

PLAY

---:---

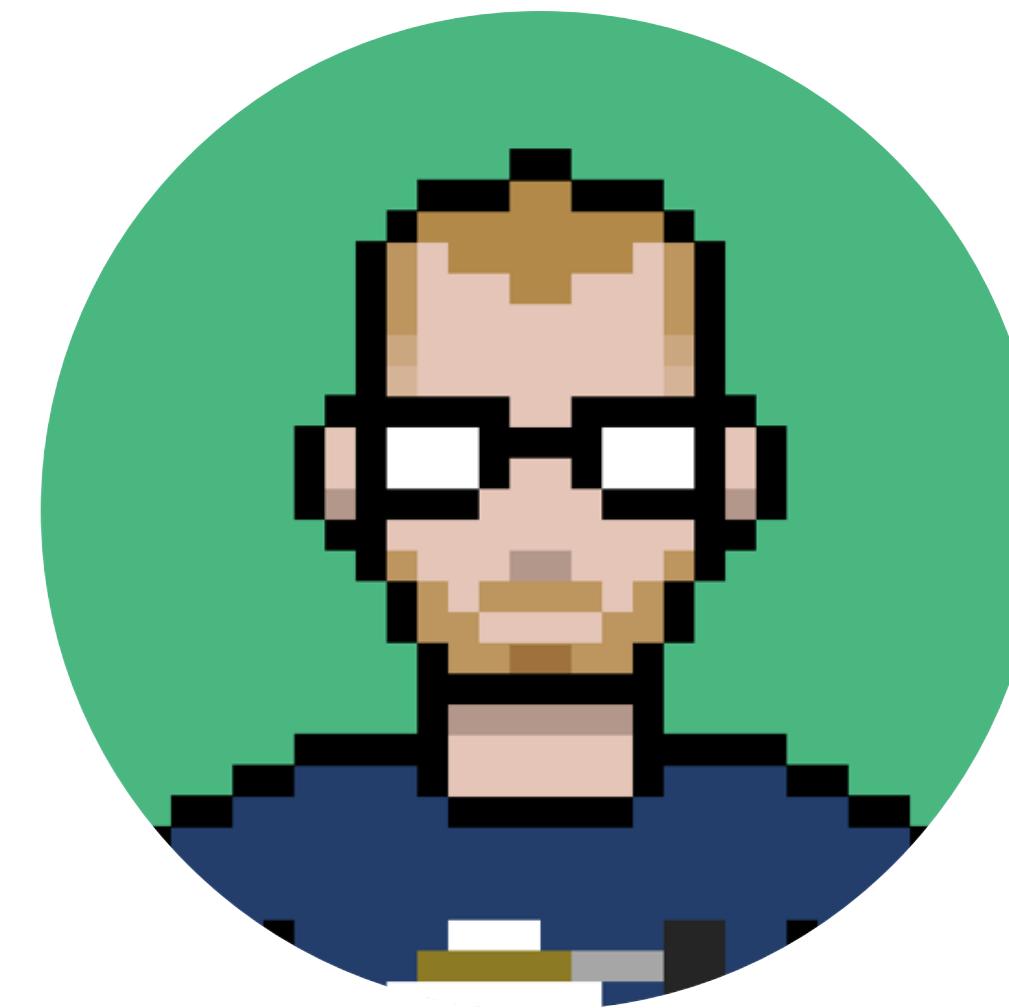
TAPE

# WARNING

The following talk contains references to religion. It might be inappropriate for some viewers. If you are sensitive to the topic, please attend the talk with both eyes and ears closed. Thank you.

TV ►

LP ◀



# MATTEO & KONSTANTIN

Co-Founders @ Shiny Frog

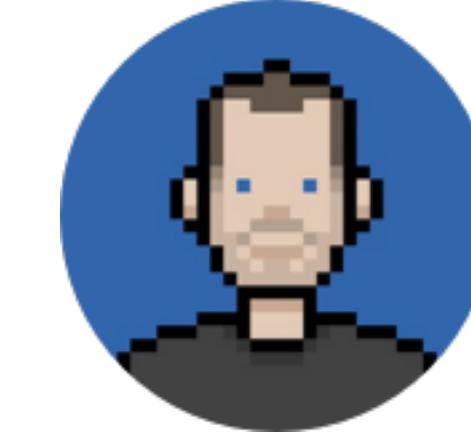
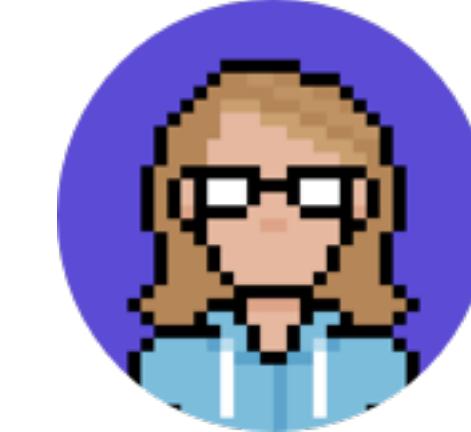
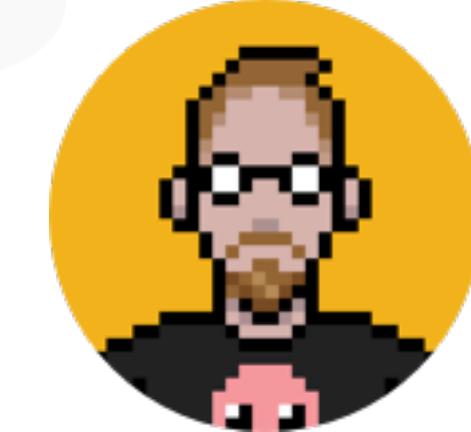
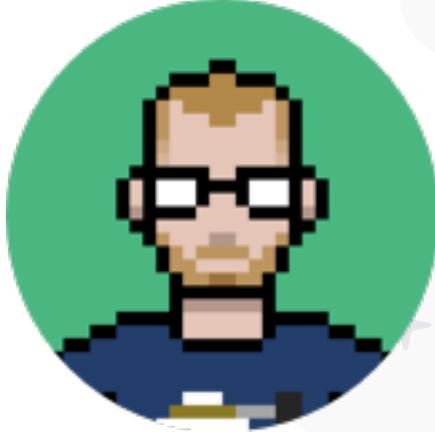


# SHINY FROG

We make  Apps!

# SHINY FROG

We make  Apps!



