

Essentials of AI for Life and Society

GPT-4



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TECH

OpenAI announces GPT-4, claims it can beat 90% of humans on the SAT

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MOTHERBOARD
TECH BY VICE

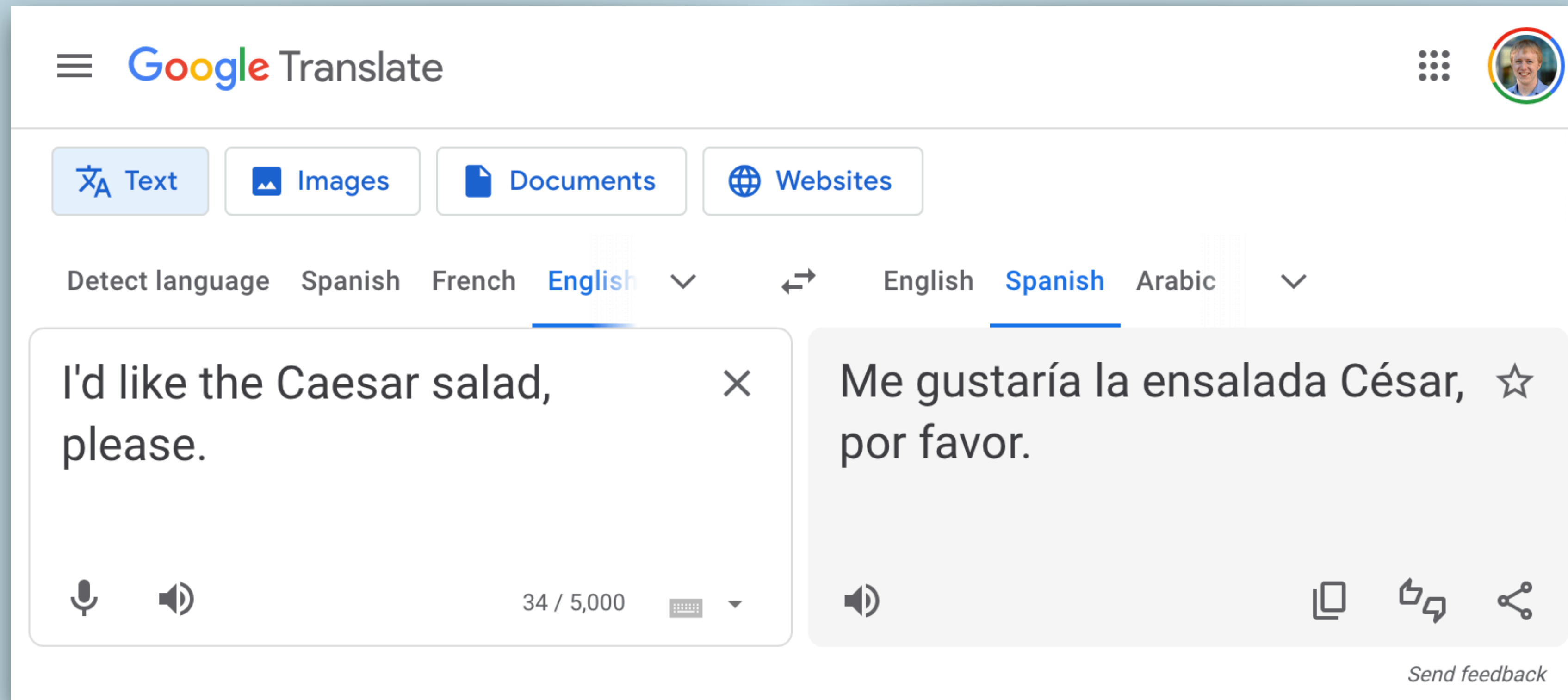
The New GPT-4 AI Gets Top Marks in Law, Medical Exams, OpenAI Claims

The successor to GPT-3 could get into top universities without having trained on the exams, according to OpenAI.



