

Programming GPTs



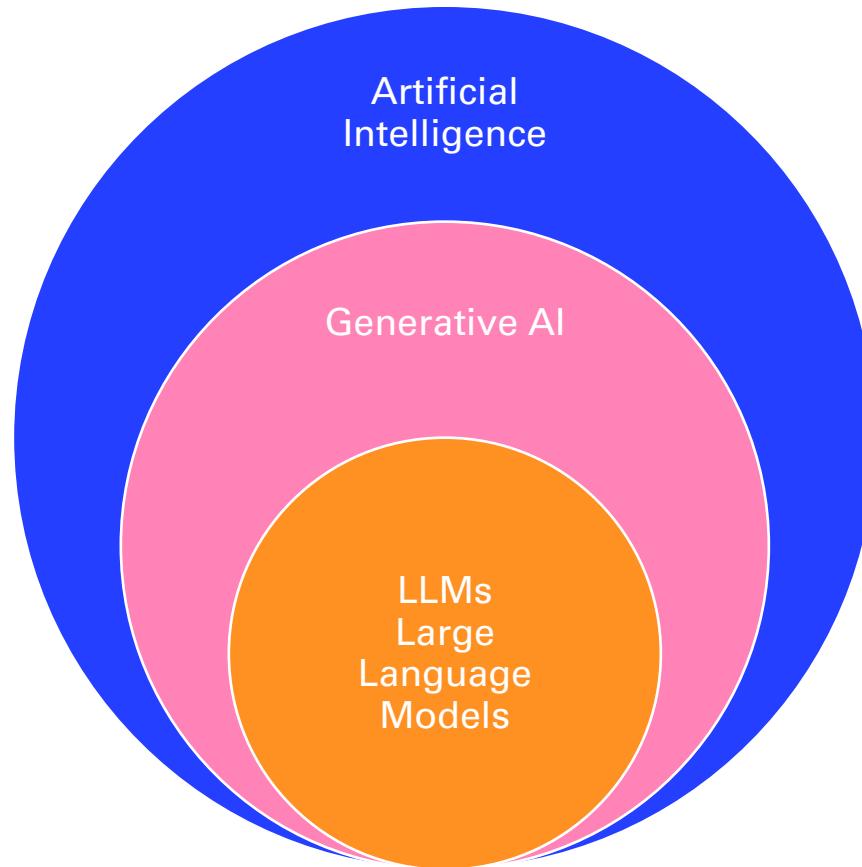
- 
- 1. Introduction to GPTs**
 - 2. ChatGPT APIs**
 - 3. Chaining & Summarization**
 - 4. Vector search & Question Answering**
 - 5. Agents & Tools**
 - 6. Speech-to-Text & Text-to-Speech**
 - 7. Vision**
 - 8. Dall-E image generation**
 - 9. Conclusion**
 - 10. Appendix**

Agenda



GPTs
Generative
Pre-trained
Transformers

Terminology



Large Language Models are next word predictors

in

out

A long time ago in

A long time ago in a

A long time ago in a galaxy

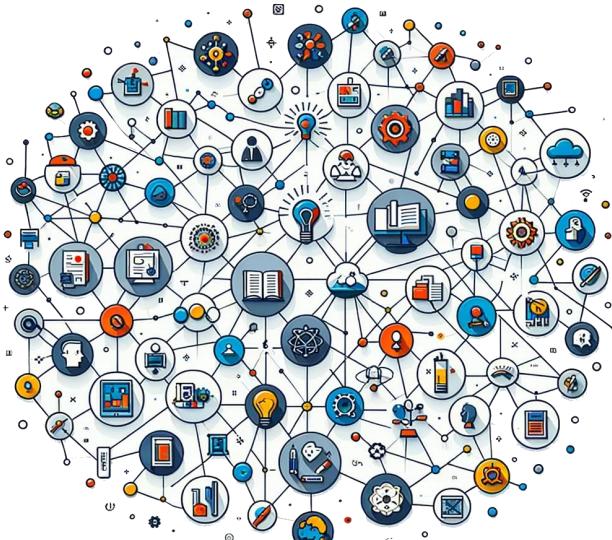
A long time ago in a galaxy far

A long time ago in a galaxy far,

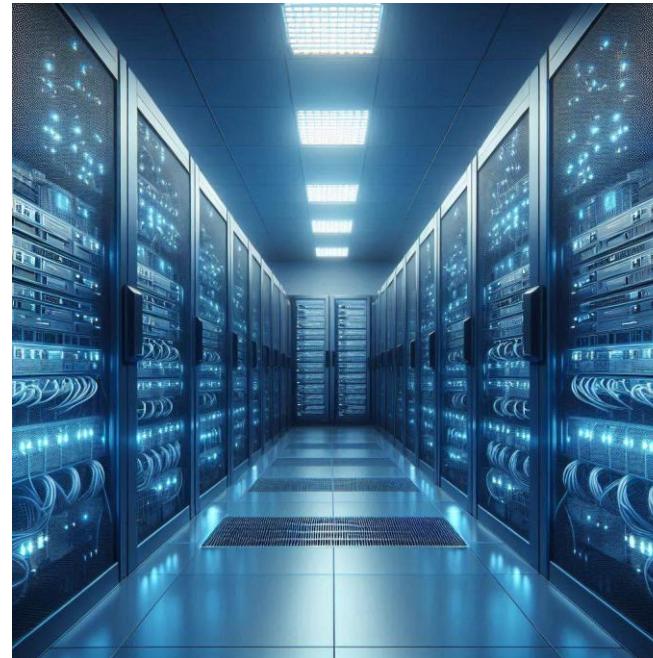
A long time ago in a galaxy far, far

A long time ago in a galaxy far, far away

L in LLM



Chunks of the internet
~10TB of text



6000 GPUs for 12 days
~ \\$2M / ~1e24 FLOPS



parameters.zip

~140GB
file

Generative



Generative models can create new data from existing data.

For example, given an image, a generative model can produce another image that is similar but not identical to the original one.

Similarly, given a text, a generative model can produce another text that is related but not identical to the original one.



Generative vs Discriminative

"Generative" describes a class of statistical models that contrasts with discriminative models.

- **Generative** models can generate new data instances.
- **Discriminative** models discriminate between different kinds of data instances.



a long time ago

written with gpt i

Shuffle initial text

Trigger autocomplete or tab

Select suggestion ↑ ↓ and enter

Cancel suggestion esc

Save & Publish

a long time ago in a galaxy

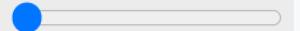
far, far away.

beyond the imagination of any human being.

