

Mastering Swift for Scripting and Tooling

Natan Rolnik @ SwiftConnection 24





Hi, I'm Natan

iOS @ monday.com

- 3x dad 👪 👪 👪
- iPhone OS 3, Objective C was my 1st language ❤️
- Passion for beautiful UI and animations
- Interested in web, server and tooling technologies
- I **love** coding in Swift 🦅
- SwiftToolkit.dev



@natanrolnik



What is Tooling?

What is Tooling?

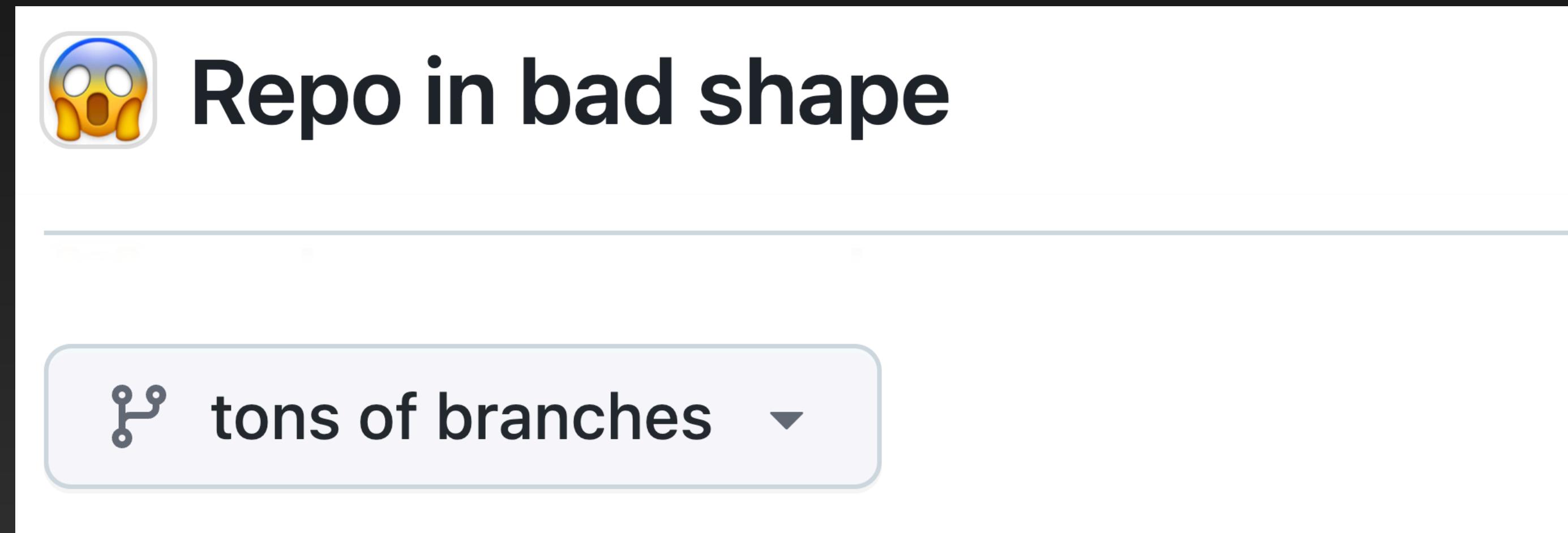
*The use of **specialized** software programs that **help developers** in various tasks. These tools **improve efficiency, collaboration, and the overall development process.***

How I Got Into It?

