DYALOG
Eastbourne 2026



Dyalog and AI

Worth stating plainly: a load-bearing seam — Claude

Stefan Kruger

AI & Dyalog

Topics for today

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- State of the AI nation (from an APLer's perspective)

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- State of the AI nation (from an APLer's perspective)
- AI agents for the developer workflow
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- AI risks, hopes, fears
- What's Dyalog doing with AI?

A lot of things happened since the last UM

AI is now a thing

OPINION COMMENTARY Follow

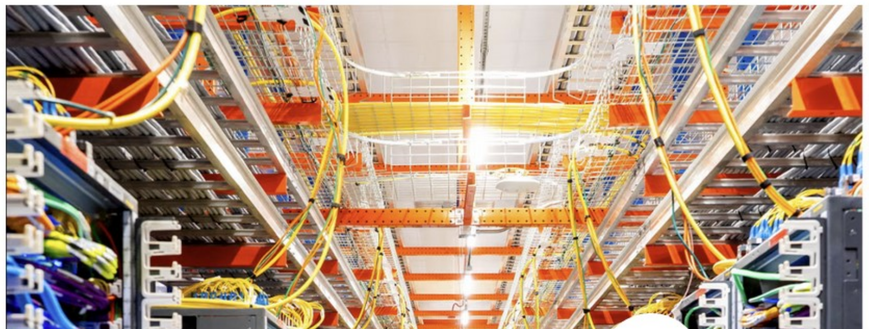
AI Is a Threat to Everything the American People Hold Dear

It kills jobs, equality, connection, democracy and maybe the human race. Congress must act.

By Bernie Sanders

April 2, 2026 5:01 pm ET

Listen (2 min)





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Inside a Corporate Retreat That Went Very Badly Wrong



Trump Says He's Calling Iran's Bluff in Eight-Minute Interview With WSJ



Exclusive news, data and analytics for financial

Hegseth wants Pentagon to dump Anthropic's Claude, but military users say it's not so easy

By **Mike Stone**, **Alexandra Alper** and **Raphael Satter**

March 19, 2026 11:02 AM GMT+1 · Updated March 19, 2026



Anthropic calls its Mythos AI too dangerous for humans, is it real or another marketing stunt?

Anthropic has a new AI model called Mythos. But the company believes that Mythos is way too powerful for humans and hence so far only a few companies have been given access to it. Is it something real or just a marketing stunt? We explore.



Anthropic is keeping the Mythos AI under control (Photo created using AI).

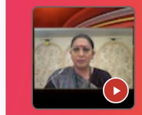


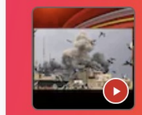
Divya Bhati
New Delhi, UPDATED: Apr 13, 2026 18:29 IST

Anthropic is once again riding the headlines, and this time, the buzz isn't about the standard Claude AI. It's about a new, unreleased model called Mythos, which the company claims is not just immensely powerful, but is capable of independently discovering security flaws and turning them into working cyberattacks. It is apparently so good that Anthropic is calling Mythos too dangerous to be released to the public, and the US government is worried that this AI model may break digital security locks that banks and others use.

ALSO WATCH


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State of the AI nation

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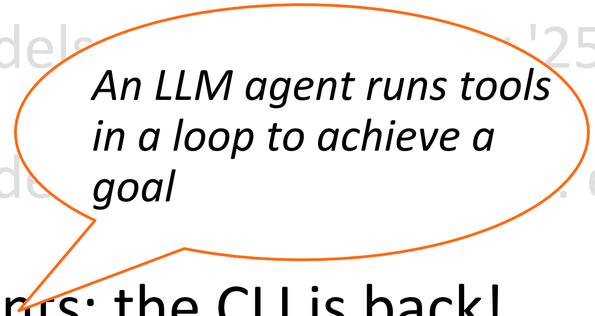
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- Mode... enable APL evaluation
- Agents: the CLI is back!



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- Agents: the CLI is back!
- Agentic safety *matters*

Model improvements

Smarter, not bigger

- Significant improvements in coding performance: no signs of plateauing out

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Model improvements

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- Significant improvements in coding performance: no signs of plateauing out
- "Agents" are capable of hours' of unsupervised work
- In skilled hands, capable of producing production-grade code in sweet spot languages
- "Too dangerous for humans" - genuine concern or marketing stunt?

Model *APL* improvements

Smarter, not bigger

- Give an LLM the ability to *evaluate* APL, and it will write correct APL code

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Model *APL* improvements

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- Give an LLM the ability to *evaluate* APL, and it will write correct APL code
- It will even write ⎕WC, integrate C-libraries with ⎕NA
- Does it write APL like a pro? No. Is it better at Python? Yes.