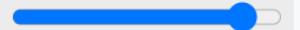
far beyond the galaxy of this world.

Model & decoder settings i

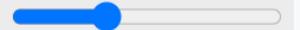
Model size **gpt**



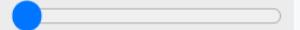
Top-p **0.9**



Temperature **1**

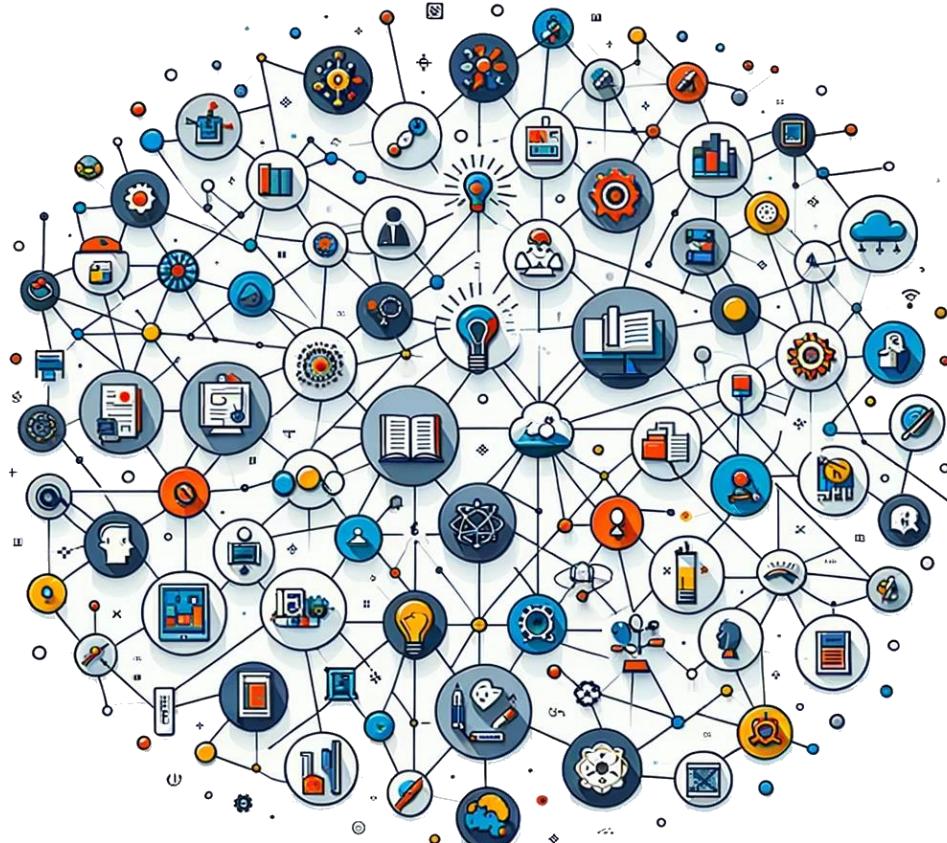


Max time **1**



transformer.huggingface.co

Pre-trained



GPTs have been pre-trained on massive amounts of text from the internet and can produce coherent and diverse responses on almost any topic. They can also perform various tasks, such as answering questions, summarizing texts, generating images, and more.

GPT training pipeline

| | Pretraining | Finetuning |
|---------|--|--|
| Dataset | Raw internet Text trillions of words Low quality, large quantity | Demonstrations Ideal assistant responses, ~10-100K (prompt, response) written by contractors High quality, low quantity |
| Model | Base model | Instruct model |
| Method | Self-supervised next word prediction | Supervised on labeled data |
| Compute | 1000s of GPUs months of training | 1-100 GPUs days of training |

Self-supervised next word prediction

| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

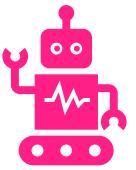
| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

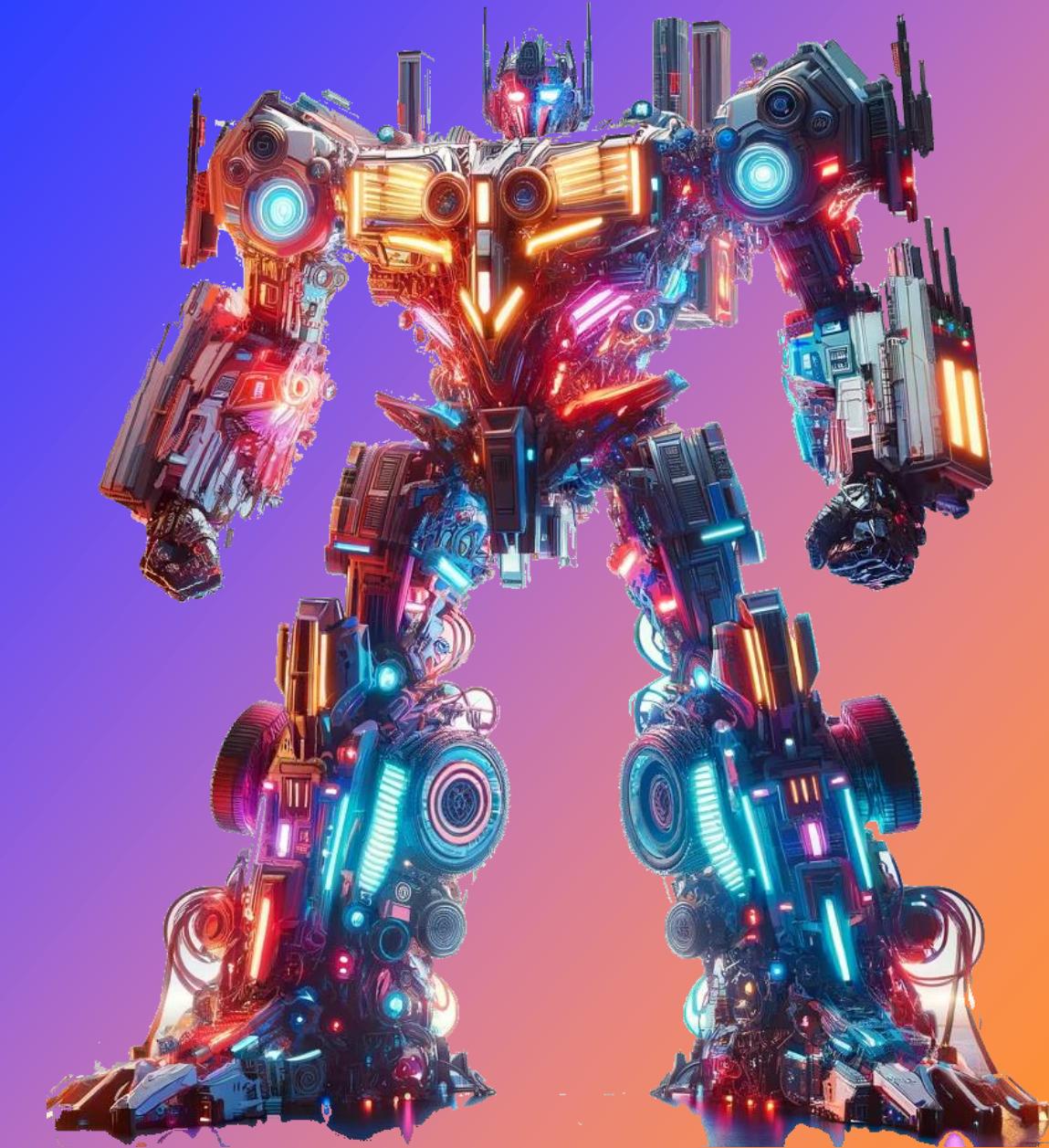
| | | | | | | | | |
|---|------|------|-----|----|---|--------|-----|---|
| a | long | time | ago | in | a | galaxy | far | , |
|---|------|------|-----|----|---|--------|-----|---|