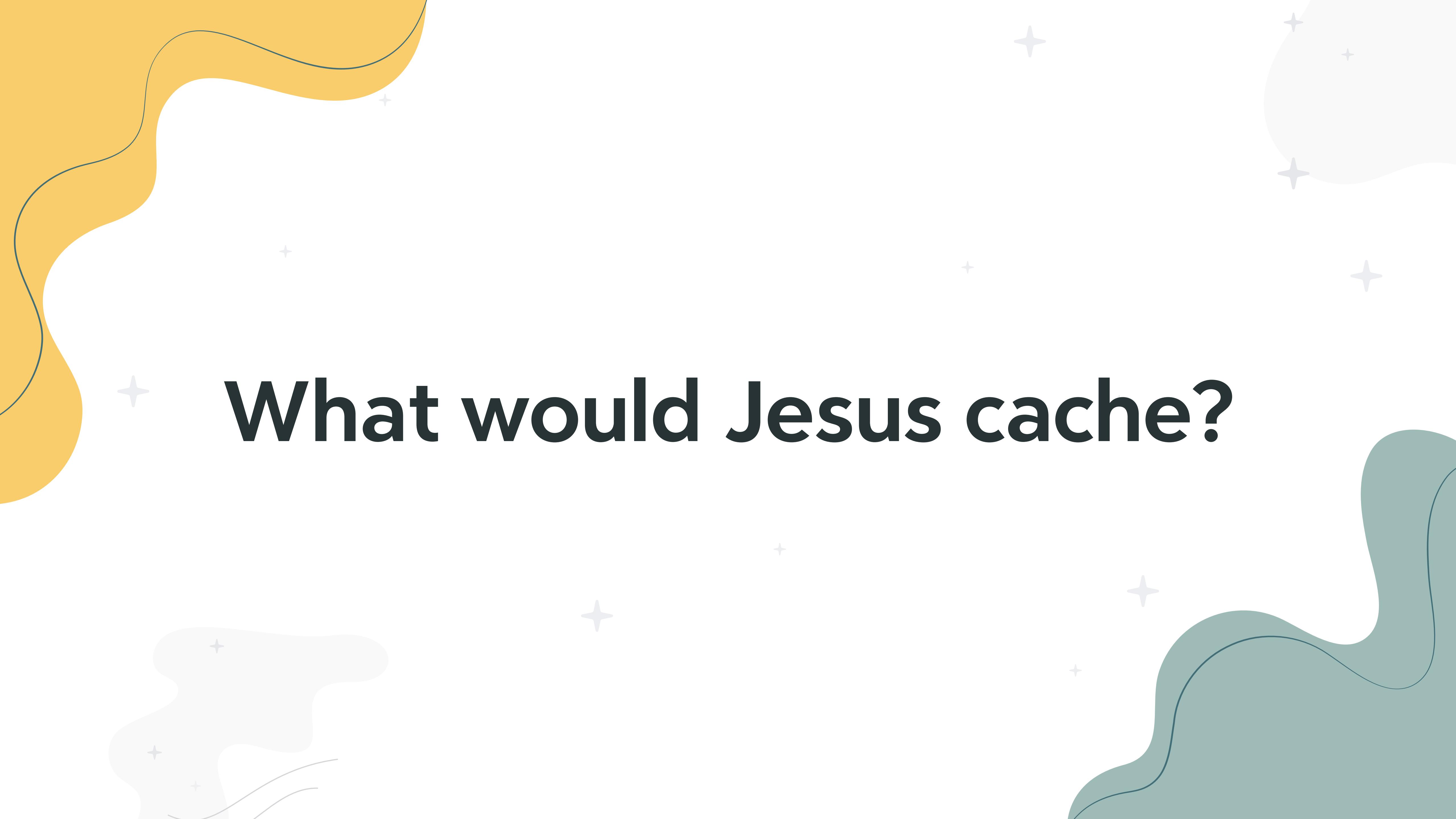


# MAKERS OF BEAR

Markdown note taking app

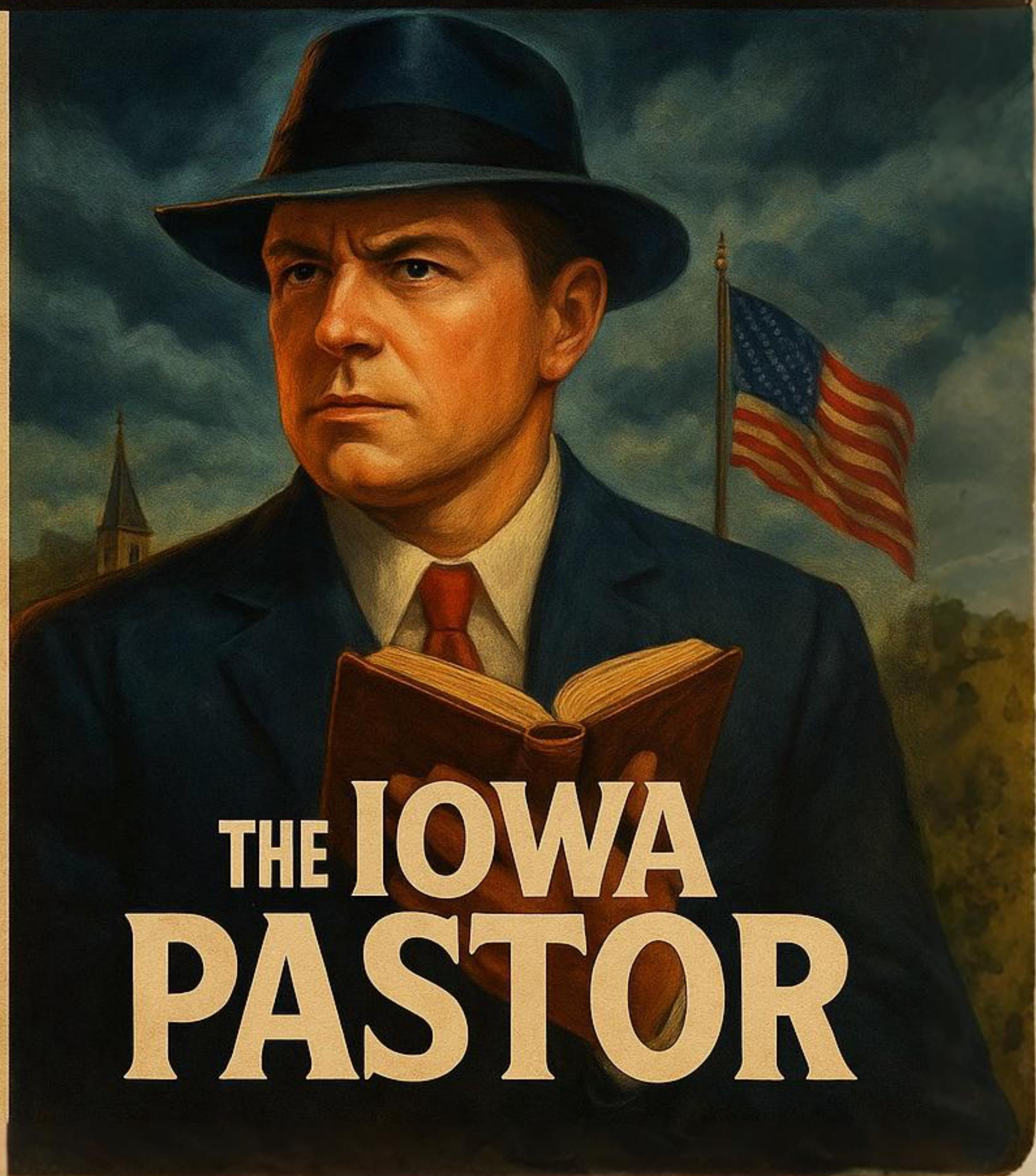
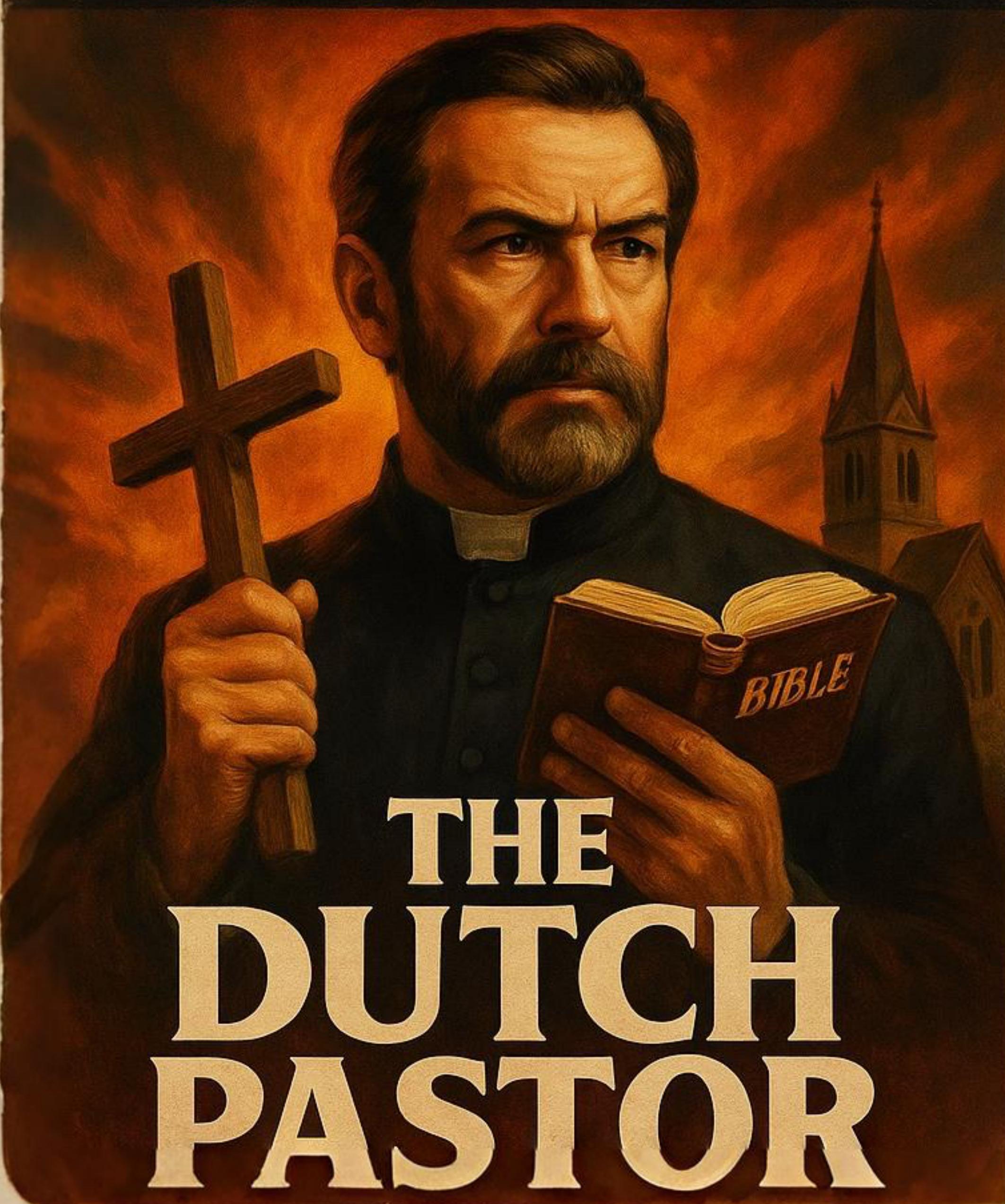
# The Sacred Secret Behind Our App's Speed