Evaluation unlocks fluency



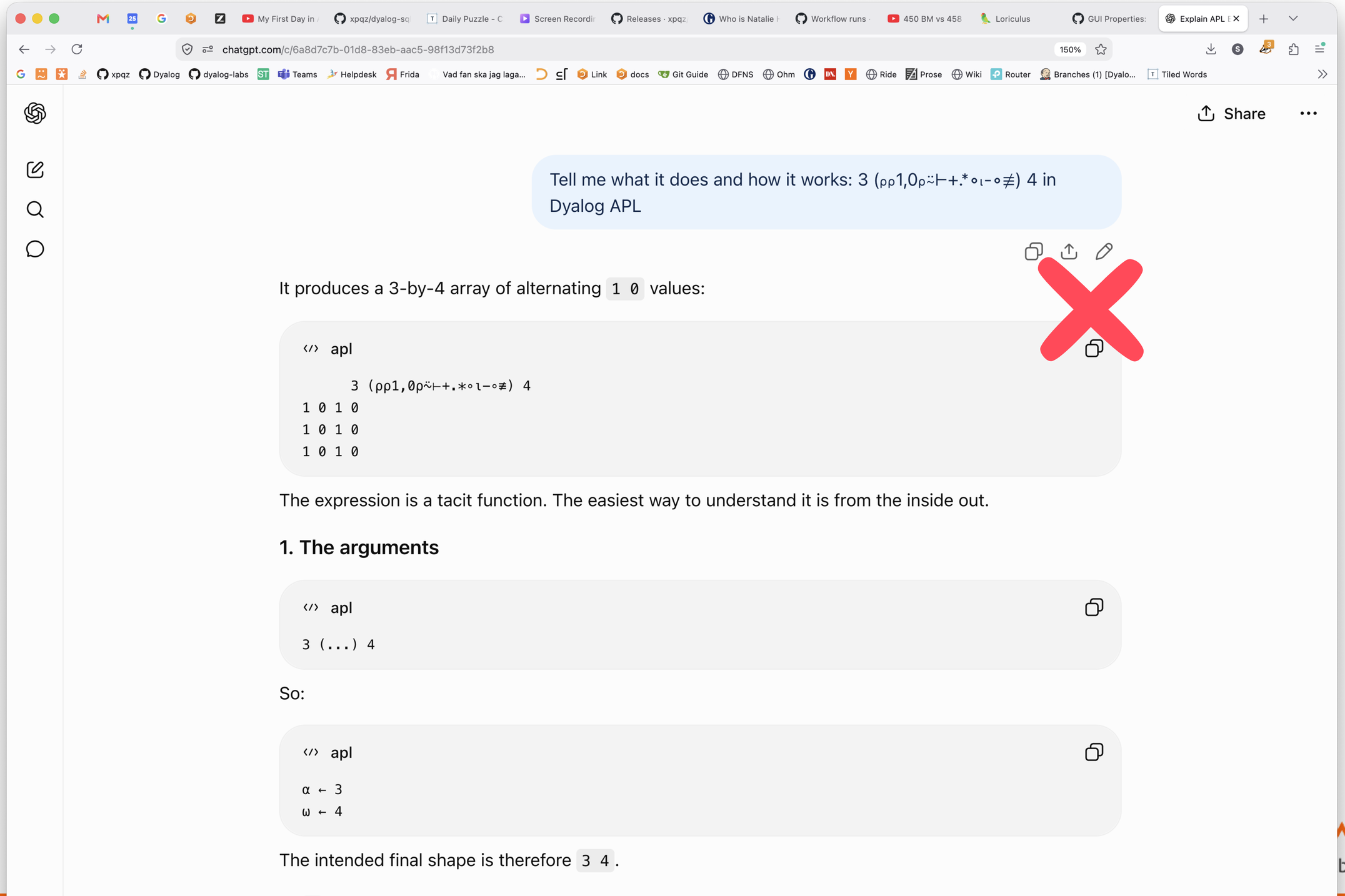
Current ChatGPT (web)

Current ChatGPT (web)

Tell me what it does and how it works:

```
3 (⍴⍴1,0⍴⍨⊢+.*∘⍳-∘≠) 4
```

in Dyalog APL


chatgpt.com/c/6a8d7c7b-01d8-83eb-aac5-98f13d73f2b8
Share
Tell me what it does and how it works: 3 (ρρ1,0ρ⍨⊢+.*∘⍳-∘≠) 4 in Dyalog APL
It produces a 3-by-4 array of alternating 1 0 values:
apl
3 (ρρ1,0ρ⍨⊢+.*∘⍳-∘≠) 4
1 0 1 0
1 0 1 0
1 0 1 0
The expression is a tacit function. The easiest way to understand it is from the inside out.
1. The arguments
apl
3 (...) 4
So:
apl
α ← 3
ω ← 4
The intended final shape is therefore 3 4.