Transformers



A transformer is a neural network that can map any input sequence to any output sequence.

For example, given a sentence in English, a transformer can learn to translate it to French.

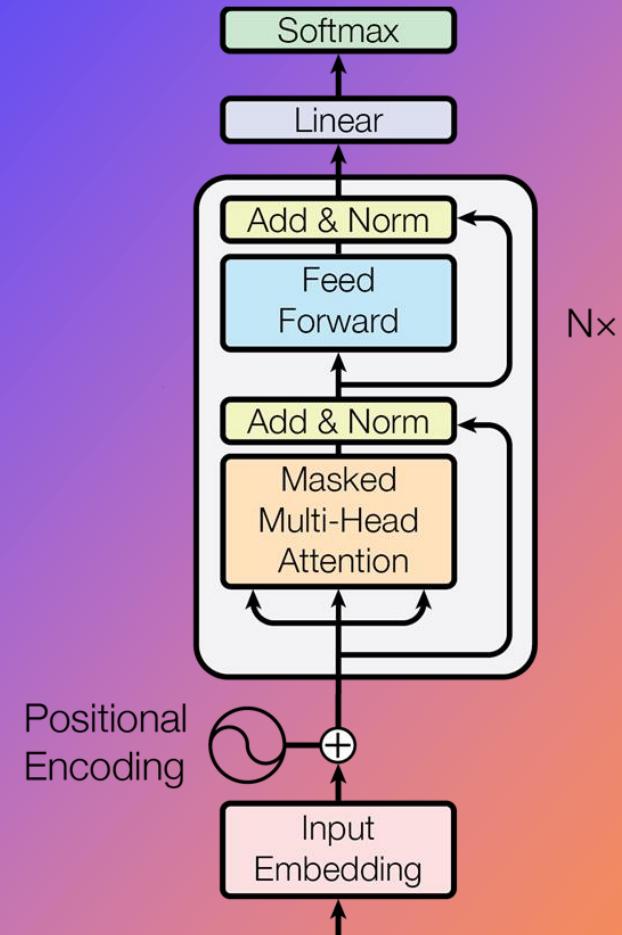


Transformers are general-purpose machines

Expressive: They can model complex relationships and patterns in data

Optimizable: Their ability to handle complexity is not compromised by the fact that they can be trained on large amount of data

Efficient: The training and prediction can be highly parallelized on graphics cards.



Attention

translate in French: Attention is all you need



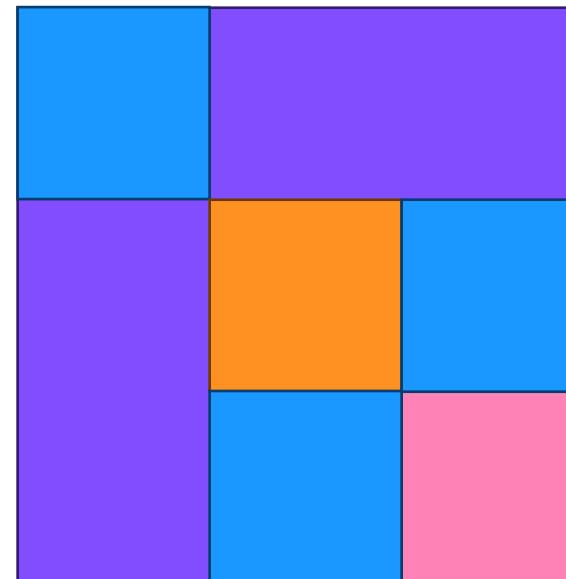
"L'attention est tout ce dont vous avez besoin"

the blue dog

le

chien

bleu

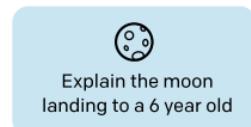


Following instructions

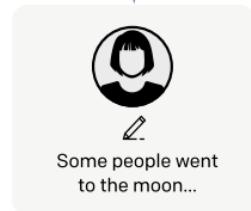
Step 1

Collect demonstration data, and train a supervised policy.

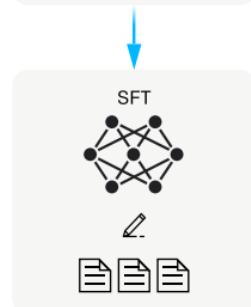
A prompt is sampled from our prompt dataset.



A labeler demonstrates the desired output behavior.



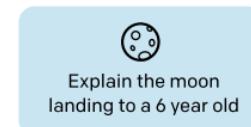
This data is used to fine-tune GPT-3 with supervised learning.



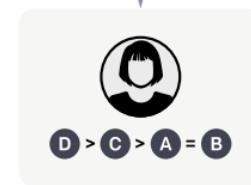
Step 2

Collect comparison data, and train a reward model.

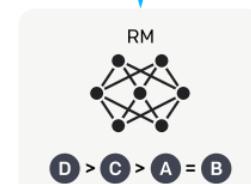
A prompt and several model outputs are sampled.



