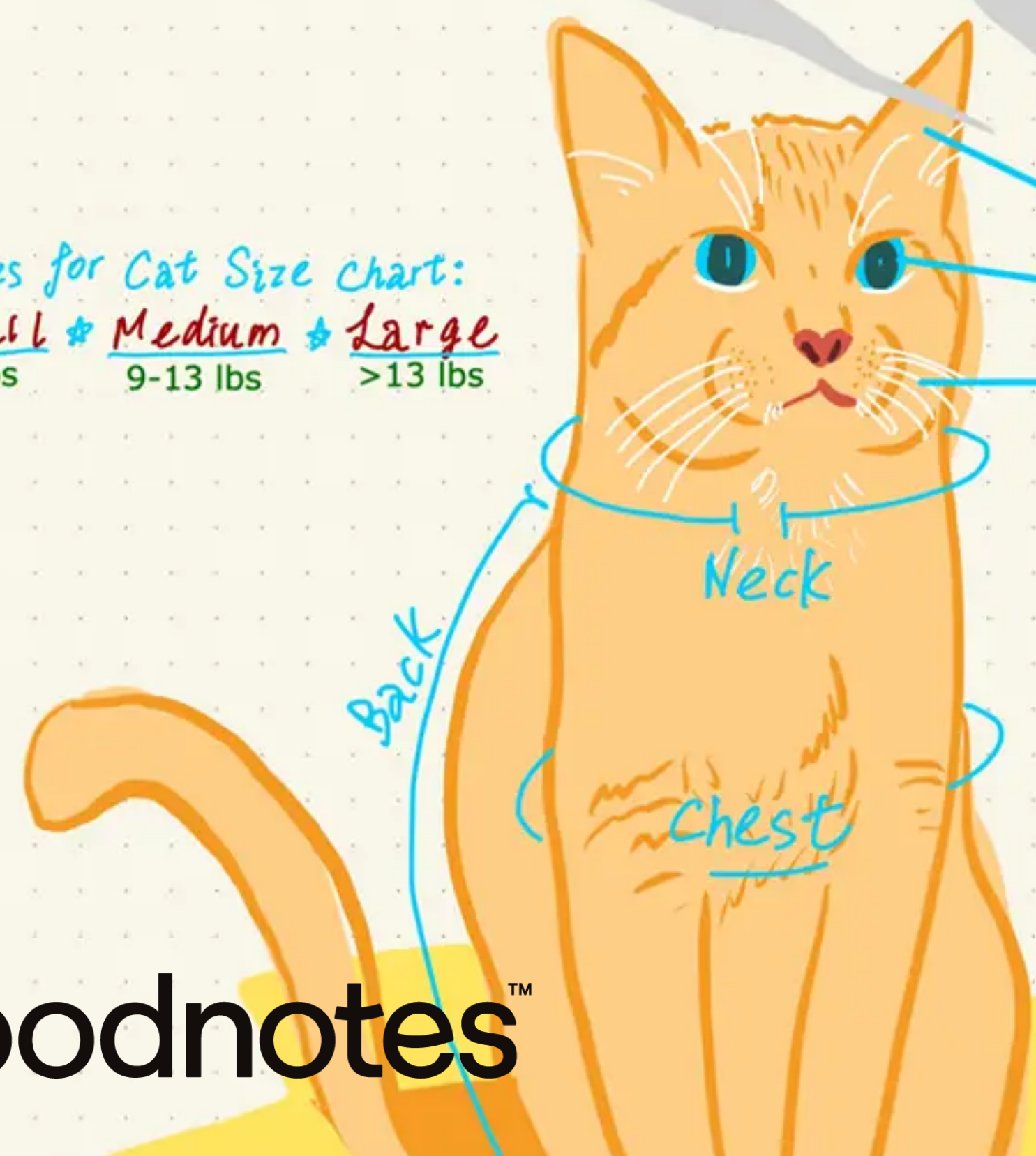
- Portable compilation target
- Lightweight, memory-safe, sandboxed execution environment
- Supported by C++, Rust, Swift, ...
- Requires a runtime