By Samantha Cole

Five years ago, you could do this:



Five years ago, you could do this:



Now, you can do this:



I'm supposed to come up with a topic for my European history essay. I have to write about one of the Tudor monarchs. Who would be three interesting monarchs to write about?

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Sure, the Tudor dynasty, which ruled England from 1485 to 1603, was filled with interesting figures, each with their own unique impact on the course of history. Here are three that might make for a compelling essay:

1. **Henry VII** (Reign: 1485–1509): The founder of the Tudor dynasty. He seized the throne after defeating Richard III at the Battle of Bosworth Field, effectively ending the Wars of the Roses. His reign marked the transition from medieval to early modern England, and his economic, diplomatic, and administrative policies helped stabilize the kingdom after years of civil war. His marriage to Elizabeth of York also symbolically united the houses of York and Lancaster.
2. **Henry VIII** (Reign: 1509–1547): Perhaps the most famous Tudor monarch, Henry VIII is best

Now, you can do this:



I'm working on a song about a breakup and I need a word that rhymes with "doubt" that thematically relates to sadness. Can you suggest a few words?

Now, you can do this:

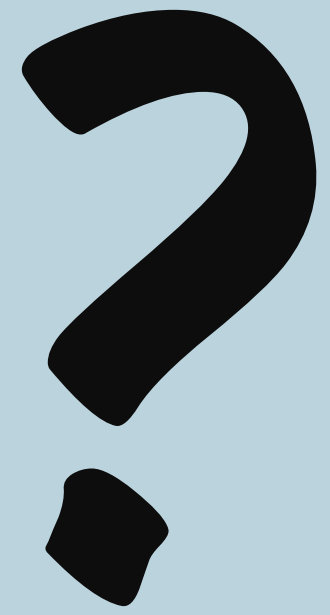


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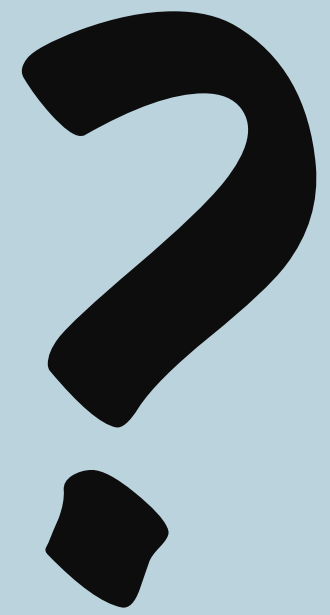


Sure, here are a few words that rhyme with "doubt" and thematically relate to sadness:

1. "Shout" - This can refer to the anger or frustration that can come with a breakup.
2. "Rout" - This word means a decisive defeat. It could be used metaphorically to describe feeling overwhelmingly defeated after a breakup.
3. "Spout" - This could be used to refer to speaking or crying extensively about the breakup.
4. "Out" - This word could be used in the context of feeling left out or excluded after a breakup.
5. "Scout" - This word could be used to symbolize looking or searching for love or happiness after a breakup.
6. "Clout" - This could indicate the power or influence the other person had in the relationship, causing the sadness post-breakup.

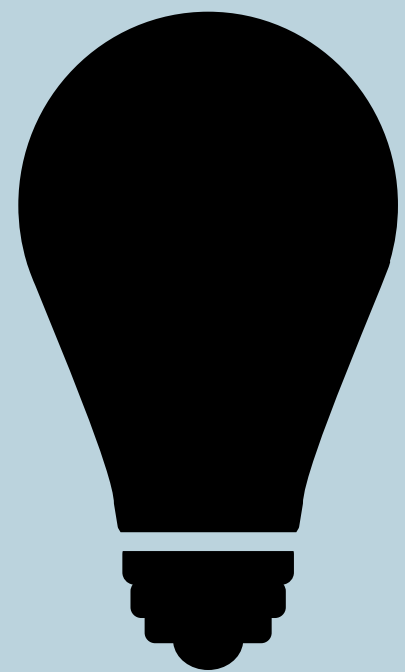


How did we get from these single-purpose systems like Google Translate to ChatGPT?