A labeler ranks the outputs from best to worst.



This data is used to train our reward model.



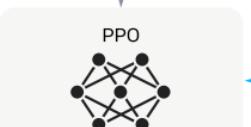
Step 3

Optimize a policy against the reward model using reinforcement learning.

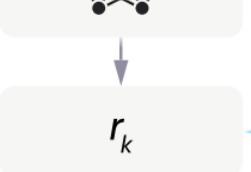
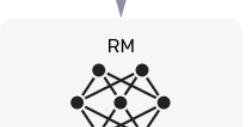
A new prompt is sampled from the dataset.



The policy generates an output.



The reward model calculates a reward for the output.

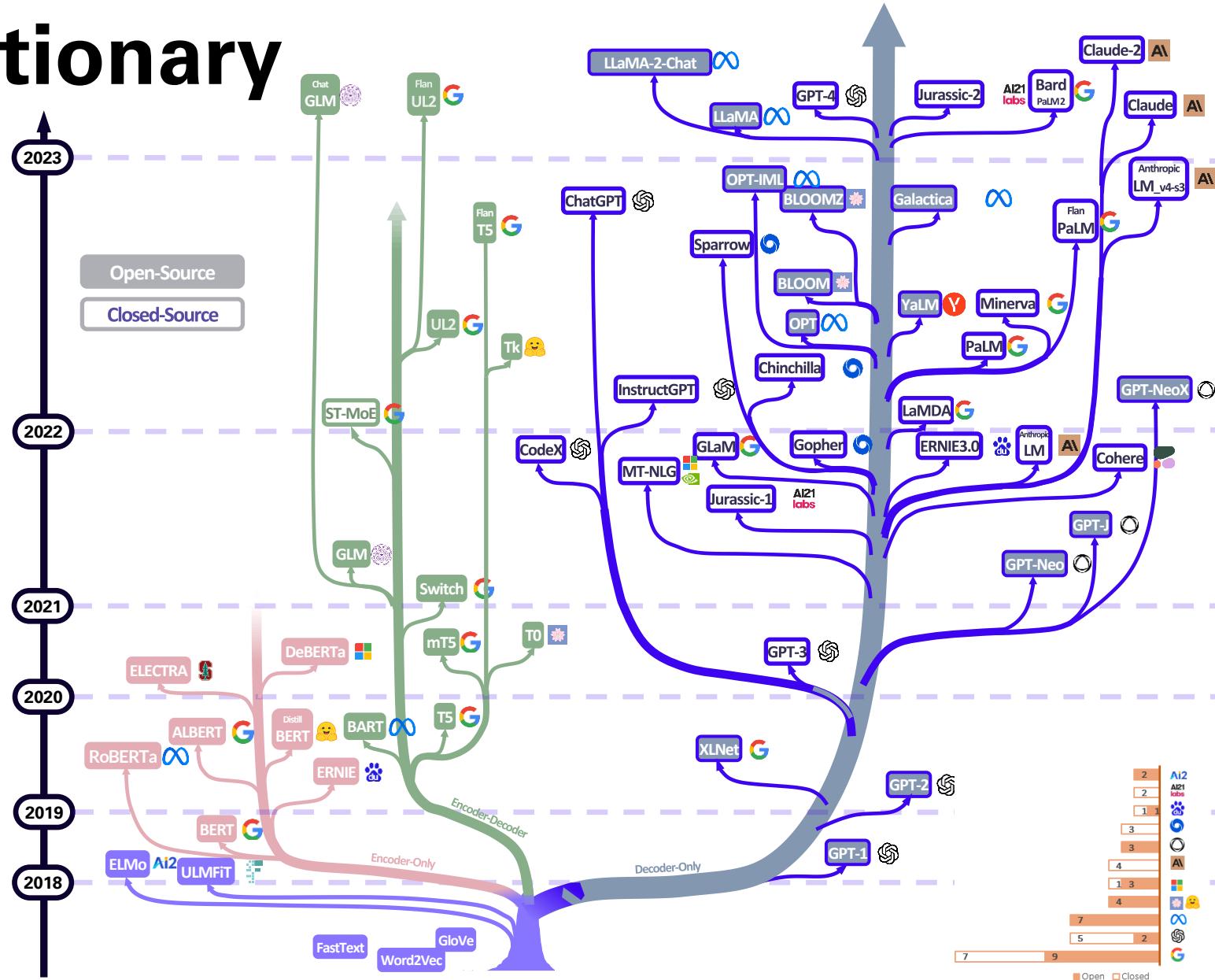


The reward is used to update the policy using PPO.