Applications

1. Run Swift in a browser

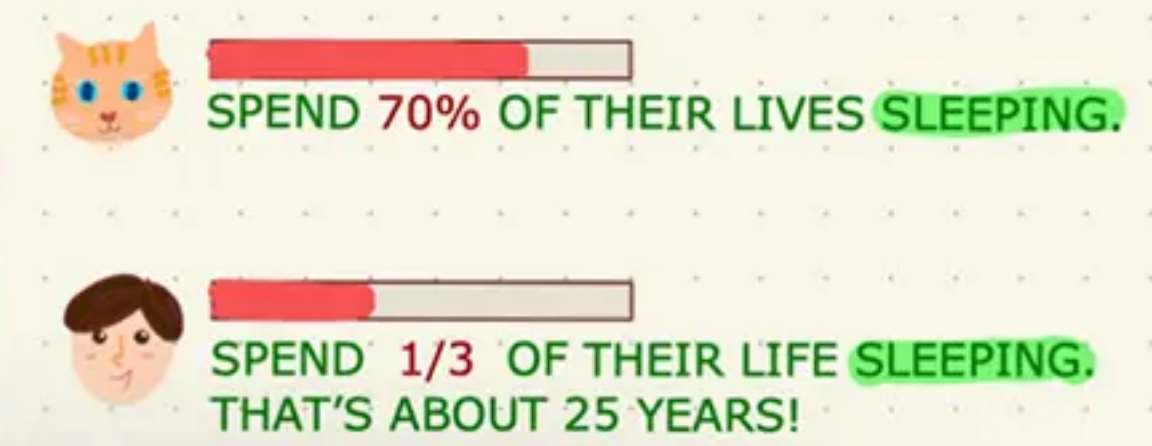
Cat FACTS

Clothes for Cat Size chart:
★ Small ★ Medium ★ Large
<9 lbs 9-13 lbs >13 lbs



Ears, Eyes & Whiskers

Your cat's expression will tell you how it really feels:



Comment #2

RC

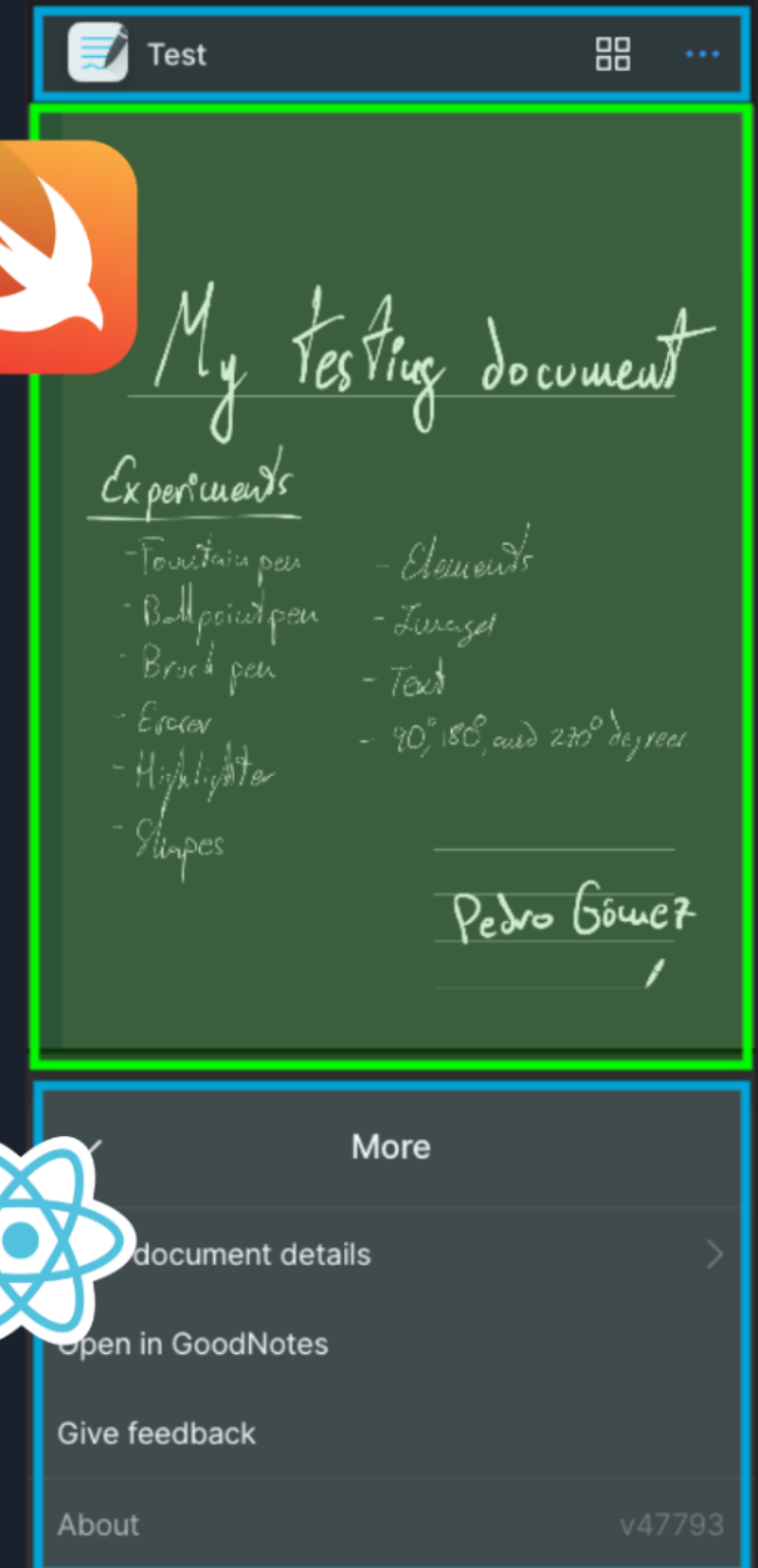
Jacob Walker
Yesterday

Thanks for sharing. 🐾
Relaxed and attentive looks are similar.

SW

Pavithran Ram
Today

A cat who is feeling good will have relaxed open eyes, ears facing forward, relaxed muzzle, and loose and curved whiskers.



<https://vimeo.com/751290710>

Applications

1. Run Swift in a browser
- 2. Run Swift on a server**

Build & Deploy Server Side Swift

Swift Cloud is the fastest way to build and deploy
server side Swift applications.

[Get Early Access](#)

```
01  import Compute
02
03  @main
04  struct App {
05
06      static func main() async throws {
07          try await onIncomingRequest(handler)
08      }
09
10      static func handler(
11          req: IncomingRequest,
12          res: OutgoingResponse
13      ) async throws {
14          try await res.status(.ok).send("Hello, Swift.")
15      }
16  }
```

<https://swift.cloud/>

Applications

1. Run Swift in a browser
2. Run Swift on a server
- 3. Load plug-ins**

Building Swift Macros with WebAssembly

Project size: 350 hours

Difficulty: Intermediate

Recommended skills

- Basic proficiency in Swift, C++
- Interest in compilers and WebAssembly

Description

Swift [macros](#) are built as host programs that make use of the [swift-syntax](#) package to process Swift syntax and produce new syntax. One of the downsides of this approach is that the build process for each macro can take a significant amount of time, and pre-building macro binaries is complicated by the fact that the binaries need to be built for multiple host platforms (e.g., Linux, Windows, and macOS) and architectures (e.g., x86 and ARM). Moreover, macros are aggressively sandboxed to prevent errors in macros from affecting the Swift compiler itself.