What's the core technology behind LMs?
(Neural nets, maximum likelihood estimation, Transformers)

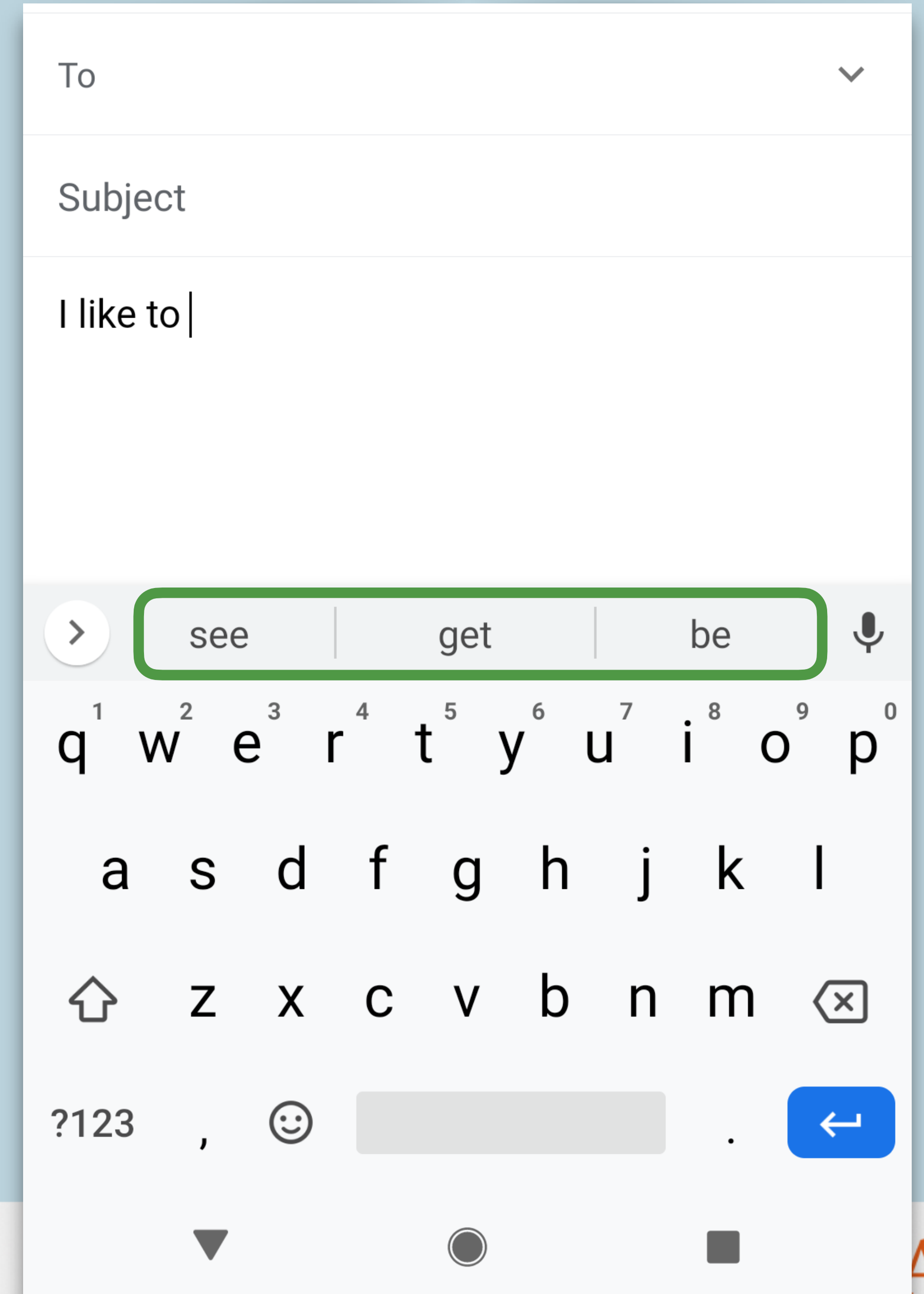
How does ChatGPT go beyond a basic LM?