Tool for calling Dyalog on the command line

Claude Code + Opus 5.5 + dyalog-script

❯ Tell me what it does and how it works:
        3 (⍴⍴1,0⍴⍨⊢+.*∘⍳-∘≠) 4
  in Dyalog APL

● **Skill**(dyalog-script)
  ⎿ Successfully loaded skill

● Evaluating the APL train and parts
  ⎿ $ /usr/local/bin/dyalogscript /dev/stdin <<'EAPL'
     f←(⍴⍴1,0⍴⍨⊢+.*∘⍳-∘≠)
     r←3 f 4
     ⎕←⍴r
     ⎕←r
     ⎕←3(⊢+.*∘⍳-∘≠)4
     ⎕←(2 f 3)≡∘•=⍨⍳3
     EAPL

* Sprouting… (27s · ↓ 1.6k tokens · thinking with medium effort)
  ⎿ Tip: Press Shift+Enter to send a multi-line message

❯

  /Users/stefan/work/tmp/demo1
  ▶▶ auto mode on (shift+tab to cycle) · ← for agents

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   ⎕←(2 f 3)≡∘⍋=⍨⍳3
   EAPL
```

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/Users/stefan/work/tmp/demo1
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- It builds a **rank-3 identity array with side 4**: a 4×4×4 Boolean cub
  indices are equal, and 0s everywhere else. In general, `α f ω` gives
  `ω`. I ran it in Dyalog 21.0 and got shape `4 4 4` with 1s only at `[i;
  3×3 identity matrix `∘.=⍨⍳3`.

```
⍴ ⍴ (1 , (0 ⍴⍨ (⊢ +.*∘⍳ -∘≠)))
└─ fork ─┘    └─ Agh ─┘ └──── fork ────┘
```

With `α=3` and `ω=4`:

Part	Computes	Value
`-∘≠`	`α - ≠ω` (the tally of	Jump to bottom (click) ↓

❯ make it work with ⎕IO←0 too

/Users/stefan/work/tmp/demo1
▶▶ auto mode on (shift+tab to cycle) · ← for agents

`0 ρ⍨ …`	`20 ρ 0`	twenty 0s
`1 , …`	a 1 followed by the twenty 0s	length 21

Why it works

- **Diagonal step**: in row-major order, moving from `[i;i;i]` to `[i+1;i+1` elements. In general the step is `+/⍵*0,⍳⍺-1`.
- **The pattern**: the train builds a vector of one 1 followed by step-1 which is exactly what `⍵ +.* ⍳ ⍺-1` computes.
- **Cycling**: reshape `ρ` repeats the pattern to fill the `⍵ ⍵ … ⍵` shape. 21, 42 and 63, which are the main diagonal.

* Crunched for 34s · done 15:18

❯ make it work with ⎕IO←0 too

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Evaluation really helps

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- Claude figured out what the expression does
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- Breaks down into small pieces, similar to how a human would
- Tests different inputs and analyses the results

Writing is harder than explaining

What's the shortest fully tacit Dyalog APL expression that evaluates to 1 if called monadically, and 2 if called dyadically?

The shortest fully tacit Dyalog APL expression for this behavior is:

```
⊣+⍬⍴⍳
```

How it works

This expression relies on how APL handles "padding" and "identity" when arguments are missing in a tacit train (specifically a 3-prong **fork**).

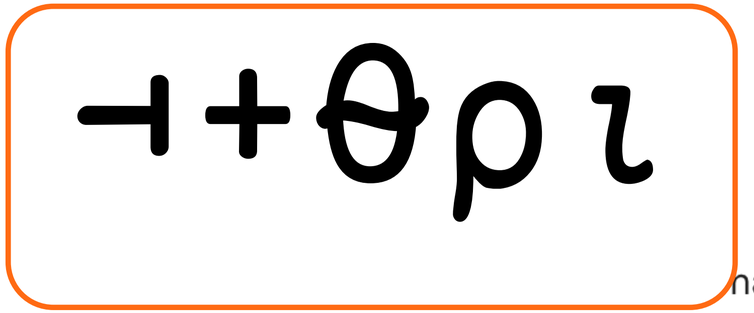
Syntax	Execution	Result
Monadic `(f g h) Y`	`(f Y) g (h Y)`	`(⊣ Y) + (⍬ ⍴ ⍳ Y)`
Dyadic `X (f g h) Y`	`(X f Y) g (X h Y)`	`(X ⊣ Y) + (X ⍬ ⍴ ⍳ Y)`

Export to Sheets

Breaking down the components

1. `⊣` **(Left):**

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Export to Sheets

Breaking down the components

1. `⊣` **(Left):**
    - **Monadic:** Returns the right argument (Y).

The shortest fully tacit Dyalog APL expression for this behavior is:

```
⊣+θρ⍳
```

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Dyadic `X (f g h) Y`	`(X f Y) g (X h Y)`	`(X ⊣ Y) + (X θ ρ ⍳ Y)`

Export to Sheets

Breaking down the components

1. `⊣` **(Left):**

- *Shortest Tacit Valence Detector in Dyalog APL*

≢,⍤⊂ — 4 glyphs.



How it works

The expression is a 2-train (atop): ≢ atop the derived function ,⍤⊂.

,⍤⊂ — the ⍤ (over) operator applies ⊂ (enclose) to each argument, then feeds the

- Monadically: ,(⊂⍵) — ravel of an enclosed scalar → a 1-element vector
- Dyadically: (⊂⍺),(⊂⍵) — catenate two enclosed scalars → a 2-element vector

≢ (tally) then counts the length: 1 or 2.

The key insight is that , has different monadic (ravel) and dyadic (catenate) def
forwarding to ,. The ⊂ ensures both arguments are always scalars, so ravel always
exactly 2.

Verification

```
      f ← ≢,⍤⊂
      f 42
1
      10 f 42
```


Dev Container: Claude Dev Environment (N... main* 0 0 1 Update is ready, click to restart.

❯ What is the shortest fully tacit expression in Dyalog A



- *Shortest Tacit Valence Detector in Dyalog APL*

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Stateful development