<https://www.swift.org/gsoc2024>



SwiftWasm

swiftwasm.org

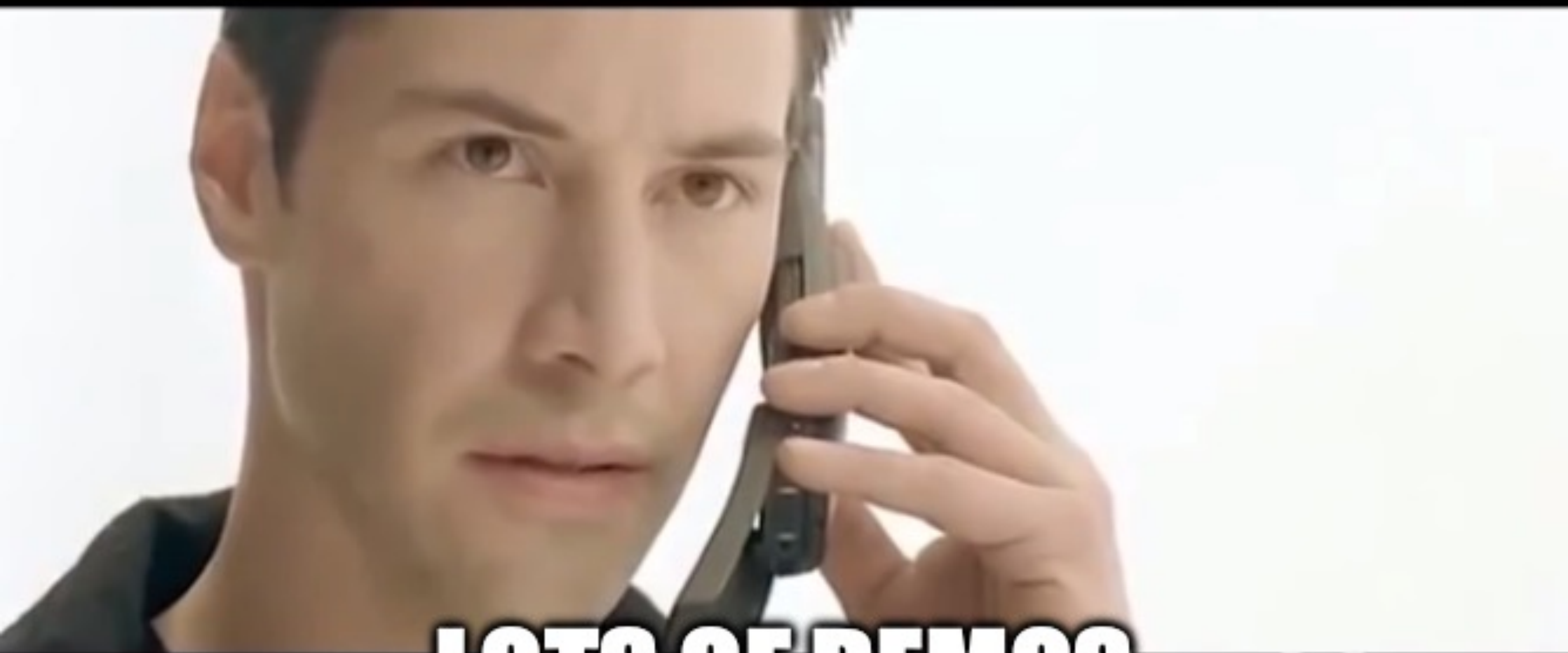
SwiftWasm

- **Toolchain**
 - Compile Swift to WebAssembly
- **Carton**
 - Build web apps with Swift
- **JavaScriptKit**
 - Interact with JavaScript
- **WasmKit**
 - Runtime written in Swift

Enough slides
We need ...



DEMOS



LOTS OF DEMOS

Final thoughts

- **Pros**

- Great potential for Swift developers
- Worth considering — can be production-ready

- **Cons**

- WebAssembly 1.0 is rather limited
- Large binaries

Coming soon

- Swift SDKs
- WASI Preview 2
 - Component Model
- Embedded mode

Q & A



Demos and useful links

<http://github.com/pwsacademy/swiftwasm-examples/>



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