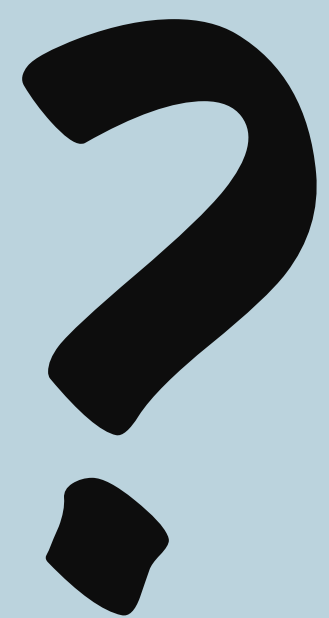
We'll contextualize where these models are and how they're impacting society.

Language Modeling

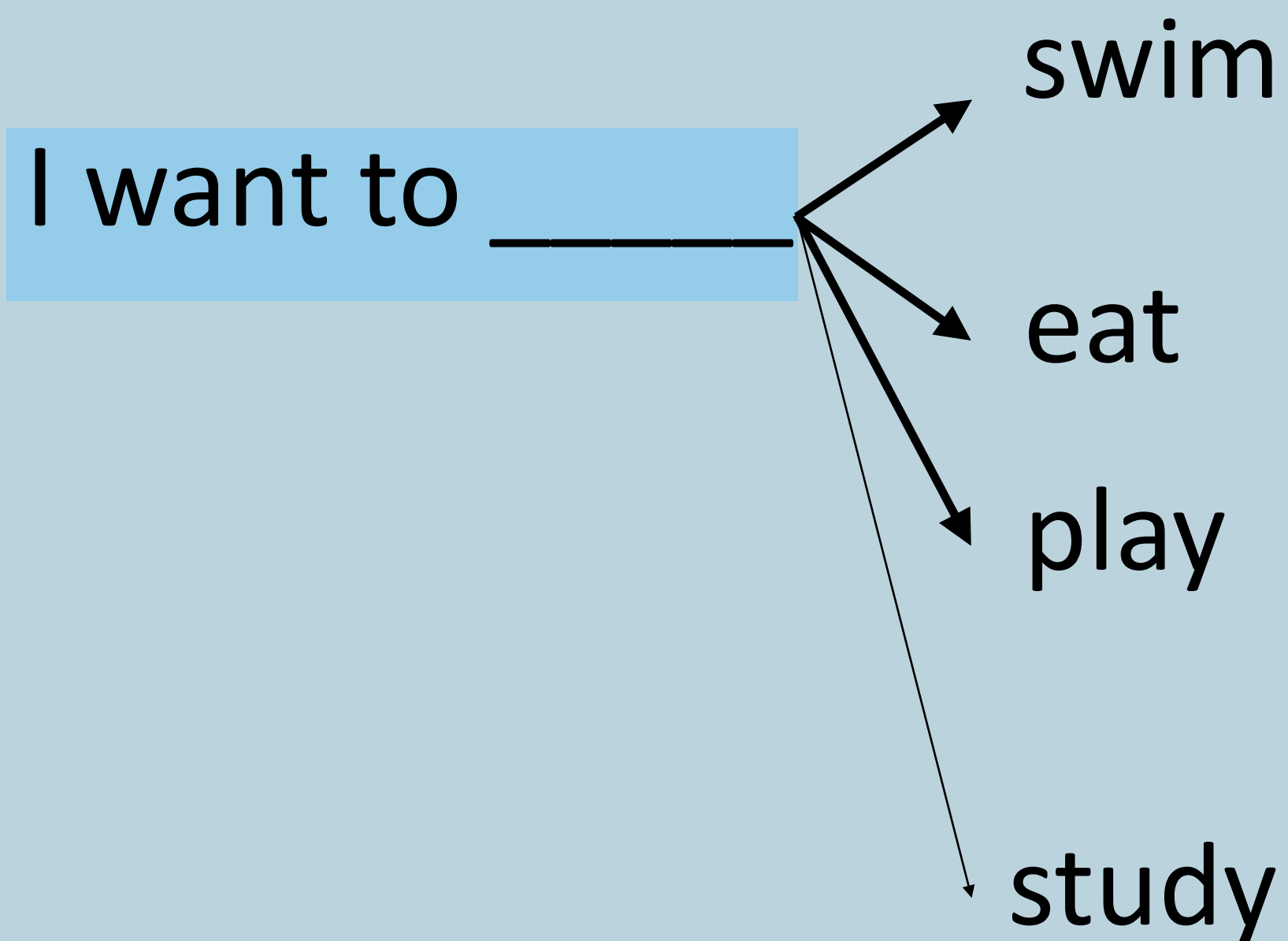
- Language modeling is the same as predictive text: Given a sequence of words so far (the **context**), predict what comes next, like in predictive text!
- We never know for sure what comes next, but we can still make good guesses!
- **We can't write rules to do this. We need machine learning!**