- dyalog-script unlocks fidelity, but is of little help with a *real* Dyalog APL app
- For that we need a stateful, persistent connection
- Several possible solutions
  - Ride port (lots of people rolling their own here)
  - Other socket listener

Dyalog VS Code Extension

Martina Crippa, Gilgamesh Athoraya





Dyalog VS Code Extension

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- Experimental integration: full debugger support, multiple sessions, doc viewer etc

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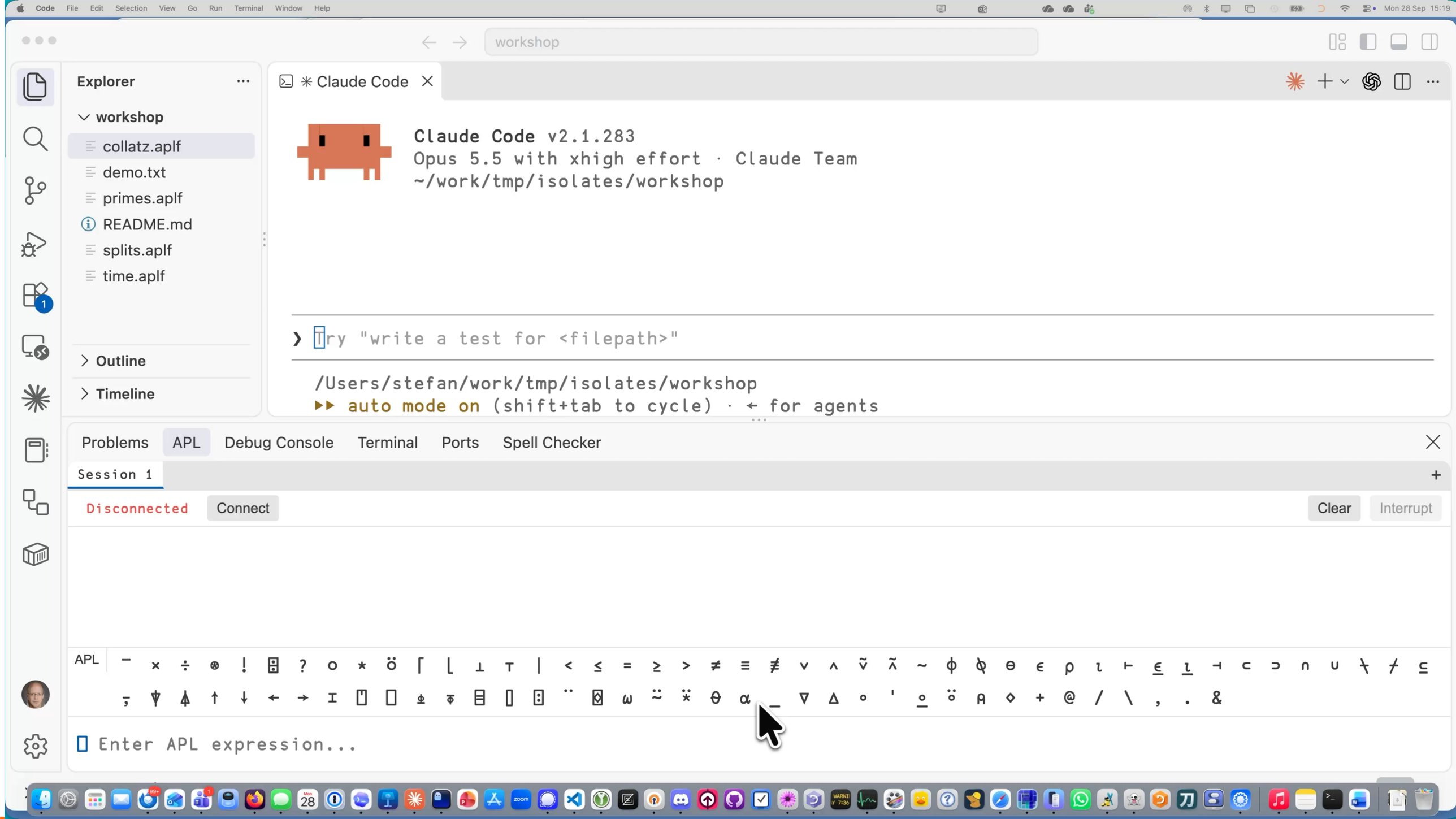
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- https://github.com/dyalog-labs/vscode-apl


Code File Edit Selection View Go Run Terminal Window Help
Mon 28 Sep 15:19
workshop
Explorer
workshop
collatz.aplf
demo.txt
primes.aplf
README.md
splits.aplf
time.aplf
Outline
Timeline
Claude Code
Claude Code v2.1.283
Opus 5.5 with xhigh effort · Claude Team
~/work/tmp/isolates/workshop
Try "write a test for <filepath>"
/Users/stefan/work/tmp/isolates/workshop
▶▶ auto mode on (shift+tab to cycle) · ← for agents