# Faith-driven development



# **What would Jesus cache?**

**ACTION-PACKED DOUBLE FEATURE!**



# THE BEGINNING

# 2013

A young lad, full of hope



# A Note Taking App





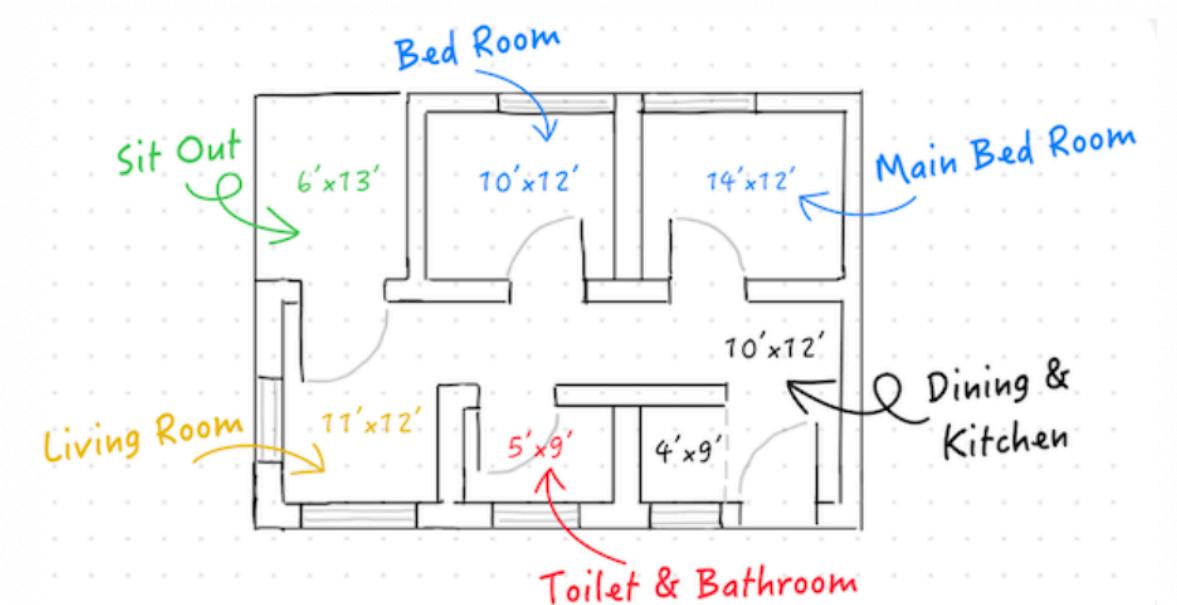
**Four months, tops.**

# Anyway... *three years later*

Project: #home renovation 

The goal is to create a more functional, comfortable and aesthetically pleasing living space for the family. The current layout feels cramped and the design is super outdated.

### Floor plan



**Renovation Progress Notes**  
Met with the contractors today to finalize the timeline and bud...  
23 hours ago

**Budget**  
Category Estimated Cost Actual Cost Notes Foundations \$15,0...  
23 hours ago

**Contractor details**  
Name: D&L Legend Builders  
Address: 128 Maple Avenue, Ri...  
[Contractor\\_Agreements.pdf](#)  
23 hours ago

**Bathroom shopping list**  
Ceramic tiles shower head new mirror lighting hooks faucet set...  
23 hours ago

### Construction notes

- FOUNDATIONS <sup>1</sup> 
- FRAMING 
- ROOFING
  - Incorporate **skylights** or roof windows
  - Use metal or durable shingles. Check **shopping list**
  - Add **roof vents** and **insulation**

# CHAPTER ONE



# THE DUTCH PASTOR

# **Several seconds to launch**

# DENIAL



# The man, the legend

The use case of a living legend

**“For my study, I create a new note for each paragraph in the Bible, and I tag it with the characters and location of that paragraph, so I can reference it later.”**

**The Dutch Pastor**

**90k**

**Notes**

**12k**

**Tags**



# Revelation

- He's a madman!
- A niche case.
- It's THE niche case.
- Something we could safely ignore.

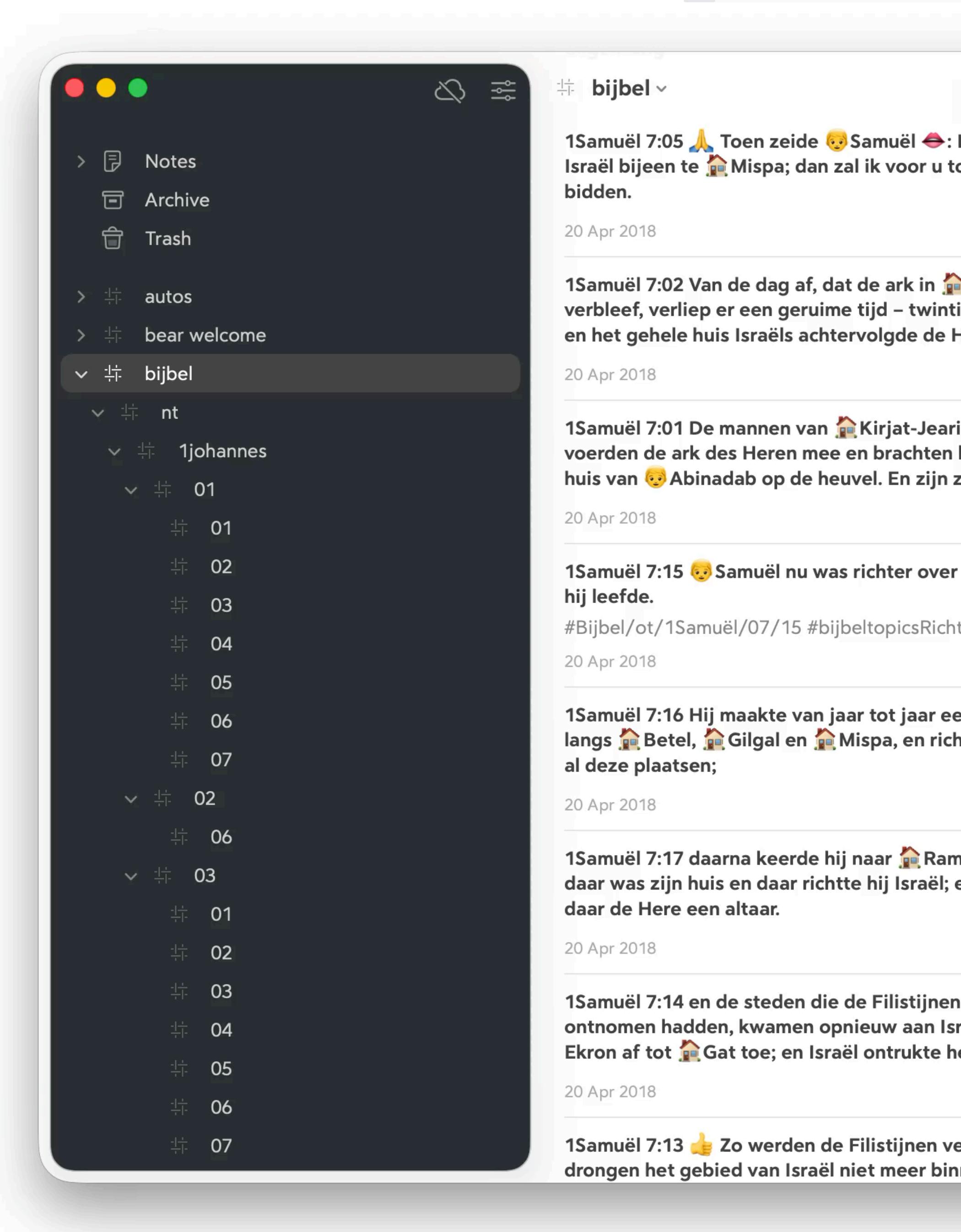




# But why?

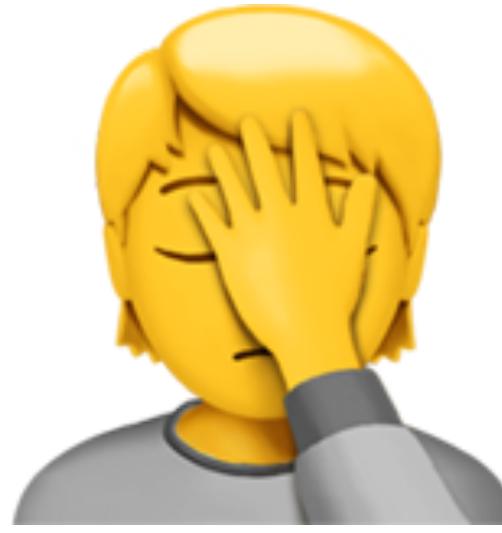
Data size not likely the cause

Then he showed us  
his sidebar



# Pinning the issue

- The sidebar is just a n-ary tree
- Stable node ids, parent pointers, ordered array of children
- We did everything by the book
- We even made sure the children were lazily loaded...