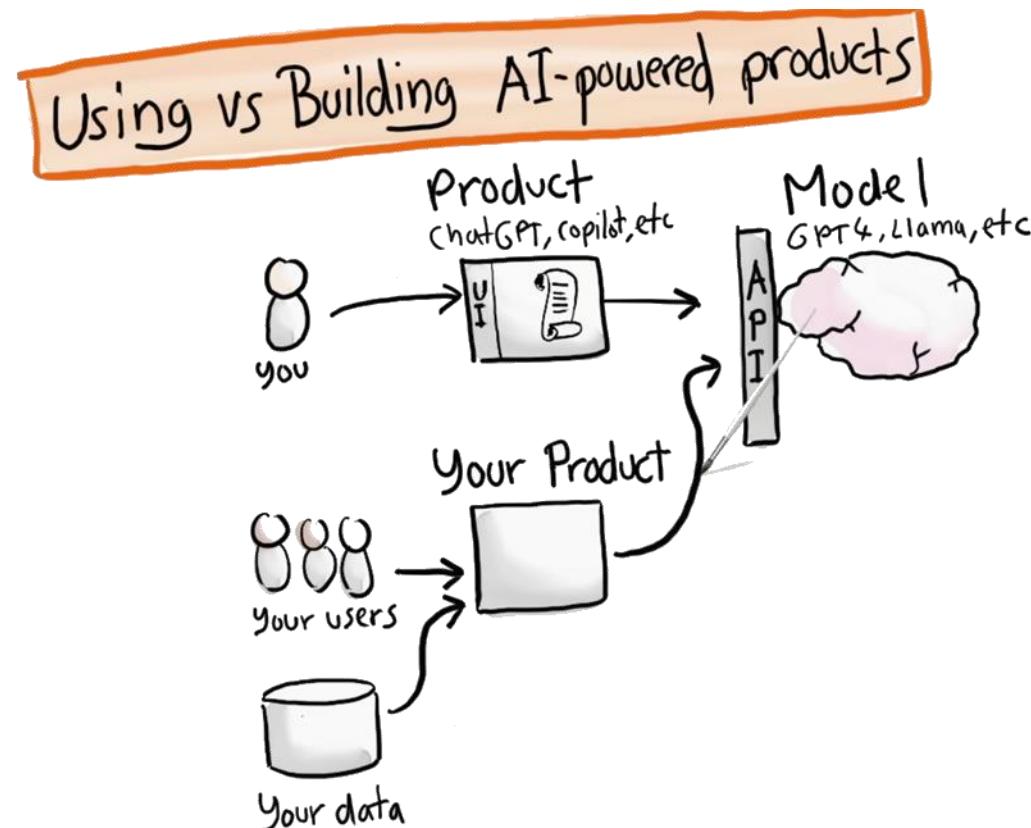
LLM Evolutionary Tree



2023



Using vs Building AI-powered products



[Video: Generative AI in a nutshell](#)

ChatGPT APIs



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Quick tour of OpenAI developer platform

The screenshot shows the OpenAI developer platform interface. On the left, there's a sidebar with options: PLAYGROUND, Chat (which is selected), Assistants, TTS, Completions, and Forum. The main area is titled "Chat" and shows a model selection dropdown with "gpt-4o" and a "Compare" button. Below it is a "SYSTEM" section with a text input field "Enter system instructions". At the bottom, there's a message input field "Enter user message..." with "User" and "File" buttons, and "Add" and "Run Ctrl" buttons. To the right, there are "Presets" and "Save" buttons, along with icons for upload, download, and refresh. A "Functions" section includes a "+ Add function" button and sliders for "Temperature" (set to 1), "Maximum Tokens" (set to 256), "Stop sequences" (with an input field), "Top P" (set to 1), "Frequency penalty" (set to 0), "Presence penalty" (set to 0), and a note stating that API and Playground requests will not be used to train models.

PLAYGROUND

Chat

gpt-4o

Compare

SYSTEM

Enter system instructions

Enter user message...

User File

Add Run Ctrl

Presets

Save

FUNCTIONS

+ Add function

Temperature 1

Maximum Tokens 256

Stop sequences
Enter sequence and press Tab

Top P 1

Frequency penalty 0

Presence penalty 0

API and Playground requests will not be used to train our models. [Learn more](#)



Playground

Your presets

Save

[View code](#)

Share

• • •

A long time ago in a galaxy far away... there was a peace which had reigned for centuries. Since the establishment of the Galactic Republic, the galaxy has been in relative harmony under its rule. However, the galaxy was about to face a new era of peace and challenge.

Deep in the Unknown Regions of the Multiverse, the Celestials had been watching the galaxy for eons and had decided to make a move. ,n = 3.45%
 ,n = 1.64%

The Celestials were masters of the ways that no other beings could. They saw fit, but now they feared that they had been reckless. They believed that if they destroyed the Asgardians, they would be taking away the galaxy's most powerful being. The Celestials wanted to control the galaxy as they saw fit, but they did not realize that they were becoming too powerful and that they were about to bring about their own destruction.

In order to prevent this, the Celestials shared their fears and concerns. These were the Sith, who had been in hiding since their defeat during the Great Hyperspace War. The Celestials knew that the Sith possessed a

 Completion models are now considered legacy. [Try our latest models](#) 

X

Submit



272

inject start text

Model

gpt-3.5-turbo-instruct ◊

Temperature 1

Maximum length 256

Stop sequences

Top P

Frequency penalty

Presence penalty 0

Best of 1

Inject start text

Prompt examples



Grammar correction

Convert ungrammatical statements into standard English.



Parse unstructured data

Create tables from unstructured text.



Calculate time complexity

Find the time complexity of a function.



Keywords

Extract keywords from a block of text.



Python bug fixer

Find and fix bugs in source code.



Tweet classifier

Detect sentiment in a tweet.



Summarize for a 2nd grader

Simplify text to a level appropriate for a second-grade student.



Emoji Translation

Translate regular text into emoji text.



Explain code

Explain a complicated piece of code.



Product name generator

Generate product names from a description and seed words.



Spreadsheet creator

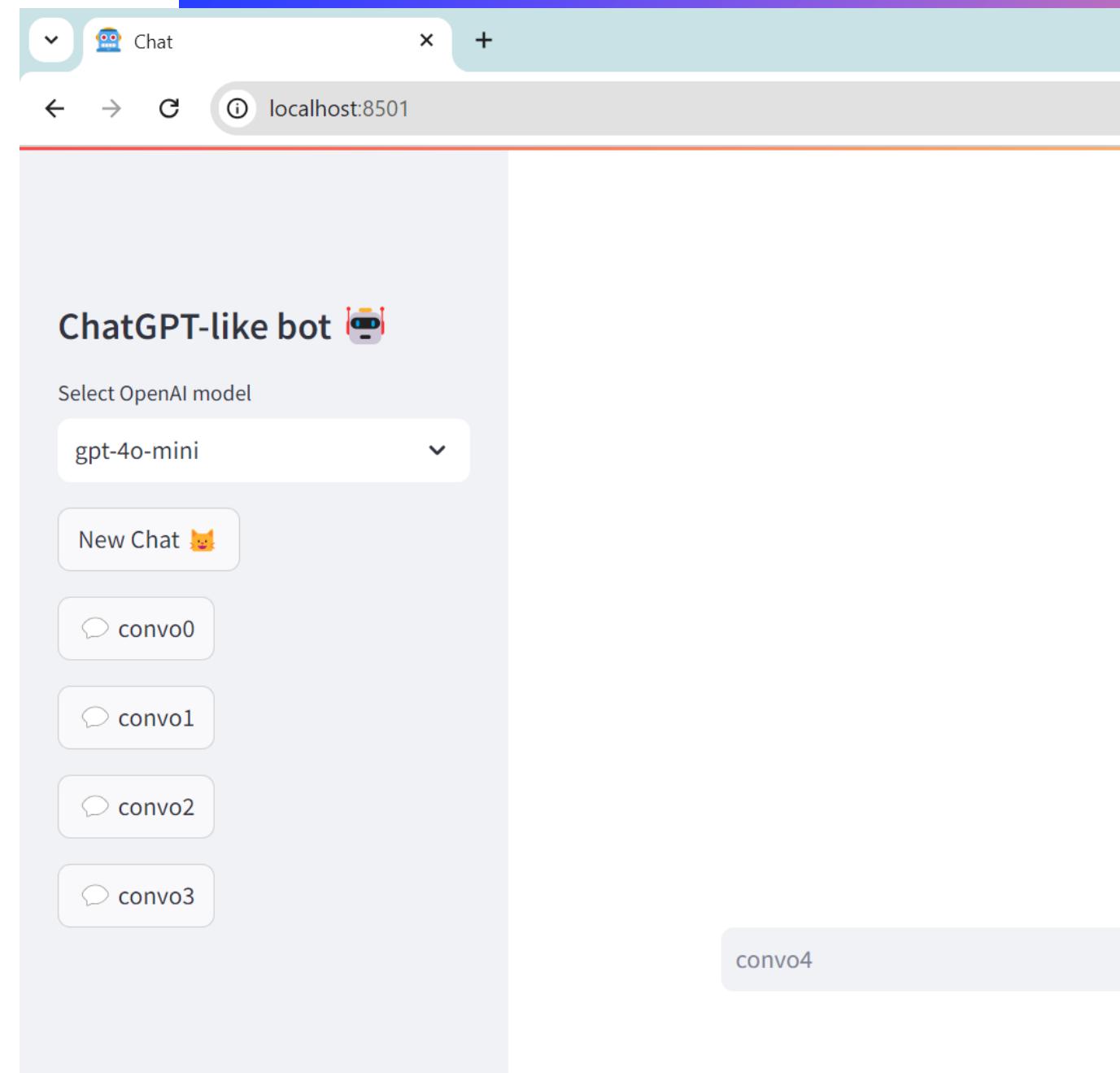
Create spreadsheets of various kinds of data.