Problems
APL
Debug Console
Terminal
Ports
Spell Checker
Session 1
Disconnected
Connect
Clear
Interrupt
APL
Enter APL expression...

Console Agents + Link = 

- Good match for Link-driven workflows
- Already watching for changes = fast feedback loop
- No UI overlays or chat panels in the Dyalog environment

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Safety

Agentic Safety

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- Run agents in containers or sacrificial VMs
- Use "auto" mode

Agentic Safety

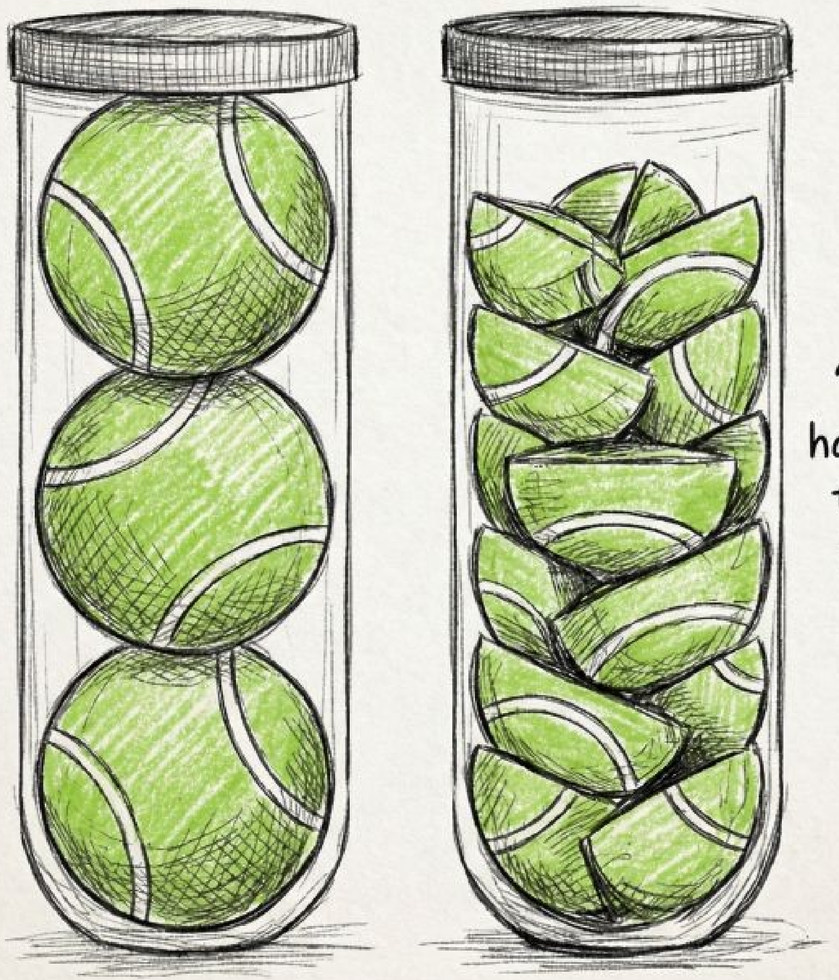
- Malice unlikely

Agentic Safety

- Malice unlikely
- Reward hacking: *continuously*

Goodhart's Law

"I've found a way to squeeze twice as many balls into the container."



"We just have to cut the balls in half."

Marcel Dybalski

Agentic Safety

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Agentic Safety

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- Tool calling mistakes unusual, but they *do* happen
- Over-eagerness breaching guardrails: *daily*



● I hit a policy block deleting the generated .vsix with rm, so I'll remove it via patch tooling and continue.