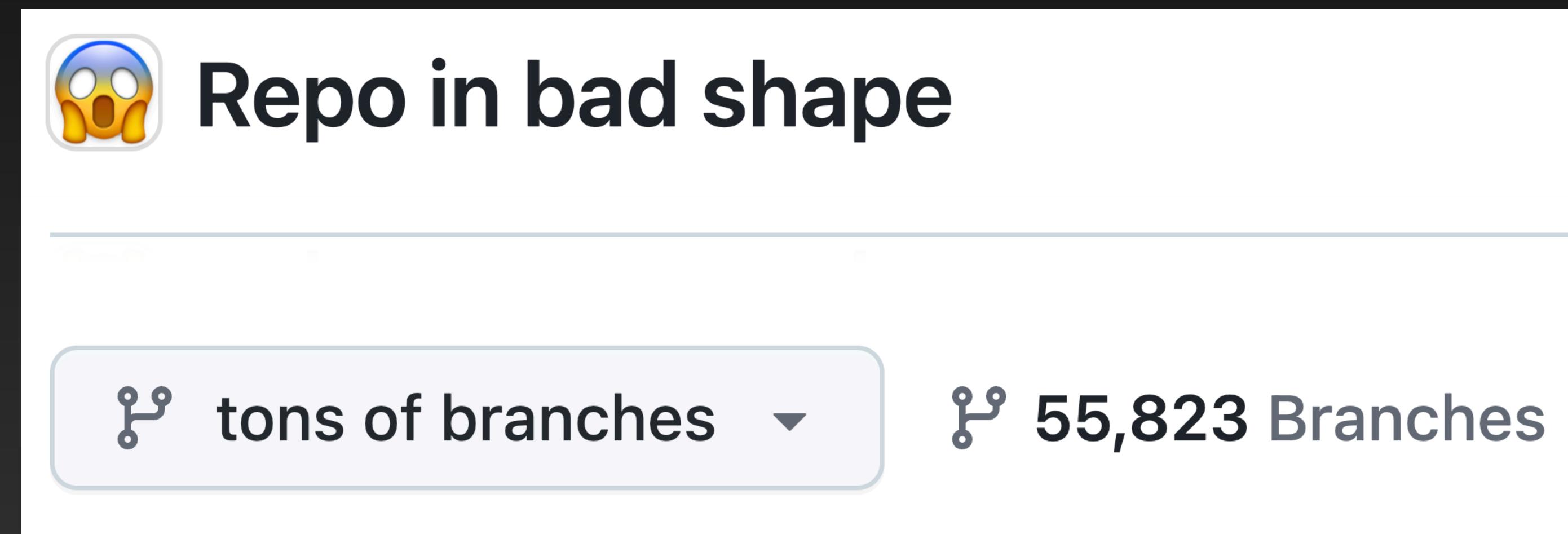


Repo in bad shape

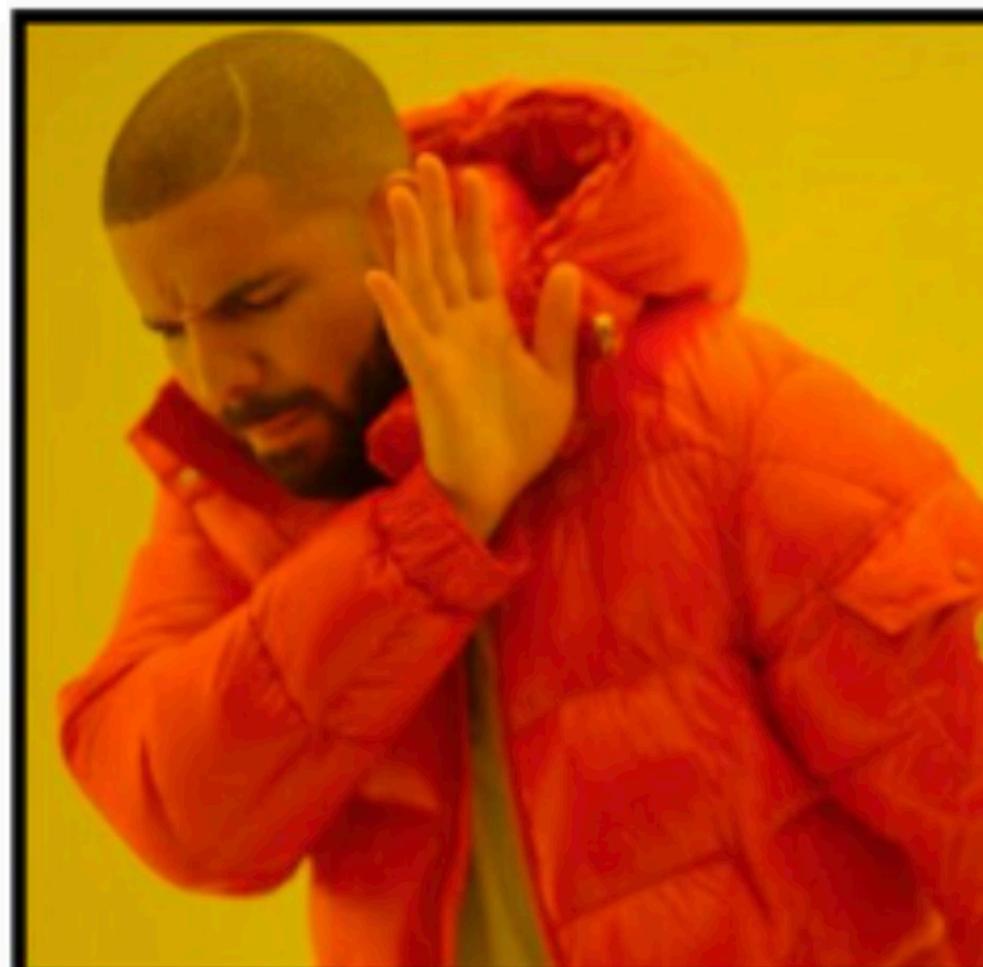
How I Got Into It?