# “Lazy Loading” You Say?

I love the smell of pre-optimization in the morning



# The miracle

Single query, build in memory

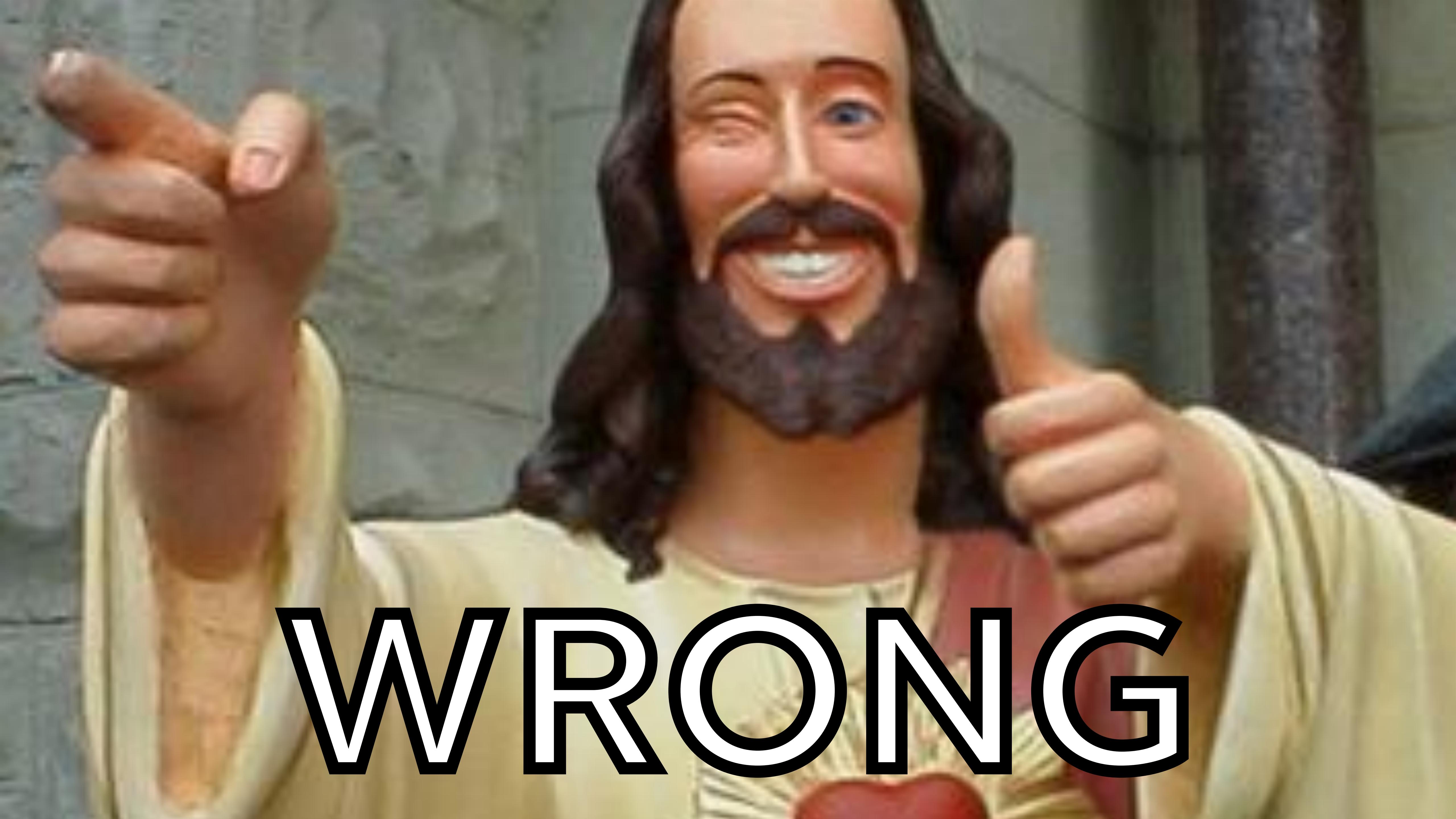
# 500ms

Average launch time



**INTERMISSION**



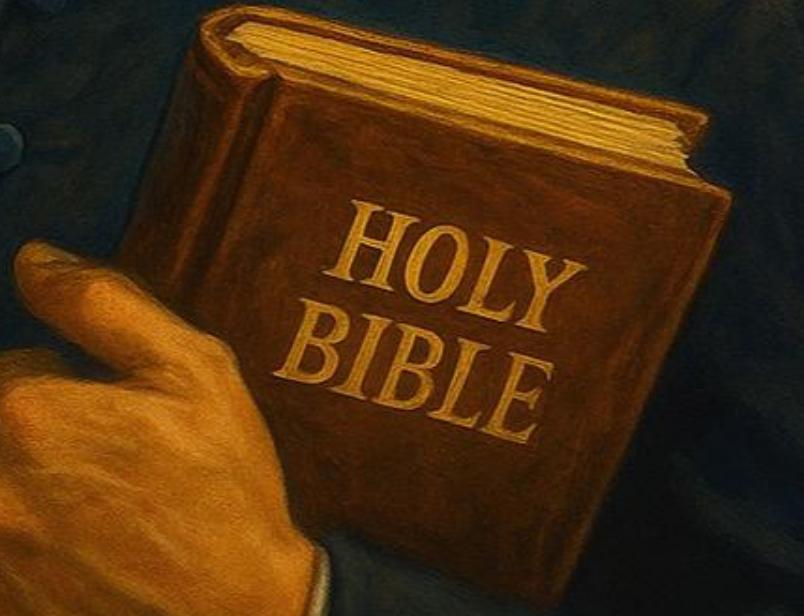


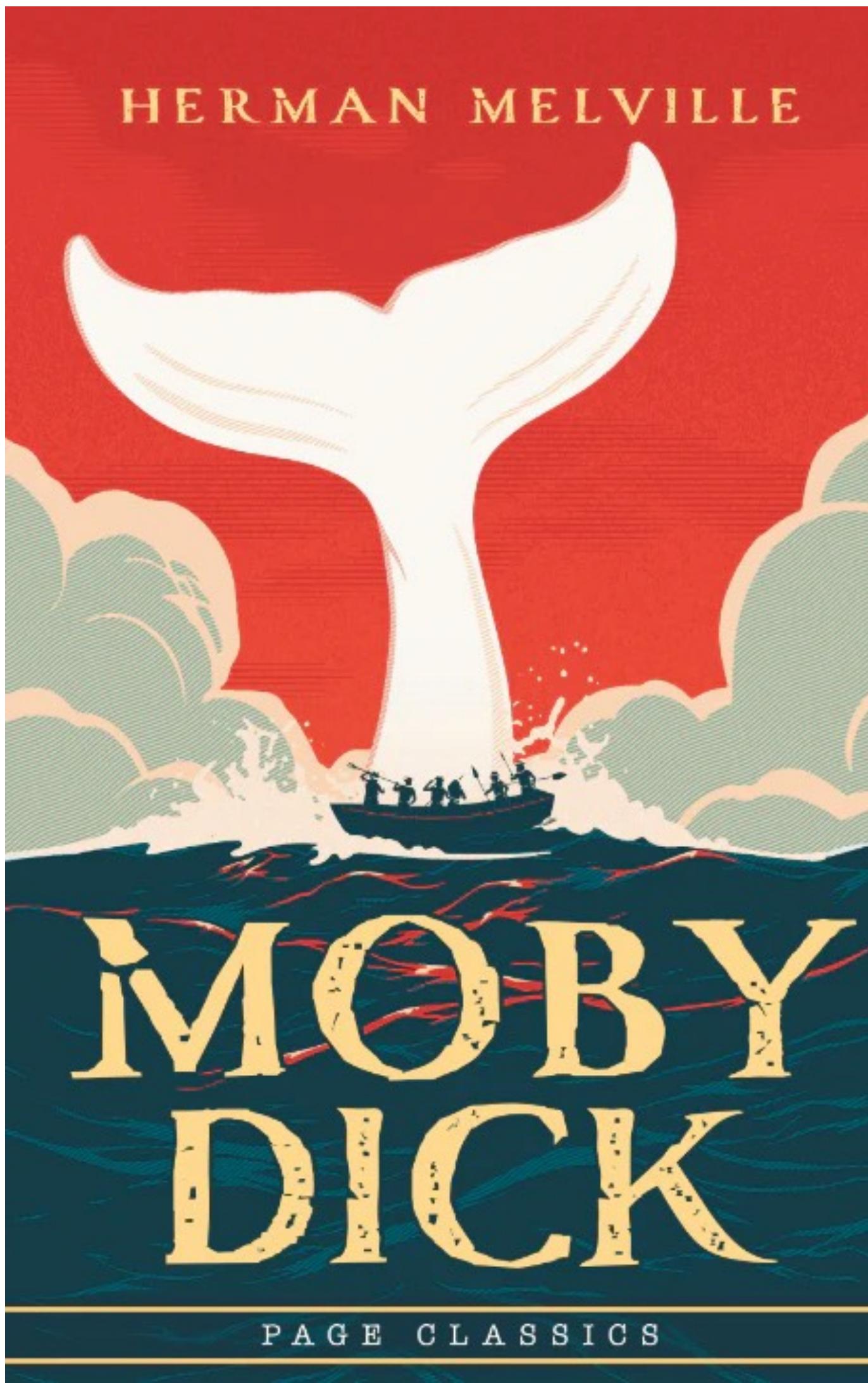
**WRONG**

# CHAPTER TWO



# THE IOWA PASTOR





Notes

- Untagged
- Todo
- Today
- Locked
- Pinned
- Archive
- Trash

sermons

sermons

Sermon 1

Just now

Sermon 2

A minute ago

Sermon 3

2 minutes ago

Sermon 4

2 minutes ago

Sermon 5

2 minutes ago

Sermon 6

2 minutes ago

6 notes

The screenshot shows a dark-themed desktop application window titled "sermons". The main content area displays a list of six sermon notes, each with a preview of its content (represented by a series of gray rectangles), the timestamp of creation, and a small edit icon. The sidebar on the left contains a "Notes" section with filters like "Untagged" and "Todo", and a "sermons" section which is currently selected. A large, semi-transparent illustration of an astronaut floating in space with a notepad is overlaid on the right side of the window.