Language Modeling

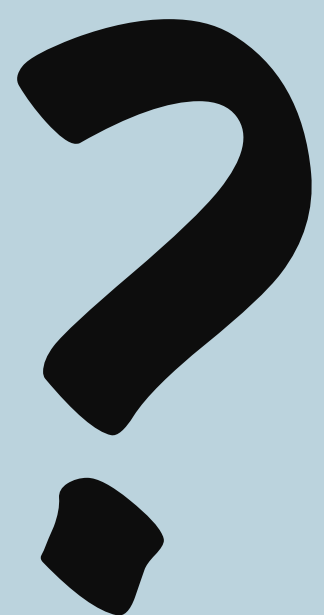


Suppose we have the *context* “I want to _____”. Lots of words can come next and form sensible sentences. Think about a few words that can come next; what do these have in common?



grammatical
but less likely

Language Modeling



Can you think of a *context* (a start of a sentence like “I want to ____” ending in a blank) where the next word **has** to be one word in particular for it to be correct?

The capital of Nebraska is _____ Lincoln

one right answer but
may be hard to predict!

The third President of the United States was _____

Thomas

Jefferson

one of the “founding fathers”

Language Modeling

Q: What started the American Revolution? A: _____

Once upon a time, there was a _____

The translation of “I’d like the Caesar salad, please” into Spanish is “_____”

ChatGPT is a “supercharged” language model! Even though it can only do one thing (predictive text), it has way more diverse capabilities than past systems like Google Translate.