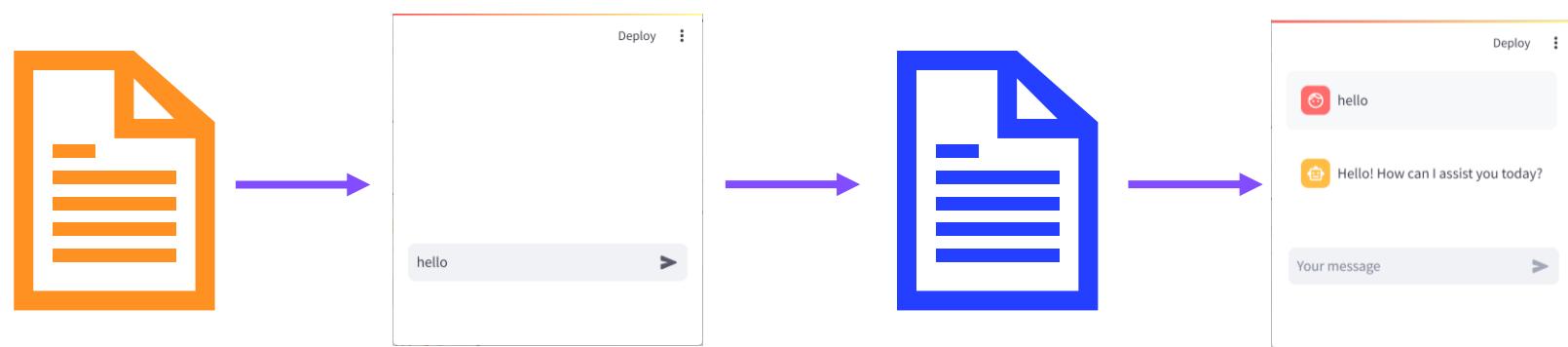
Airport code extractor

Extract airport codes from text.