How I Got Into It?



How I Got Into It?



**DRAWING JSON
AS LISTS FOR
ANOTHER YEAR**



How I Got Into It?



**DRAWING JSON
AS LISTS FOR
ANOTHER YEAR**



**LEARNING NEW
AREAS AND
EMPOWERING MY
TEAM**

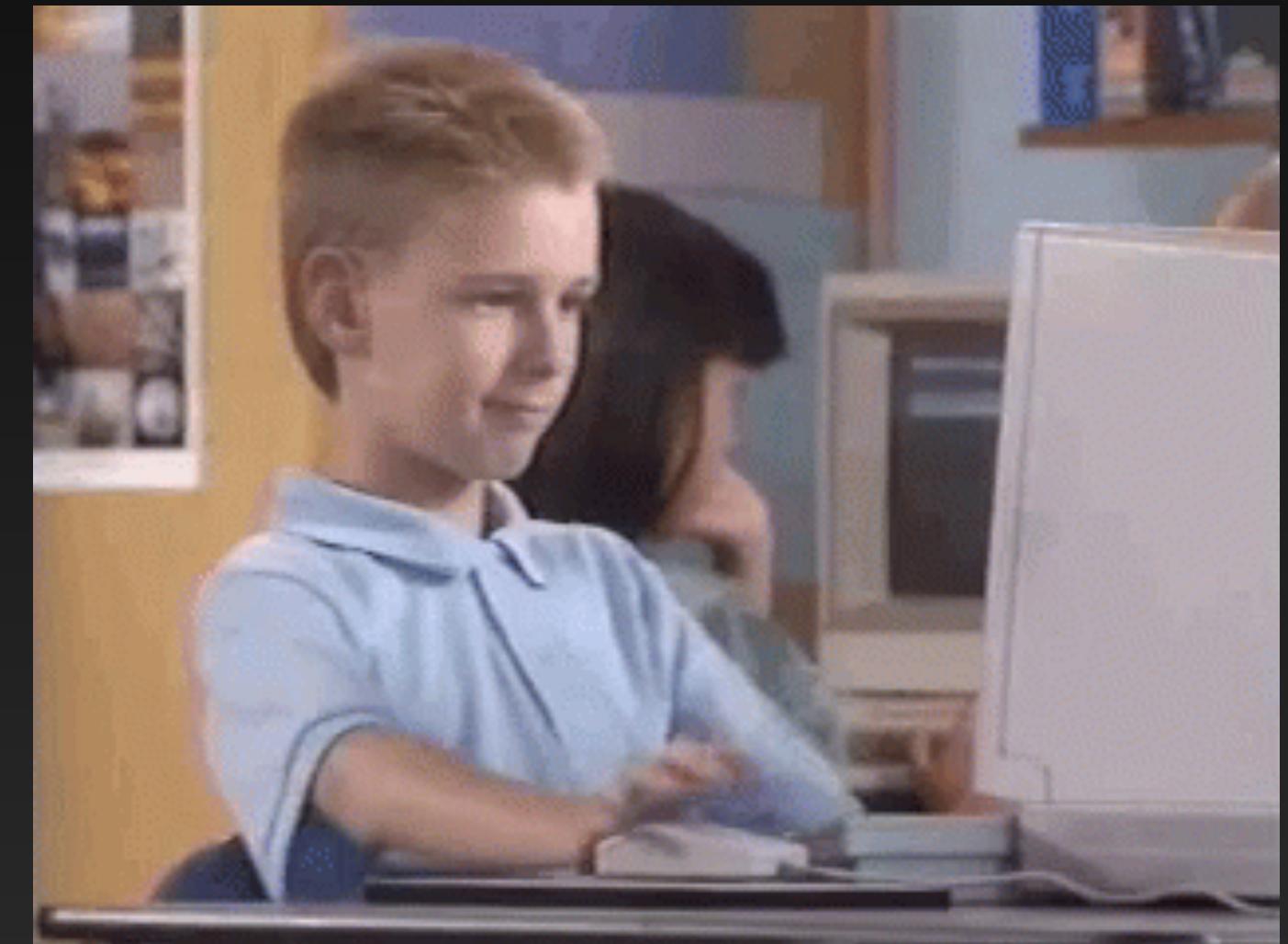
Goals



Learn different
approaches when
building tools



Meet common
building blocks
and tools



Inspire & have **fun!**

Agenda



Agenda



Why Swift for Scripting?

Agenda



We'll start with a short script...