Notes

- Untagged
- Todo
- Today
- Locked
- Pinned
- Archive
- Trash

sermons

All the sermons!

Just now

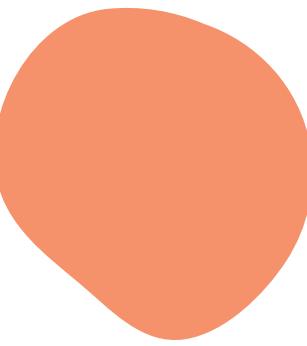
1 note

Just now

1 note











**SPOILER ALERT**



# SEARCH?

What's that?

- Take a string
- Use an algorithm to search
- Store the resulting ranges
- ???
- Profit 💰



$$A = \pi r^2$$

$$C = 2\pi r$$

	30°	45°	60°
sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
tan	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$



$$\int \sin x dx = -\cos x + C$$

$$\int \frac{dx}{\cos^2 x} = \operatorname{tg} x + C ,$$

$$\int \operatorname{tg} x dx = -\ln|\cos x| +$$

$$\int \frac{dx}{\sin x} = \ln\left|\operatorname{tg} \frac{x}{2}\right| + C$$

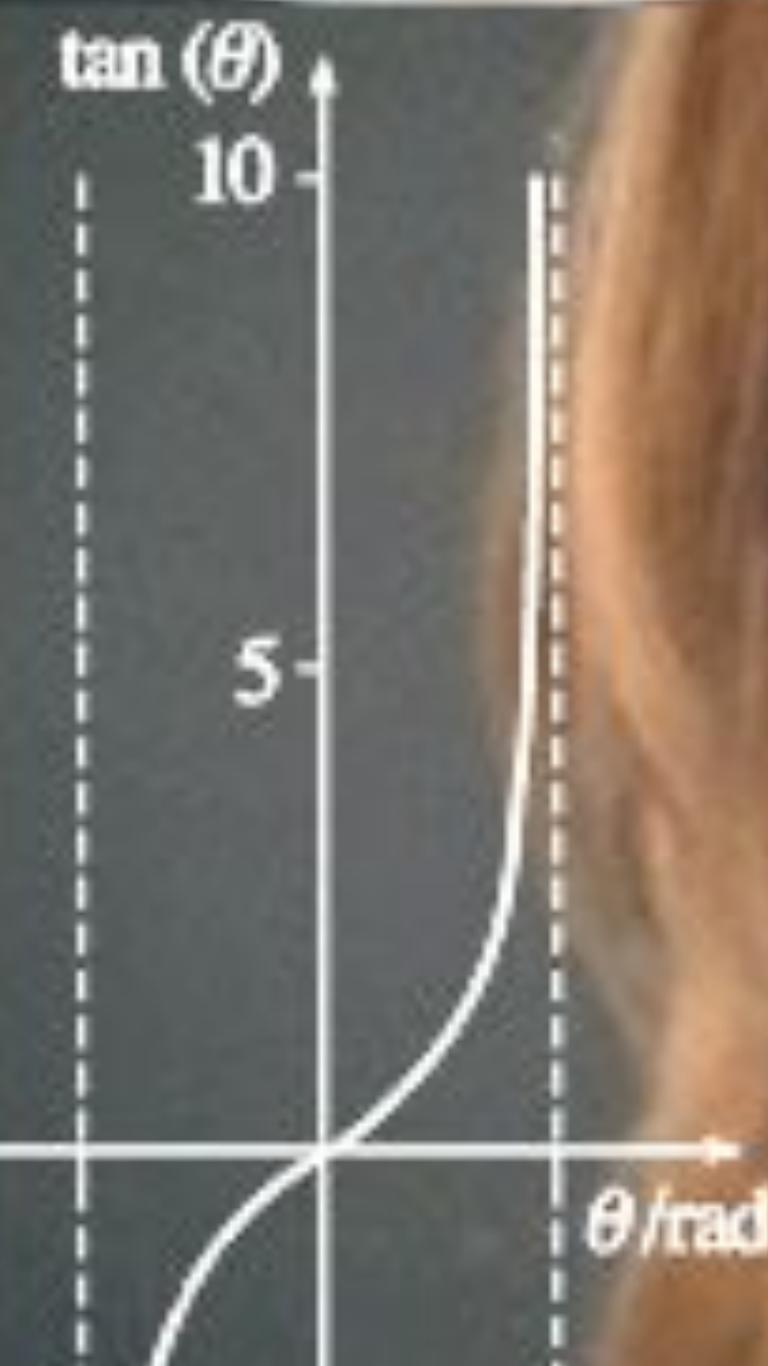
$$\int \frac{dx}{2-\operatorname{tg}^2 x} = -\arctg \frac{x}{2} +$$



$$V = \frac{1}{3} \pi r^2 h$$



$$V = \pi r^2 h$$



$$ax^3 + bx + c = 0$$

$$a(x^2 + \frac{b}{a}x + \frac{c}{a}) = 0$$

$$x_1 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Information	Detail	Reference
Status	Vulnerable	[Polar Bear Facts](link)
Population	22,000-31,000	[WWF](link)

Q v Vulnerable 1/1 × < > BIU ⓘ :

Information	Detail	Reference
Status	Vulnerable	Polar Bear Facts
Population	22,000-31,000	WWF

H ✓ ⚙️ B I 🔍 ⌂ 📸 ⋮

## TableAttachmentViewController

Information

Status

Population

Detail

Vulnerable

22,000-31,000

Reference

Polar Bear Facts 

WWF 

Attachment	In Markdown	Visible
Tables	✓	✓
Image OCR		✓
Folded Text	✓	
...		

## RESULT

```
class TextSearchResult
    var client: TextSearchable
    var clientRanges: [AnyHashable : NSRange]
```

Example of note with `search` string

Search 6/8

Example of note with `search` string

This is a table That contains Multiple search strings

Inside it For search Purposes

CAN I HAS SEARCHBURGER?

Some secret folded text

H B I

**Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis hidden search string a  
dolor in reprehenderit in voluptate velit esse.** [This is a link] () Excepteur sint occ  
cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

**This is a table**

Inside it

**That contains**

For **search**

**Multiple search strings**

Purposes



CAN I HAS  
SEARCHBURGER?



ded text



# Where to start?





- Run ⌘ R
- Test ⌘ U
- Profile ⌘ I
- Analyze ⌘ ⌥ B
- Archive
- Build For >
- Perform Action >
- Build ⌘ B
- Clean Build Folder... ⌘ ⌥ K
- Clear Test Results
- Clear All Issues
- Stop ⌘ .
- Build Documentation ⌘ ⌄ D
- Show Build Folder in Finder
- Copy Build Folder Path
- Export Localizations >
- Import Localizations...
- Scheme >
- Destination >
- Test Plan >
- App Shortcuts Preview

Bear > My Mac

MDTextEditor > MDTextKitUI > MDTextKitUI > Search > TextSearchable > TextSearchable

oundation

emented by the objects that want to expose a search  
protocol TextSearchable: AnyObject {