Your first chatbot



Streamlit execution model



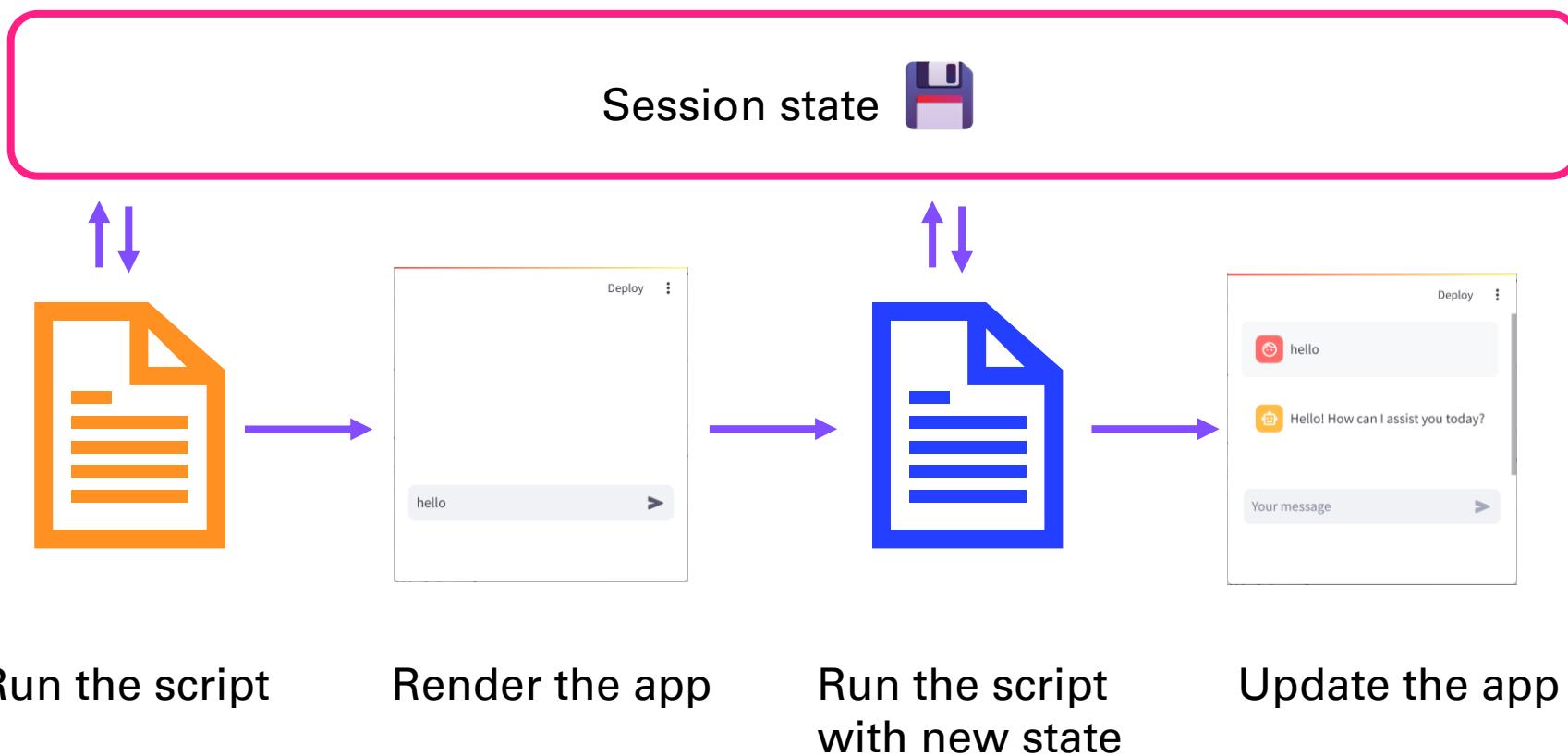
Run the script

Render the app

Run the script
with new state

Update the app

Streamlit session state

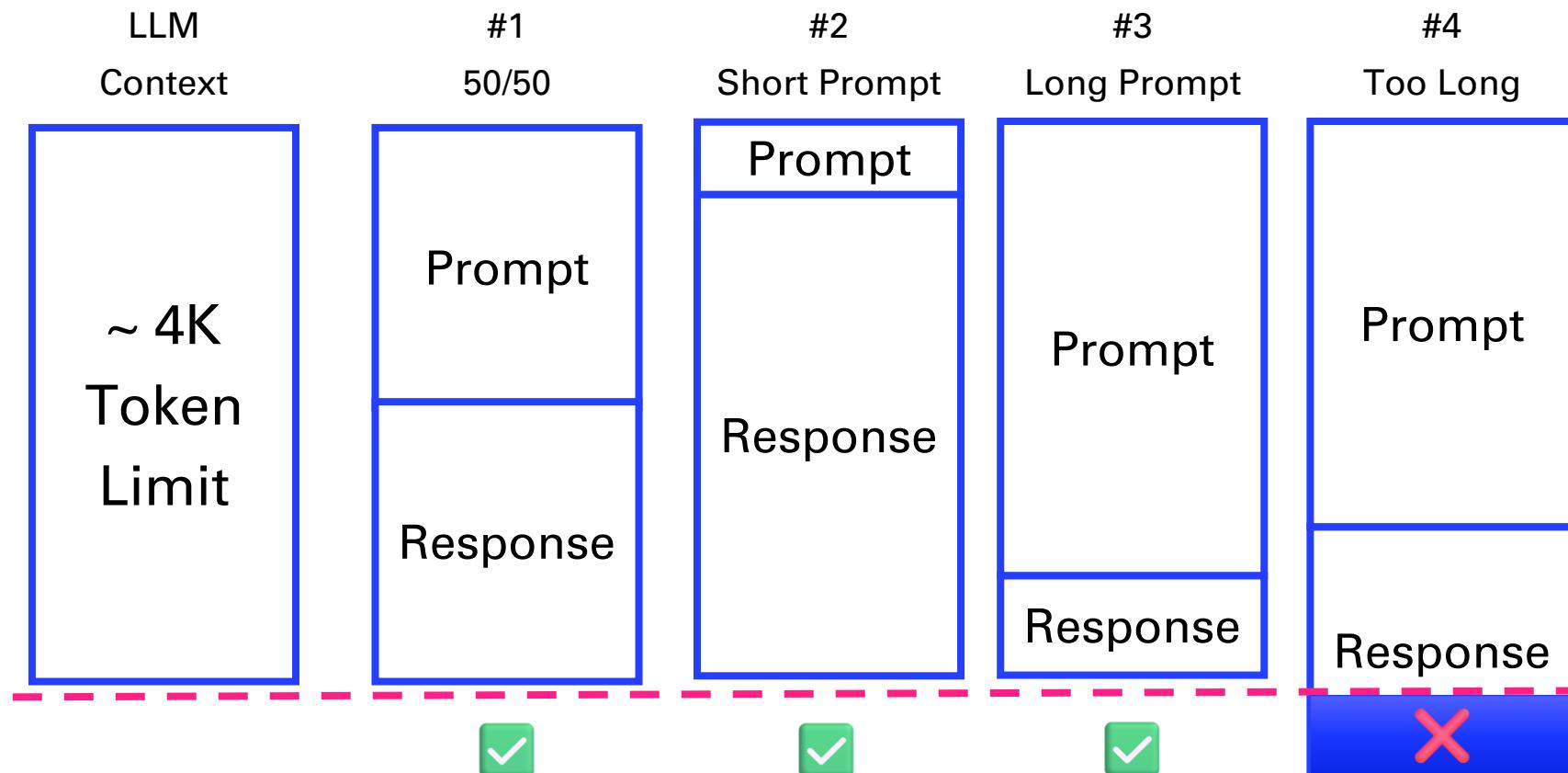


