DAY 17 · Part 2 · How We Got Here

Why write out the work instead of answering right away? — Thinking before answering

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Once it wrote out its work instead of answering right away, it started getting right what it used to get wrong.

In a nutshell

1. The secret to AI suddenly getting good at hard problems wasn't getting bigger — it was making it **go through the steps before answering**.

2. At first, it worked when a person told it 'think step by step,' but later came **models trained to write out their work on their own first**. These are called reasoning models.

3. But there's a price. The longer it thinks, **the slower the answer and the more text it writes**. So for easy questions, it doesn't bother.

In one picture

Answering right away vs. thinking first

Answer right away

· Sees the problem, answers at once
· Fast, writes very little
· Often gets hard math wrong

→

Think, then answer

· Writes out the steps first
· Slow, writes a lot
· Accuracy on hard problems jumps

On the same US high school math competition problems, the model that answered right away got 12% right, while the model specially trained to write out its work first got 74%.

Key idea: instead of making the model bigger, 'letting it think longer' also boosts performance

Put the steps of the work in order

The apple problem

1. There are 23 apples
2. Use 20, and 3 are left
3. Buy 6 more: now 9
4. So the answer is 9

Write down each in-between number and you won't get mixed up. Models are the sa...

A reasoning model's turn

1. Restate the problem
2. Write out the steps
3. Check in-between answers
4. Say only the final answer

The key is the third one. It looks back at the in-between answers it wrote and...

The price you pay

1. Thinks for longer
2. Writes a lot more text
3. Answers come slower
4. But gets hard ones right

Thinking time isn't free. So for easy questions like 'what's the weather today,...

Tap the mixed-up pieces in the order you think is right. When you've picked them all, it'll grade you. The poin...

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Quick check

Just three questions

Q1

What makes a reasoning model different from earlier models?

① It memorizes whole answers
② It makes its answers shorter
③ It always searches the internet
④ It works through the steps before answering

Q2

What happened on the same math competition problems?

① It went up from 12% to 74%
② It dropped from 74% to 12%
③ Both got 100%
④ There was no difference

Q3

What does thinking first cost?

① Accuracy
② Time and words written
③ Internet speed
④ Screen brightness

Know the why, too

Q1

④

Instead of answering straight away, it writes out its work and checks the in-between answers. That's why it makes fewer mistakes on hard problems.

Q2

①

The model that answered right away got 12%, and the one that thinks first got 74%. It was specially trained to write out its work before answering, and that's why the gap got...

Q3

②

The longer it thinks, the slower the answer and the more text it writes. So for easy questions, it doesn't bother with this.

Once it wrote out its work instead of answering right away, it started getting right what it used to get wrong.



Tomorrow: AI that uses tools — when should it stop working things out itself and grab a calculator?