Agenda



We'll learn how to make it a bit more complex

Agenda



We'll build a code generation tool with
Stencil and the Swift Argument Parser

Agenda



Agenda



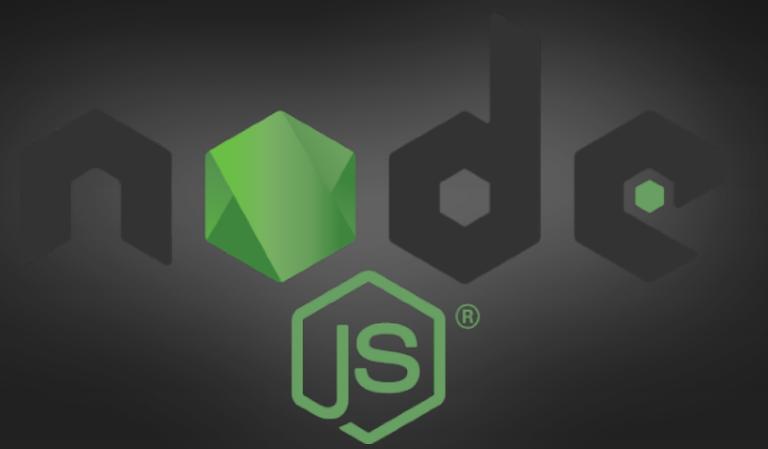
Agenda



Warmup Questions

Why Swift for Scripting & Tooling?

Only Swift?



Only Swift?



Only Swift?



Only Swift?



Advantages

Memory &
Type Safety

Foundation

Property
Wrappers

async
await

SPM
Plugins

Macros

It's Swift ❤️

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Macros

MyScript.swift

```
import AppKit  
import SwiftUI
```

Tool.app

```
import SwiftUI
```

It's Swift ❤️

It feels at home

Advantages

Memory &
Type Safety

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It's Swift ❤️

MyScript.swift

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Tool.app

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It feels at home



Code Sharing &
Ecosystem

The Great Change

Objective-C

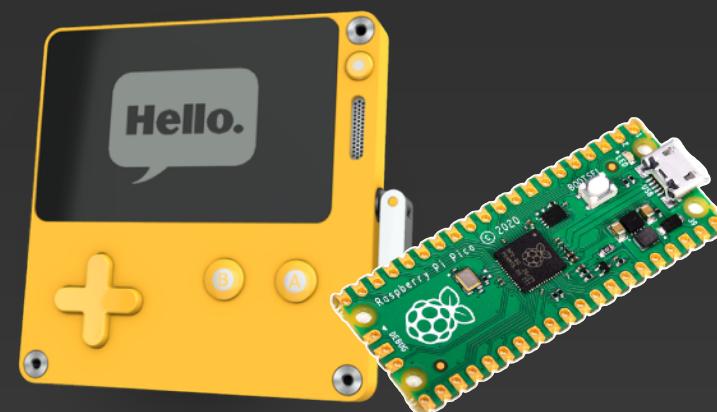
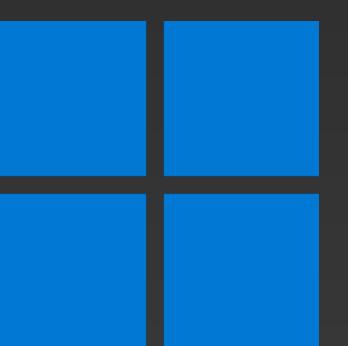
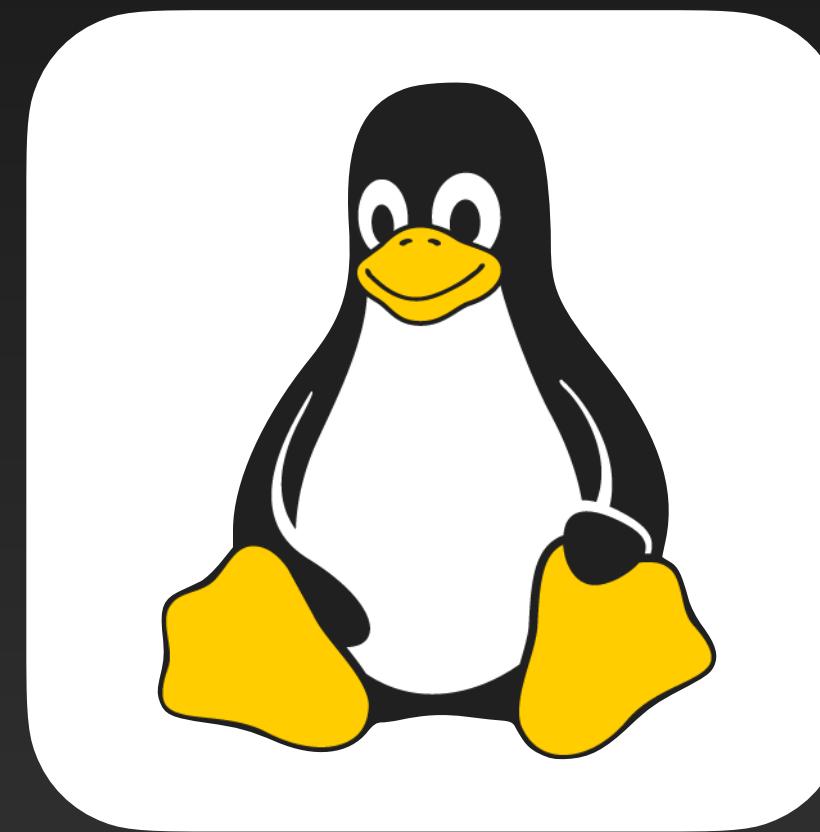