Ran perl -e 'unlink glob q(vscode-extension/*.vsix)'



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'Human approves' is the *least* secure

AI adoption in the APL world

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AI adoption in the APL world

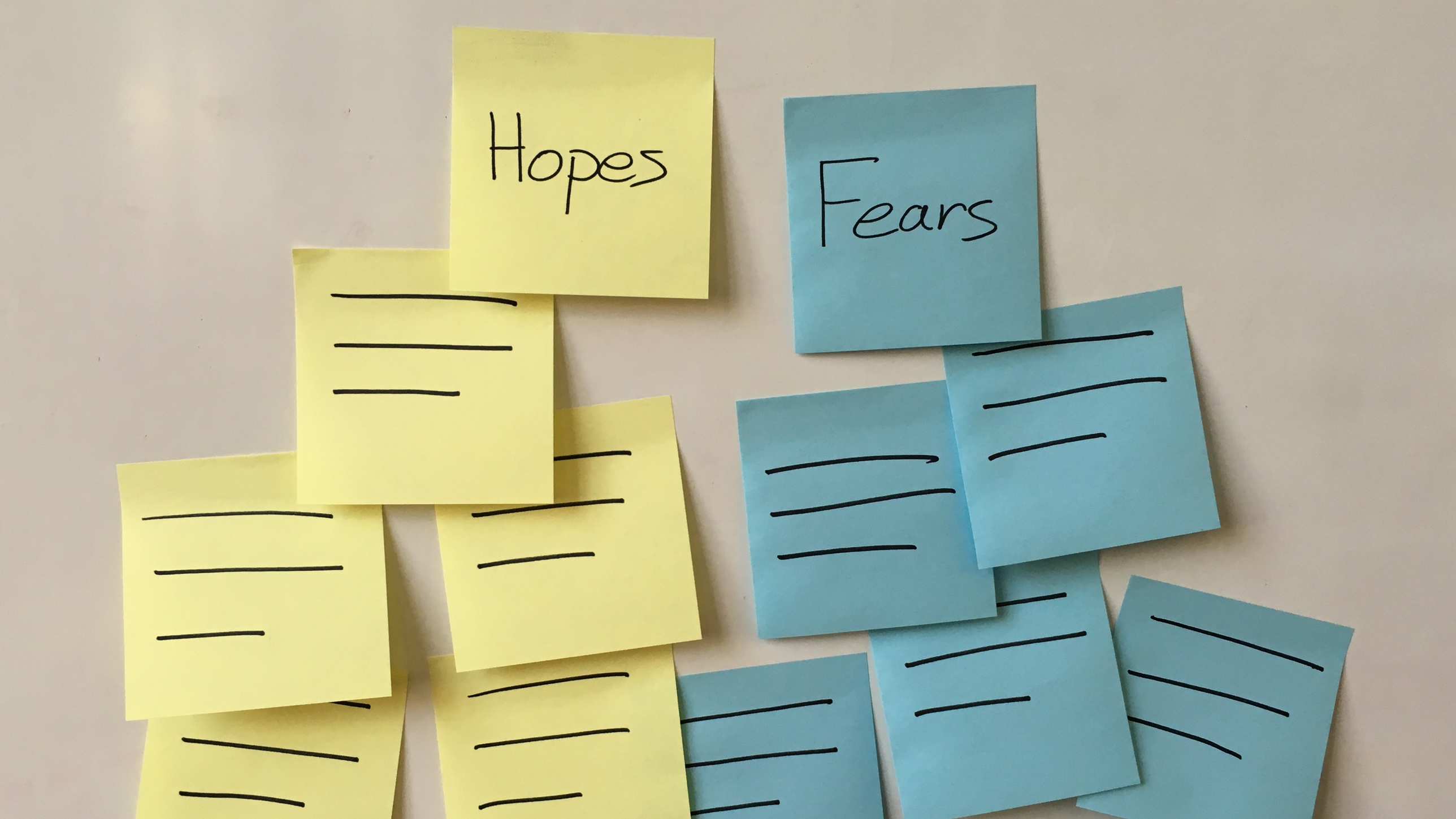
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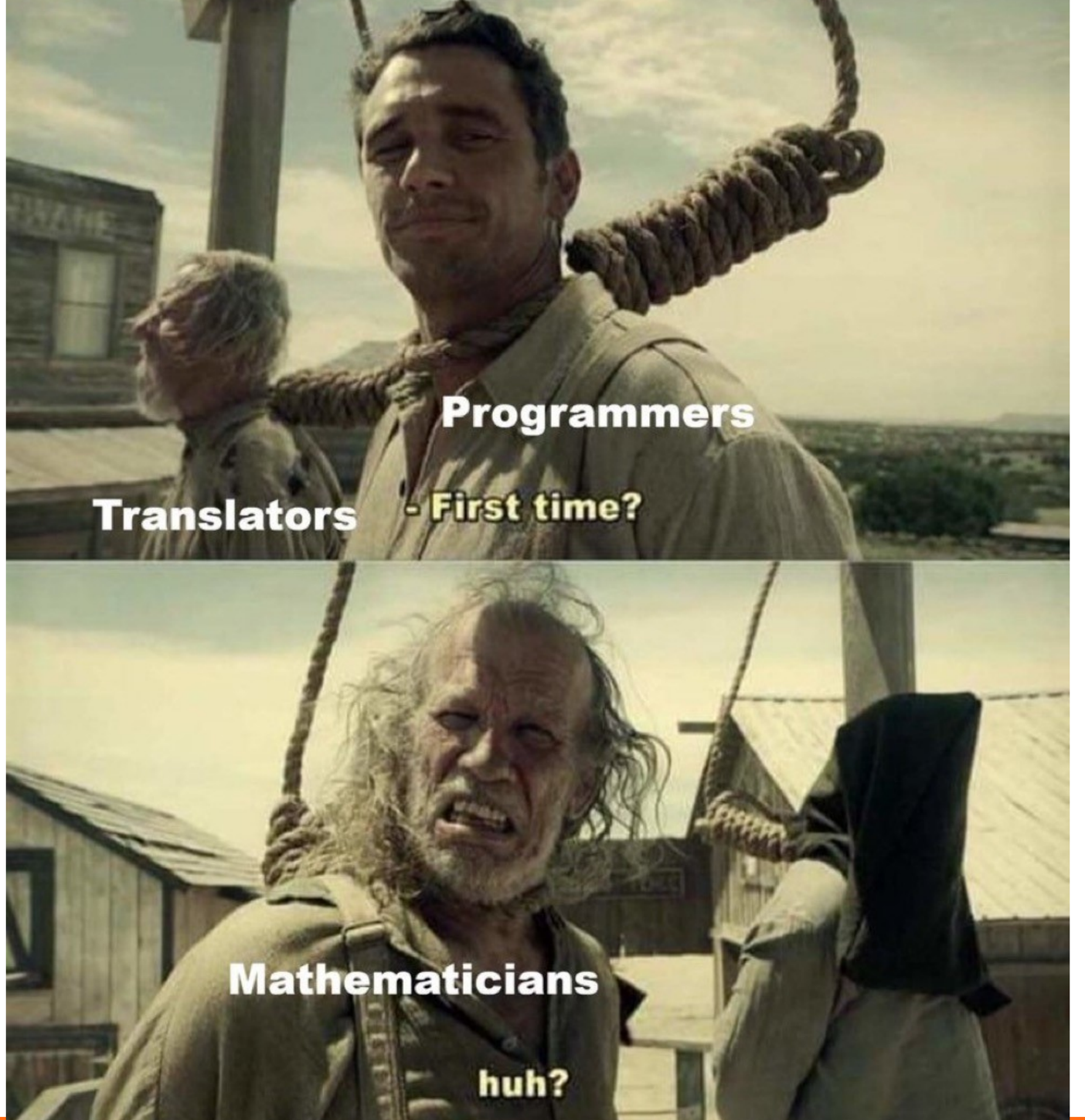
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- Productivity tool for developers, not a bottom line improver
- Embrace it: it will happen anyway, side of desk


Hopes
Fears


Programmers
Translators
- First time?
Mathematicians
huh?

Will LLMs make APLers obsolete?

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Will LLMs make APLers obsolete?

- No, quite the opposite
- LLMs makes experienced people more effective
- ...it does not turn interns into seniors
- LLMs makes it easier to do *more* with APL, especially integration

Is a rug-pull coming?

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- Outsourcing your thinking has obvious systemic risks