uuid: UUID { get }

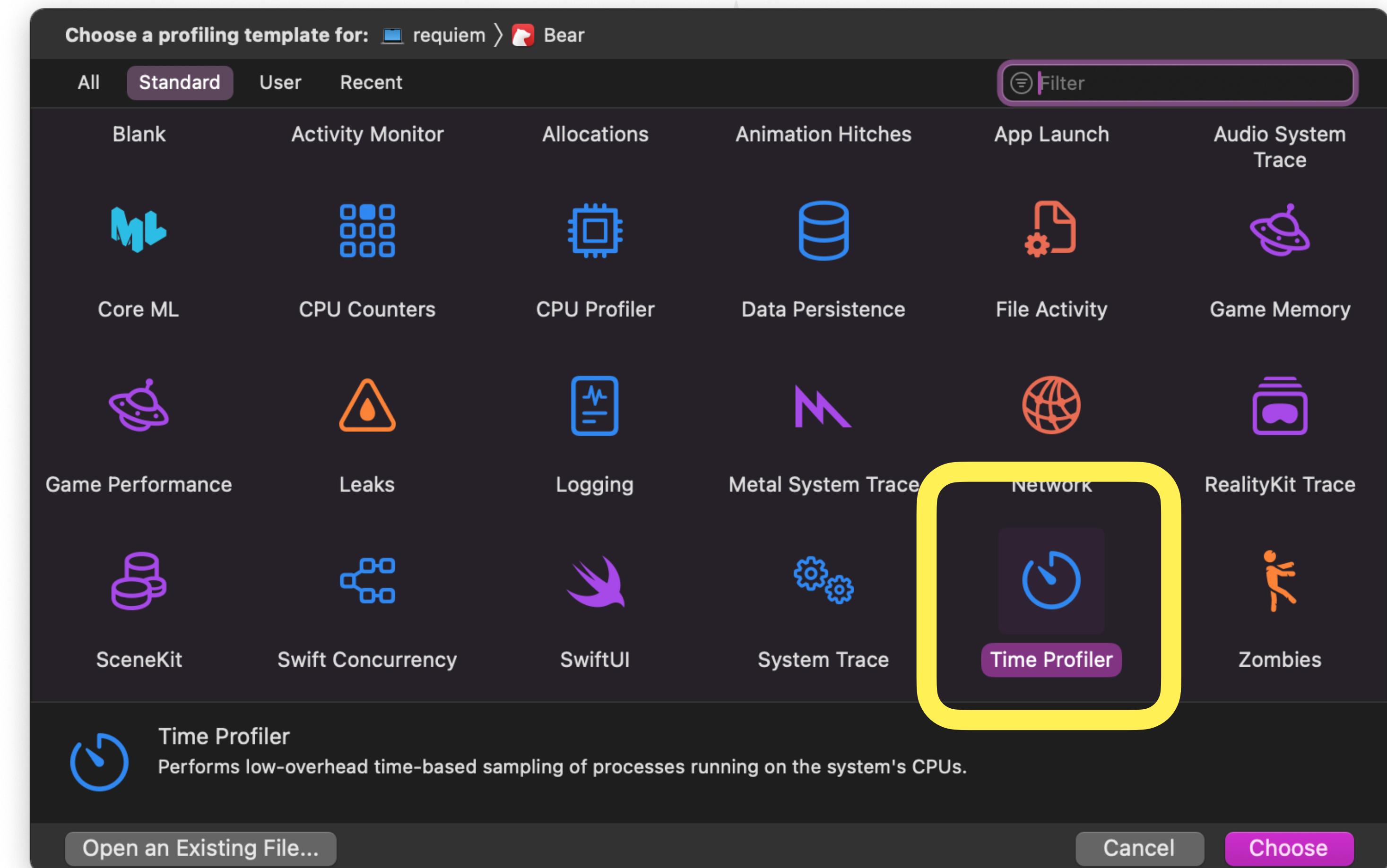
Reference to the "shared" search controller, main  
searchController: TextSearchController? { get set }

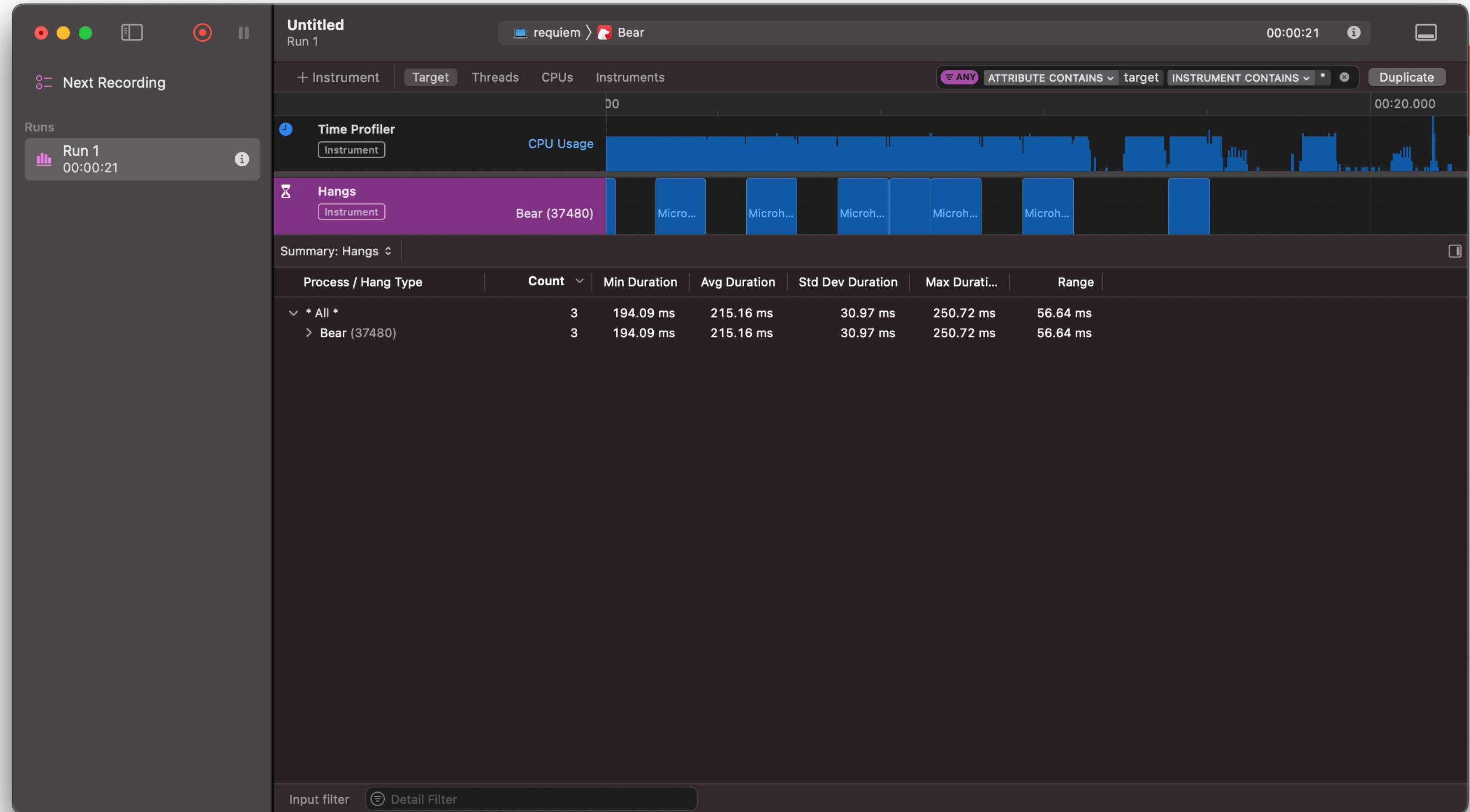
searchViewController: TextSearchCoreViewController?

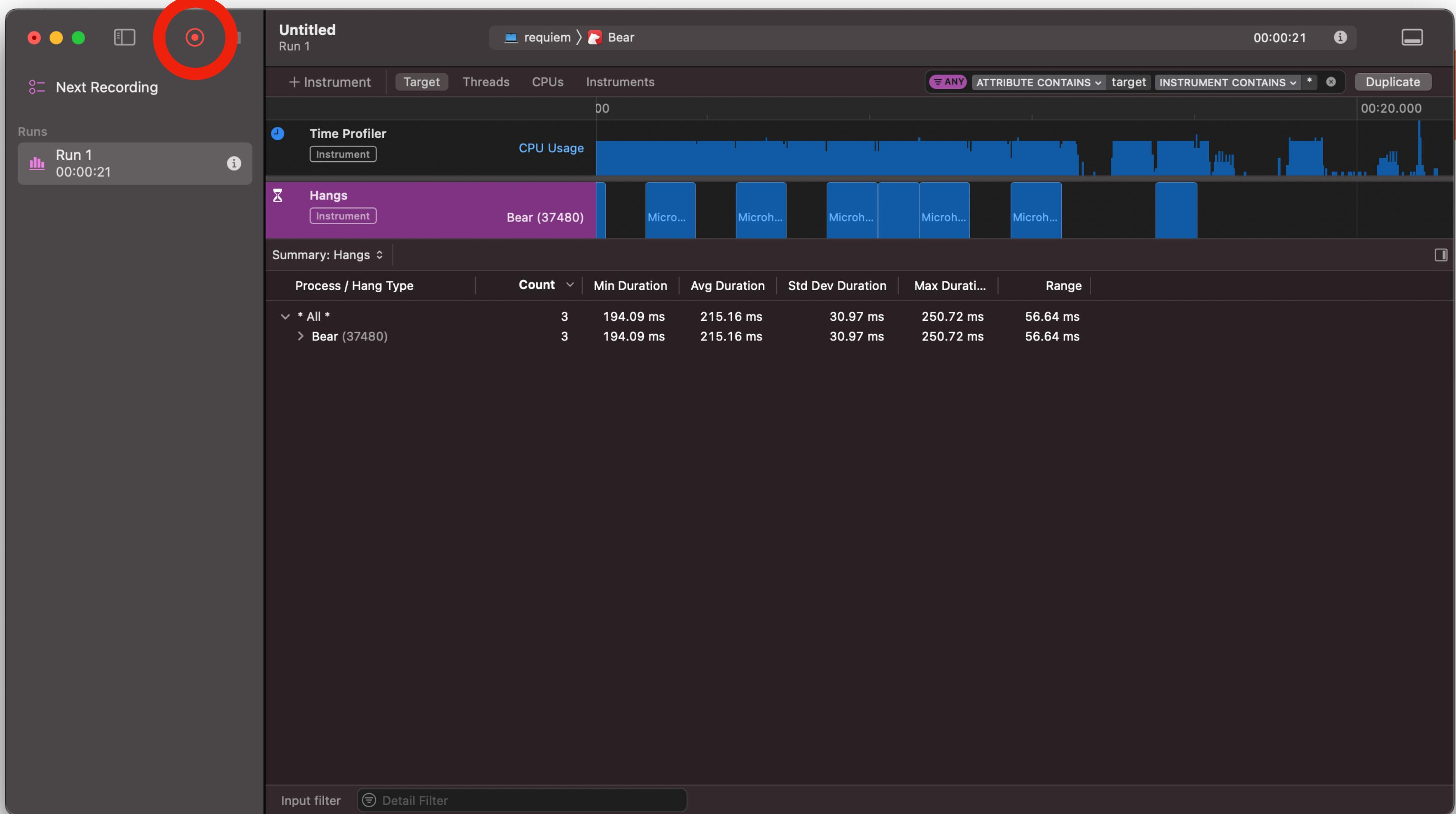
Perform a search for the `string` over itself and all