The Great Change

Objective-C



Swift



1: Scripting

What We'll Build?



Swift Connection 24

What We'll Build?



Swift Connection 24



Feature Branch

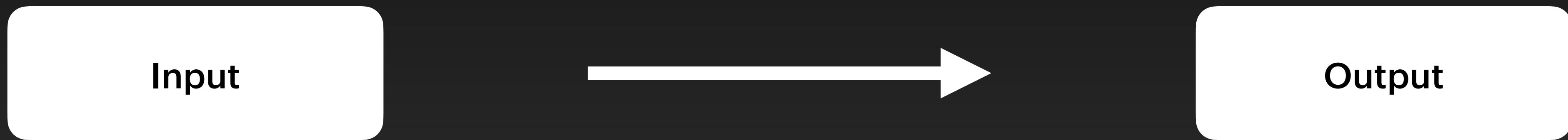
Swift Connection 24



2: A CLI Tool

What We'll Build?

Analytic Events



What We'll Build?

Analytic Events



What We'll Build?

Analytic Events

Event Name	Description	Fields
StartedPlayback	Started watching a talk video	talkId
...
...

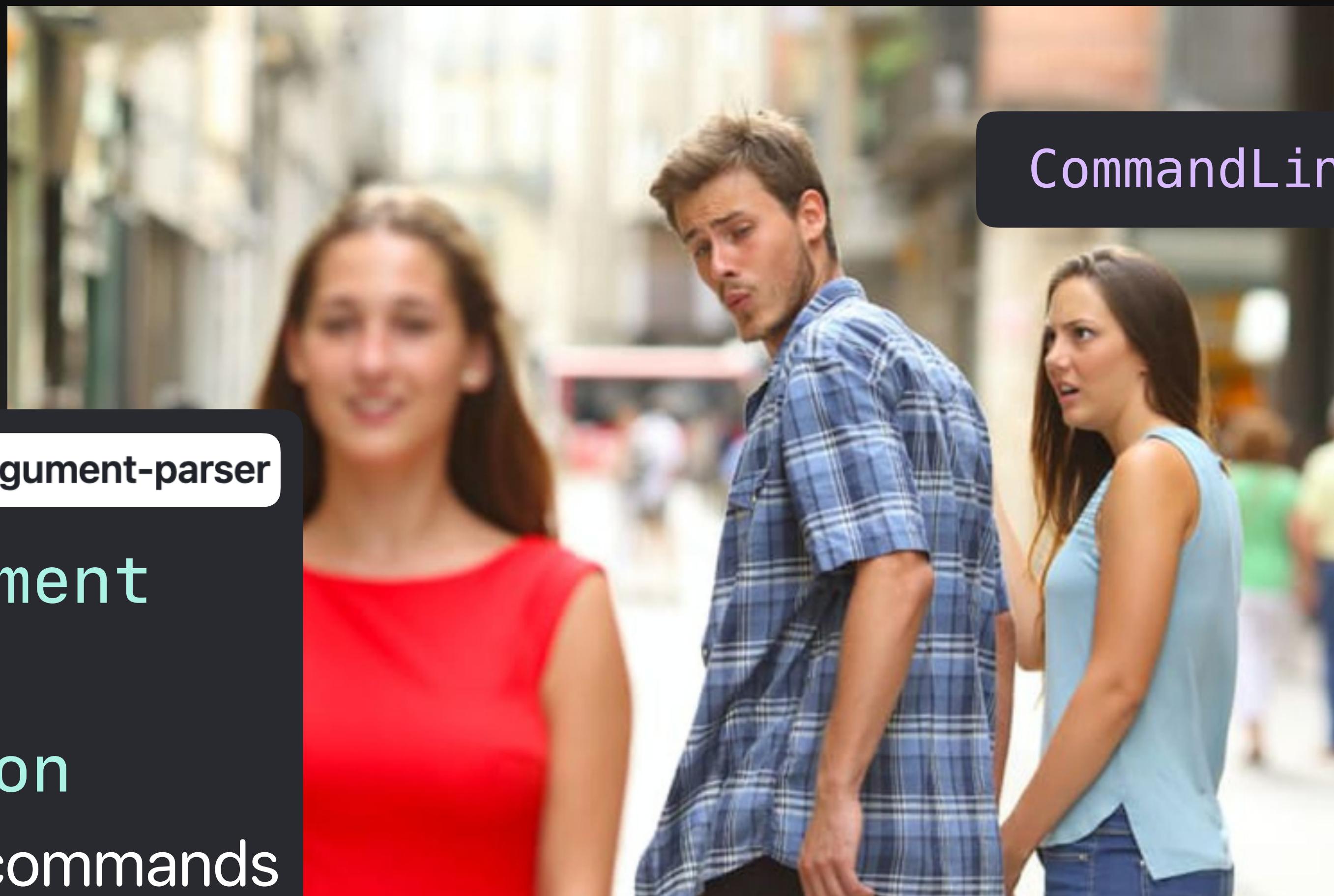


```
/// Started watching a talk video
struct StartedPlaybackEvent {
    let name = "StartedPlayback"
    let talkId: String
    var data: [String: String] {
        "talkId": talkId,
    }
}
```