Probabilities

Tomorrow, the weather will be _____

sunny 0.6

cloudy 0.2

rainy 0.2

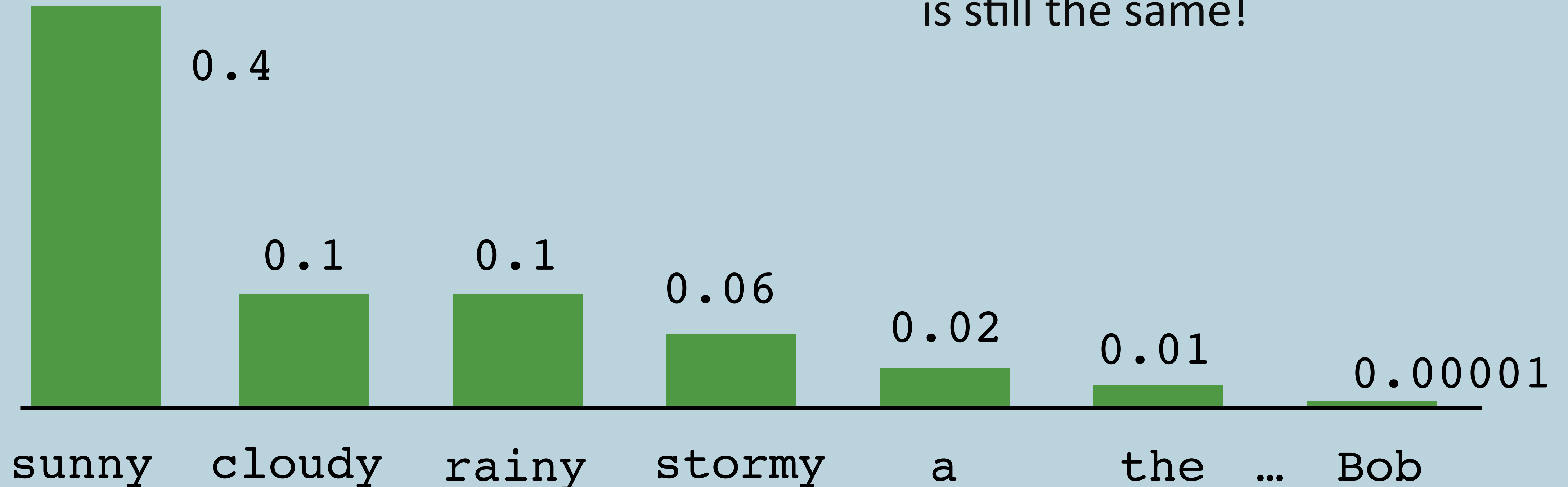
Three options. This is what we call our **vocabulary**.

Language models place a **probability distribution** over the **vocabulary**.

Probabilities

Tomorrow, the weather will be ____

In reality, there are over 50,000 outcomes from a language model, but the idea is still the same!



These language models can give small probabilities, but never give 0!

Probabilities

Once upon a time, there was a brave and noble knight who lived in a small
monsters, showing his courage a

But one day, while on a journey to
and strength more than any batt

The wizard explained that a powe

young = 23.86%

brave = 10.12%

small = 8.36%

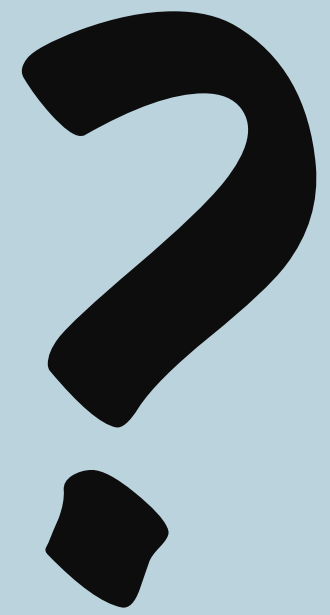
little = 7.25%

princess = 6.89%

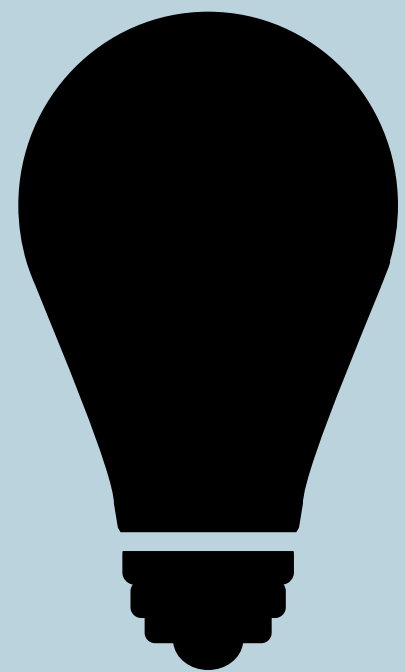
- ▶ In GPT-3 (an earlier system than ChatGPT), you could actually see the probabilities!



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**We'll learn basic principles of
Natural Language Processing (NLP)**