The result are ordered, the childs client result are

: searchResults(for string: String, options: TextSe







## Untitled

Run 1

requiem &gt; Bear

+ Instrument

Target

Threads

CPUs

Instruments

ANY

ATTRIBUTE CONTAINS

target

## Time Profiler

Instrument

CPU Usage

## Hangs

Instrument

Bear (37480)

Micro...

Microh...

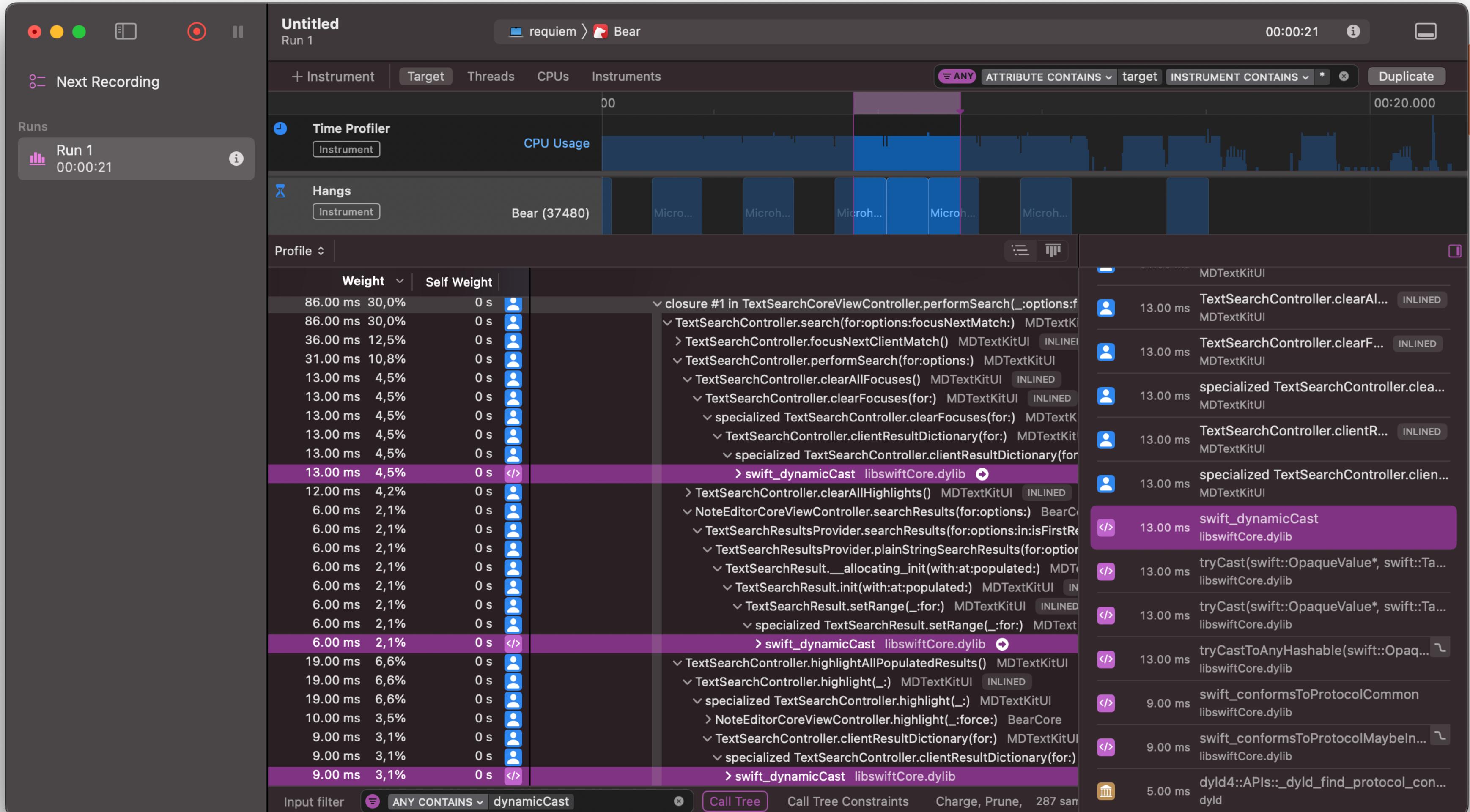
Microh...

Microh...

Microh...

## Summary: Hangs

Process / Hang Type	Count	Min Duration	Avg Duration	Std Dev Duration	Max Durati...	Range
▽ * All *	3	194.09 ms	215.16 ms	30.97 ms	250.72 ms	56.64 ms
▶ Bear (37480)	3	194.09 ms	215.16 ms	30.97 ms	250.72 ms	56.64 ms



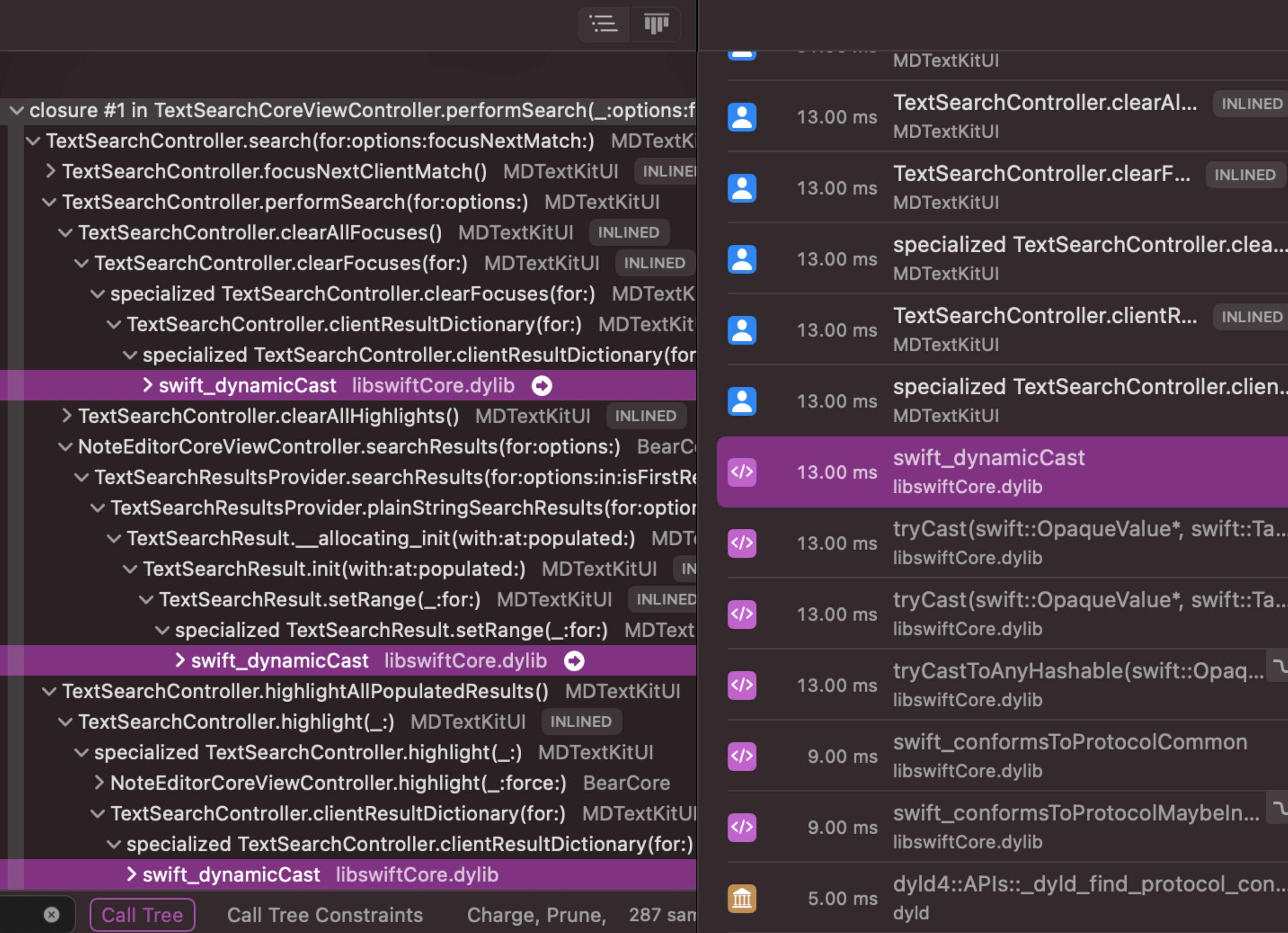
Micro...