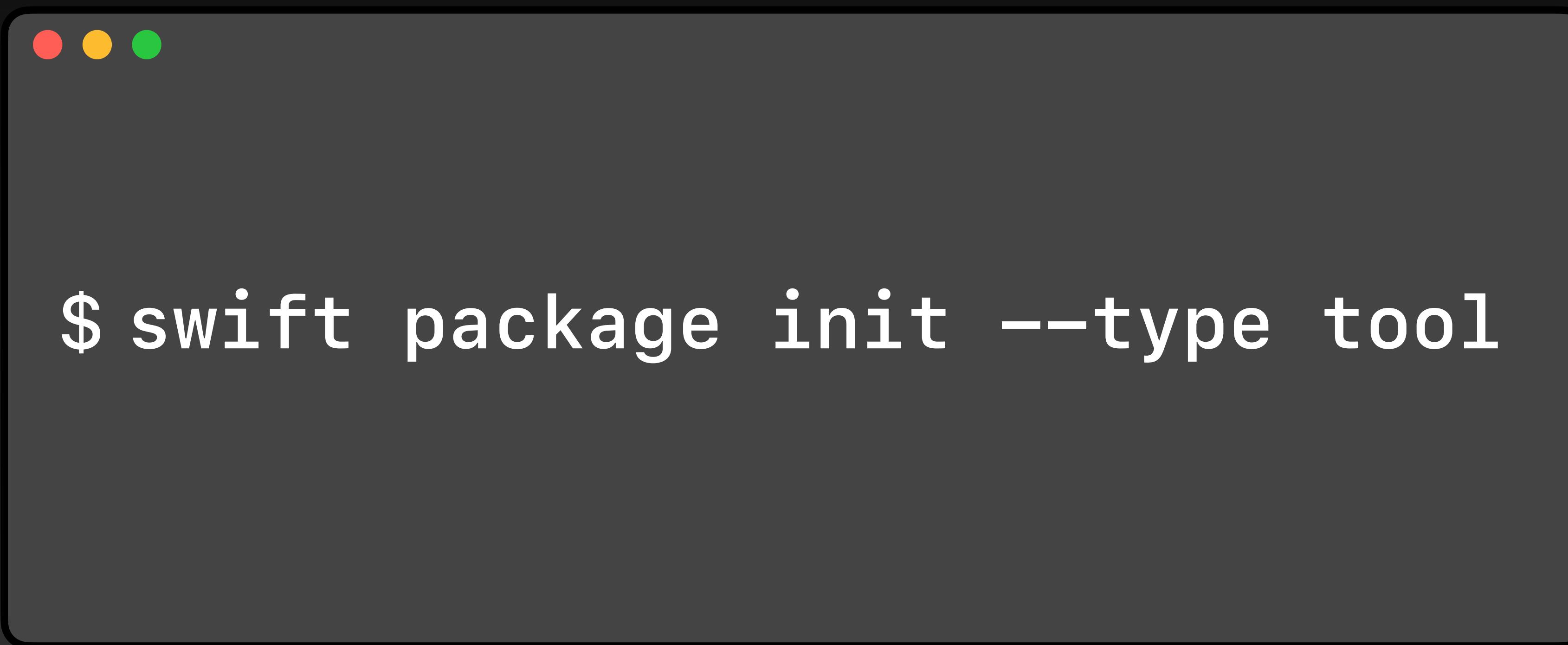
Swift Argument Parser

CommandLine.arguments

Swift Argument Parser



Swift Argument Parser



Stencil

*Stencil is a simple and powerful
template language for Swift.*

Stencil

There are {{ articles.count }} articles.