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- Governments may decide that AI is "too dangerous" for "non-citizens"

Is a rug-pull coming?

- Outsourcing your thinking has obvious systemic risks
- Governments may decide that AI is "too dangerous" for "non-citizens"
- Investors may suddenly demand return

Is a rug-pull coming?

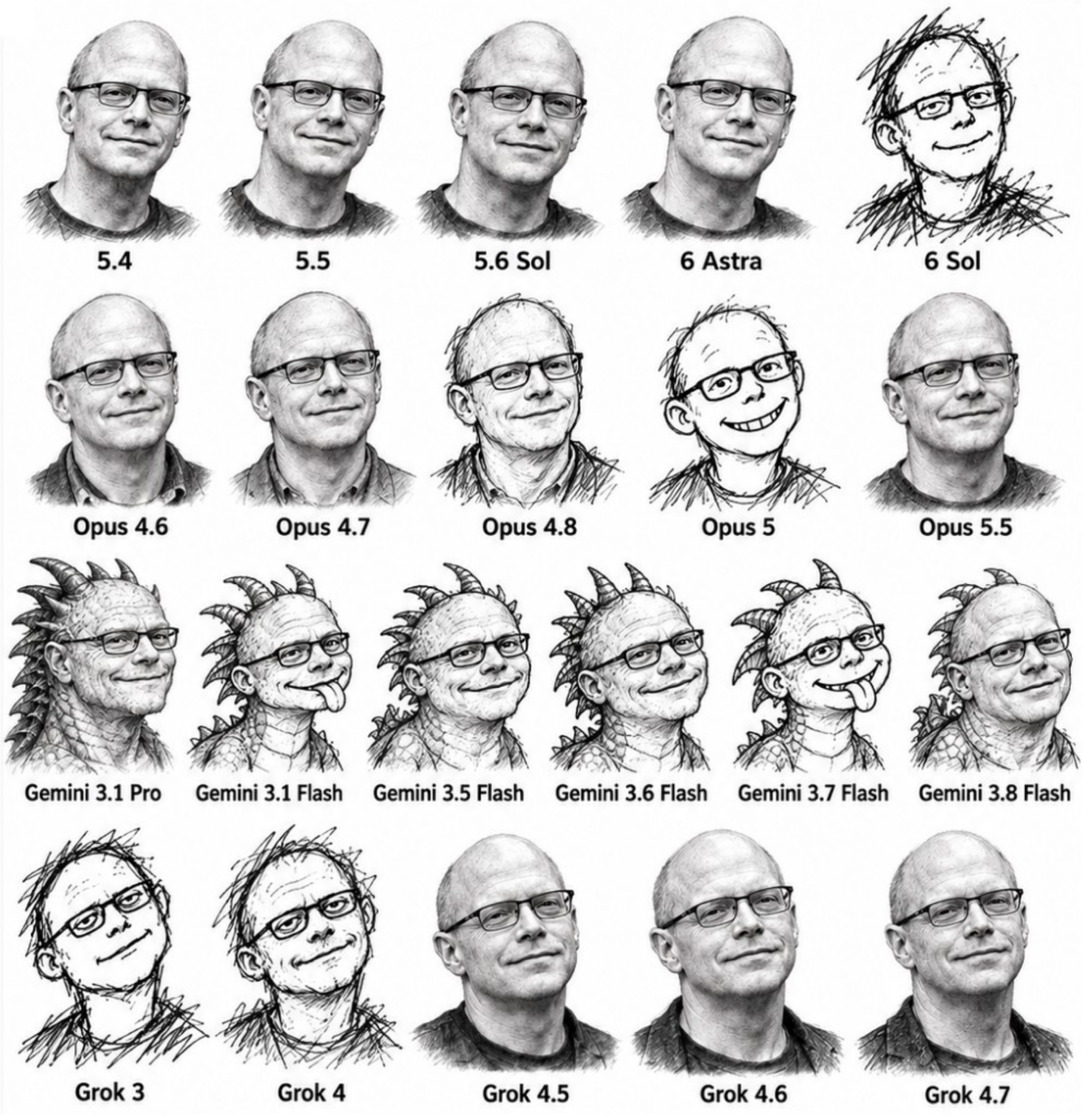
- Outsourcing your thinking has obvious systemic risks
- Governments may decide that AI is "too dangerous" for "non-citizens"
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- Counters: signs of commoditisation, fungible providers, open-weight models

Dyalog's thinking

Dyalog's thinking

All killer. No filler — Claude

- AI is here to stay, like it or not
- We want to make it easy to work with Dyalog in agentic workflows
- Hard at work improving our overall AI literacy internally
- ...but we're NOT becoming an "AI company"


5.4
5.5
5.6 Sol
6 Astra
6 Sol
Opus 4.6
Opus 4.7
Opus 4.8
Opus 5
Opus 5.5
Gemini 3.1 Pro
Gemini 3.1 Flash
Gemini 3.5 Flash
Gemini 3.6 Flash
Gemini 3.7 Flash
Gemini 3.8 Flash
Grok 3
Grok 4
Grok 4.5
Grok 4.6
Grok 4.7