Microh...

Microh...

Microh...

Microh...



Call Tree

Call Tree Constraints

Charge, Prune, 287 san

## Instrument

Bear (37480)

icroh...

croh... |

Profile ▾



Weight	Self Weight	
86.00 ms	30,0%	0 s
86.00 ms	30,0%	0 s
36.00 ms	12,5%	0 s
31.00 ms	10,8%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
13.00 ms	4,5%	0 s
12.00 ms	4,2%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
6.00 ms	2,1%	0 s
19.00 ms	6,6%	0 s
19.00 ms	6,6%	0 s
19.00 ms	6,6%	0 s
10.00 ms	3,5%	0 s
9.00 ms	3,1%	0 s
9.00 ms	3,1%	0 s
9.00 ms	3,1%	0 s

## Input filter



**ANY CONTAINS**  dynamicCast

## Call Tree

## Call Tree Constraints

charge, Prune, 287 san

## RESULT

```
class TextSearchResult
    var client: TextSearchable
    var clientRanges: [AnyHashable : NSRange]
```

## RESULT

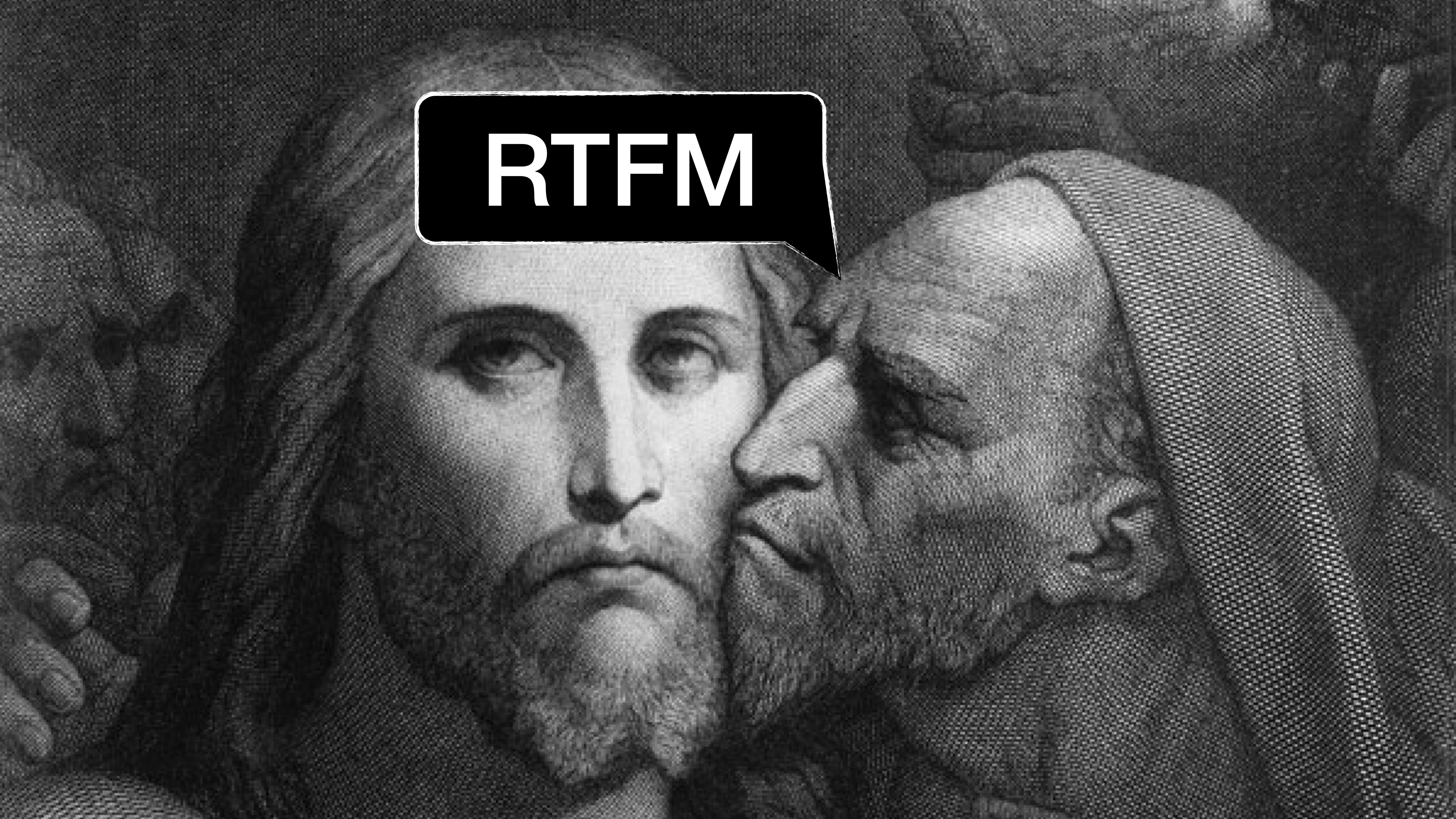
```
class TextSearchResult
    var client: TextSearchable
    var clientRanges: [AnyHashable : NSRange]
```

AnyHashable is a type-erased hashable value

## RESULT

```
class TextSearchResult
    var client: TextSearchable
    var clientRanges: [UUID : NSRange]
    var clients: [UUID : TextSearchable]
```

AnyHashable is a type-erased hashable value



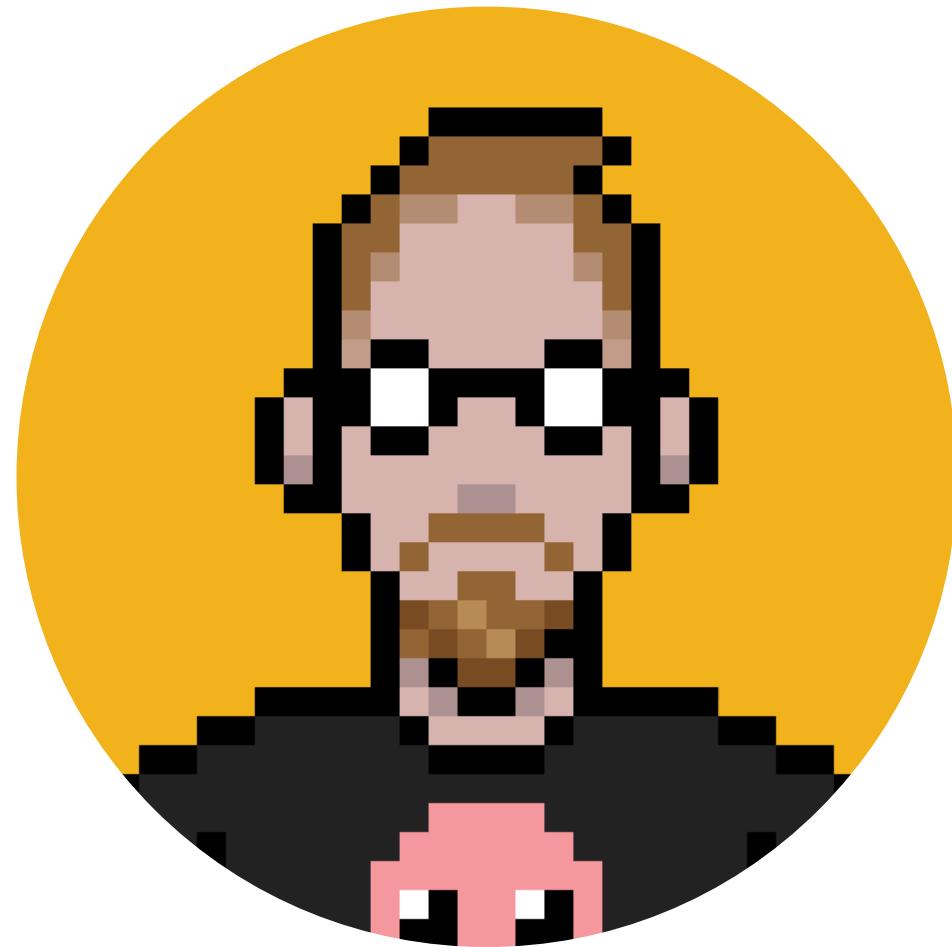
**RTFM**

# What we learned today

By fixing edge cases, we managed to:

- Make the app faster for everyone
- Simplify the code
- Get a reminder that pre-optimizing is dangerous
- Understand that even if you don't believe in something, that something can still affect you

# The Sacred Secret Behind Our App's Speed



# THANK YOU



nerolapis



matteo rattotti