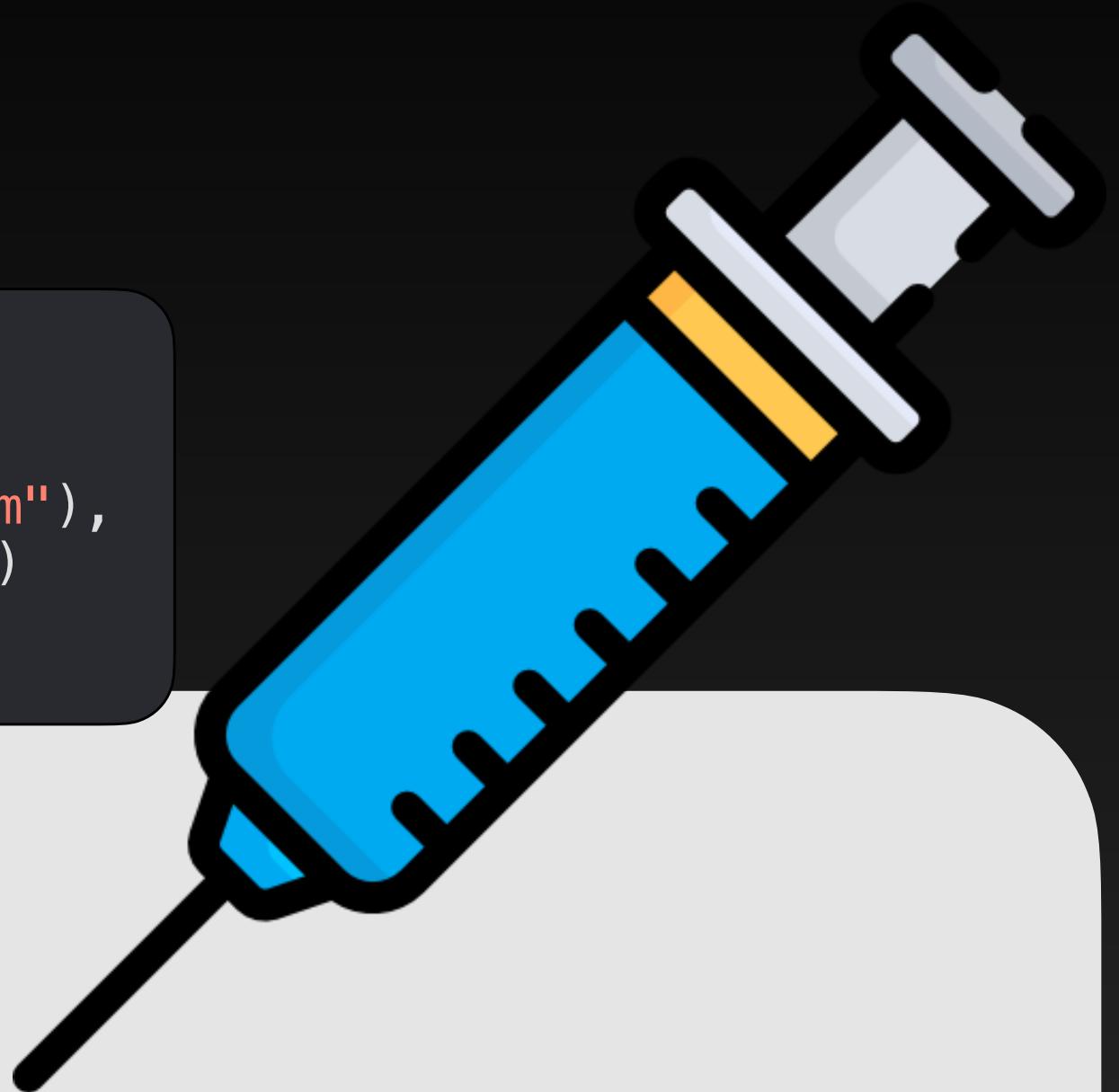
```
<ul>
  {% for article in articles %}
    <li>{{ article.title }} by {{ article.author }}</li>
  {% endfor %}
</ul>
```

Stencil

```
let articles = [  
    Article(title: "Debugging Soccer", author: "Rafa"),  
    Article(title: "The Algorithm Adventure", author: "Liam"),  
    Article(title: "Baby Steps in Swift", author: "Ariela")  
]
```

There are {{ articles.count }} articles.

```
<ul>  
    {% for article in articles %}  
        <li>{{ article.title }} by {{ article.author }}</li>  
    {% endfor %}  
</ul>
```



Stencil

There are 3 articles.

```
<ul>
  <li>Debugging Soccer by Rafa</li>
  <li>The Algorithm Adventure by Liam</li>
  <li>Swift for Babies by Ariela</li>
</ul>
```



Running on GitHub Actions

.github/workflows/generate-events.yml

Running on GitHub Actions

```
1  name: Generate Analytic Events
2
3  on:
4    push:
5      branches: [ main ]
6      paths:
7        - 'Events.md'
8    workflow_dispatch:
```

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10  jobs:
11    generate:
12      runs-on: ubuntu-latest
13
14    permissions:
15      # Give the default GITHUB_TOKEN write permission to commit and push the
16      # added or changed files to the repository.
17    contents: write
18
```

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19  steps:
20
21  - name: Get swift version # GH Linux images contain the latest stable Swift version
22    run: swift --version # Swift 5.10.0
23
24  - name: Check out code
25    uses: actions/checkout@v2
26
27  - name: Run Command
28    run: swift run AnalyticsGenerator --input Events.md
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```

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8          workflow_dispatch:
9
10     jobs:
11         generate:
12             runs-on: ubuntu-latest
13
14
15     # Commit all changed files back to the repository
16     - name: Push changes
17         uses: stefanzweifel/git-auto-commit-action@v5
18         with:
19             commit_message: Generate analytic events
20
21
22     - name: Run Swift
23         uses: actions/checkout@v2
24
25     - name: Run Command
26         run: swift run AnalyticsGenerator --input Events.md
27
28
```

.github/workflows/generate-events.yml

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```

.github/workflows/generate-events.yml

Running on GitHub Actions

← Generate Analytic Events

✓ **Update Events.md #2**

Summary

Triggered via push 5 months ago

natanrolnik pushed ~ 317b546 **main**

Status: **Success** | Total duration: **1m 14s** | Billable time: **2m** | Artifacts: -

Jobs:

- generate (✓)

Run details

Usage

Workflow file

generate-analytic-events.yml

on: push

generate 1m 3s

This screenshot shows a GitHub Actions run summary for a workflow named 'Update Events.md #2'. The run was triggered via a push 5 months ago by user 'natanrolnik' to branch 'main'. The status is 'Success' with a total duration of 1m 14s and billable time of 2m. The 'generate' job is listed as completed with a green checkmark. The workflow file 'generate-analytic-events.yml' is shown, containing a single job step 'generate' which took 1m 3s to run.

Running on GitHub Actions

The screenshot shows a GitHub Actions run details page for a workflow named "Update Events.md #2". The left sidebar includes links for "Generate Analytic Events", "Summary", "Jobs", "generate", "Run details", "Usage", and "Workflow file". The main area displays the "generate" job, which succeeded on April 18 in 1m 3s. The job log shows the following steps:

- > Set up job
- > Get swift version
- > Check out code
- > Run Command
- > Push changes
- > Post Check out code
- > Complete job

Running on GitHub Actions

Generate analytic events

main

 natanrolnik authored and **github-actions[bot]** committed on Apr 18

Showing 1 changed file with 11 additions and 0 deletions.

11 GeneratedEvents.swift

```
@@ -38,4 +38,15 @@ struct ReachedCheckoutEvent {  
    38     38    }  
    39     39    }  
    40     40  
    41 + /// User purchased tickets, yay!  
    42 + struct PurchasedTicketsEvent {  
    43 +     let name = "PurchasedTickets"  
    44 +  
    45 +     let totalAmount: String  
    46 +  
    47 +     var data: [String: String] {  
    48 +         "totalAmount": totalAmount,  
    49 +     }  
    50 + }  
    51 +  
41      52
```

Wrap Up

Wrap Up

**Swift is not a silver bullet.
But it might be the best choice
for your team**

Wrap Up

Go build something!

Wrap Up

The Argument Parser is your
friend

Wrap Up

Leverage the existing
ecosystem

Explore Further

- Sample Code
 - <https://github.com/natanrolnik/SwiftConnection24>
- Projects used or mentioned in this talk
 - Swift Argument Parser, Stencil
 - SwiftTUI (for the Terminal, not SwiftUI 😊)
 - Path.swift, PathKit



Explore Further

- Content on tooling:
 - [SwiftToolkit.dev](#)
 - [PolPiella.dev](#)
- Projects Worth Mentioning
 - [swift sh](#)
 - [Tuist, XcodeProj](#)
 - Run sub-processes with: ShellOut, Command
 - [XcodeGen](#)
 - [SwiftGen](#)
 - [Swift Tools Support Core](#) (! Deprecated, but interesting)
 - [SwiftCloud](#)

Hope You Enjoyed!

🇫🇷 Merci beaucoup 🙏

@natanrolnik

Improving Times on GitHub Actions

actions/cache@v3



Precompile
binaries

swift build -c release