Chaining



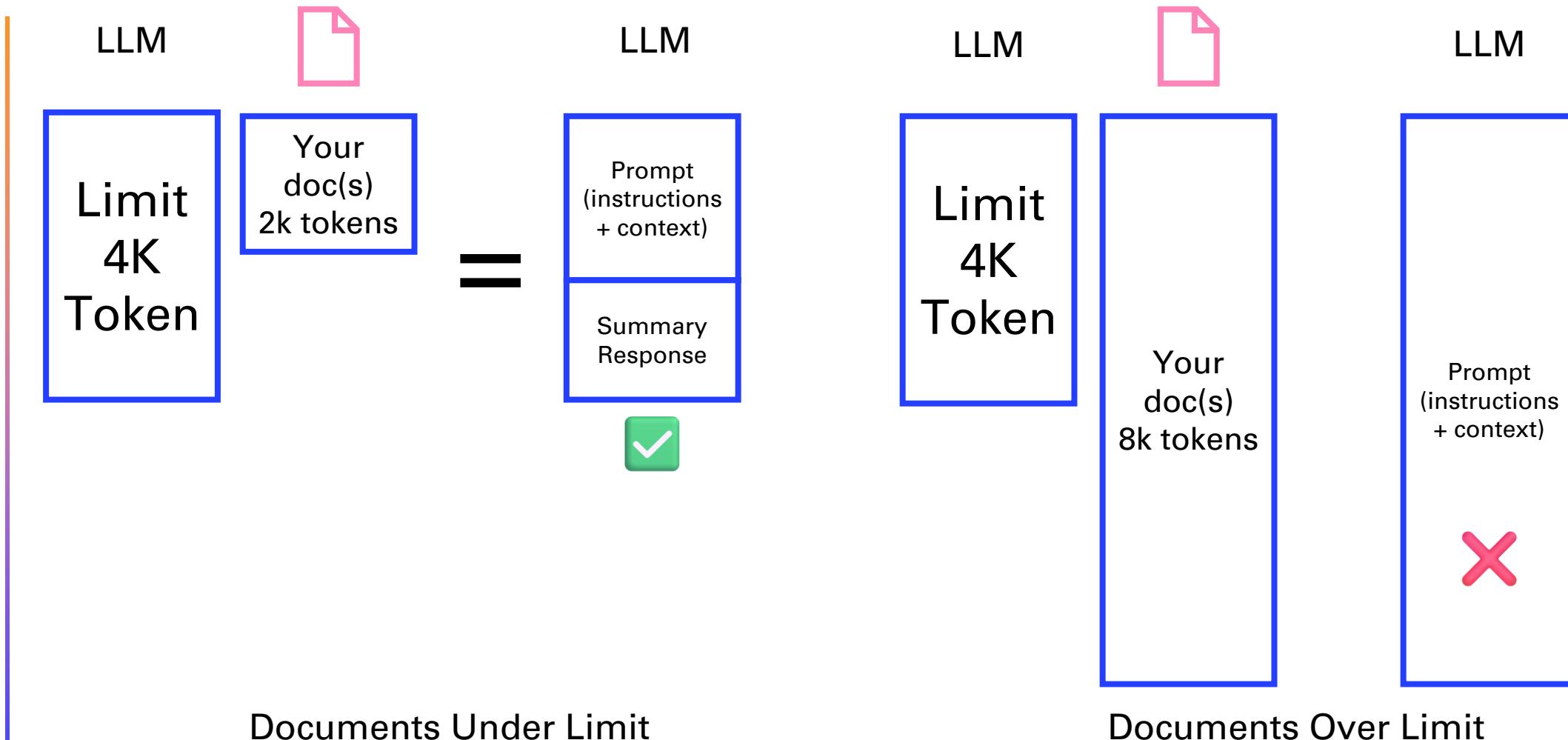
+
o .

Context length (ex. with 4K token limit)



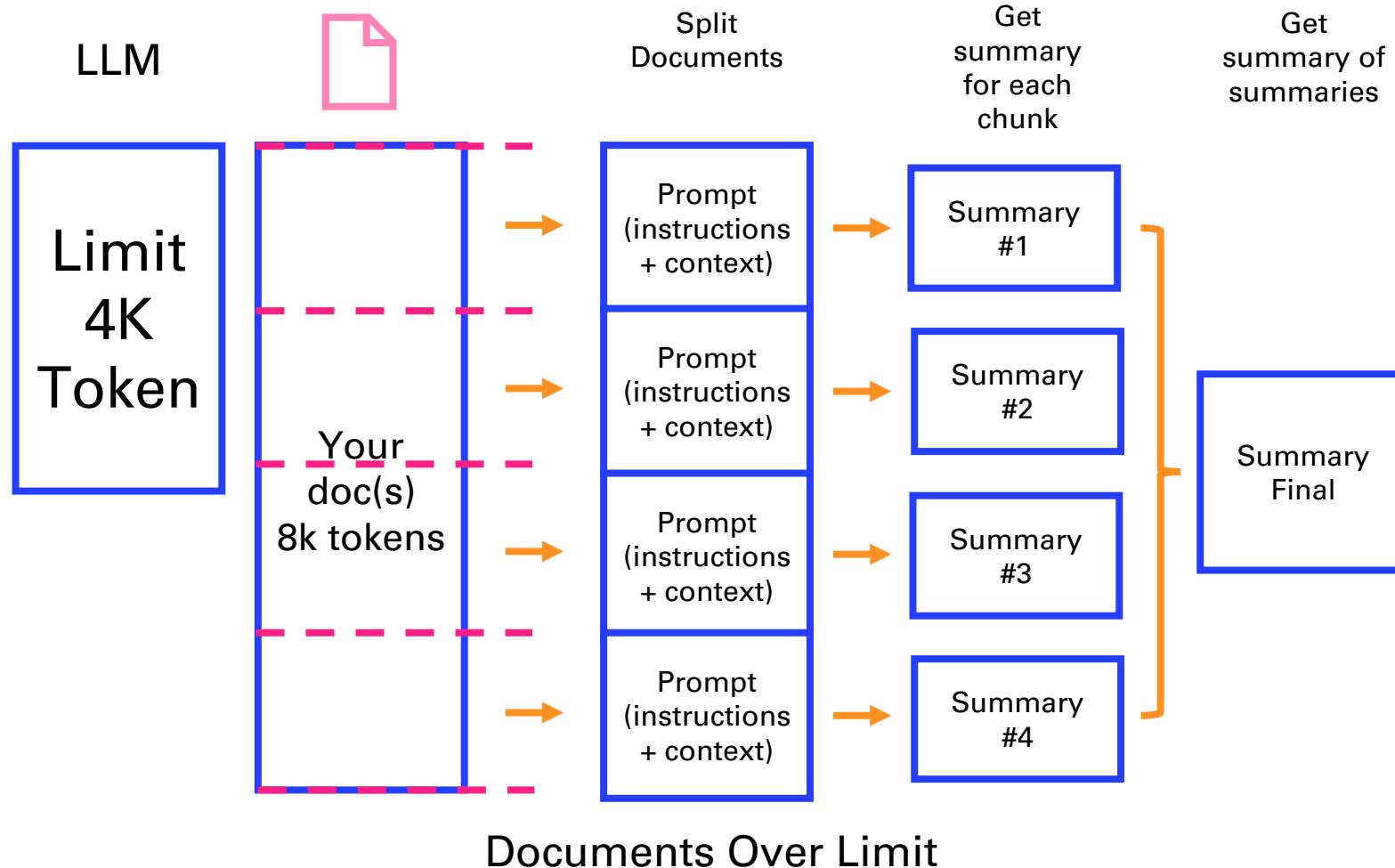
Summarizing: Stuffing

Pros: 1 API Call, All data at once
Cons: Limited Context Length



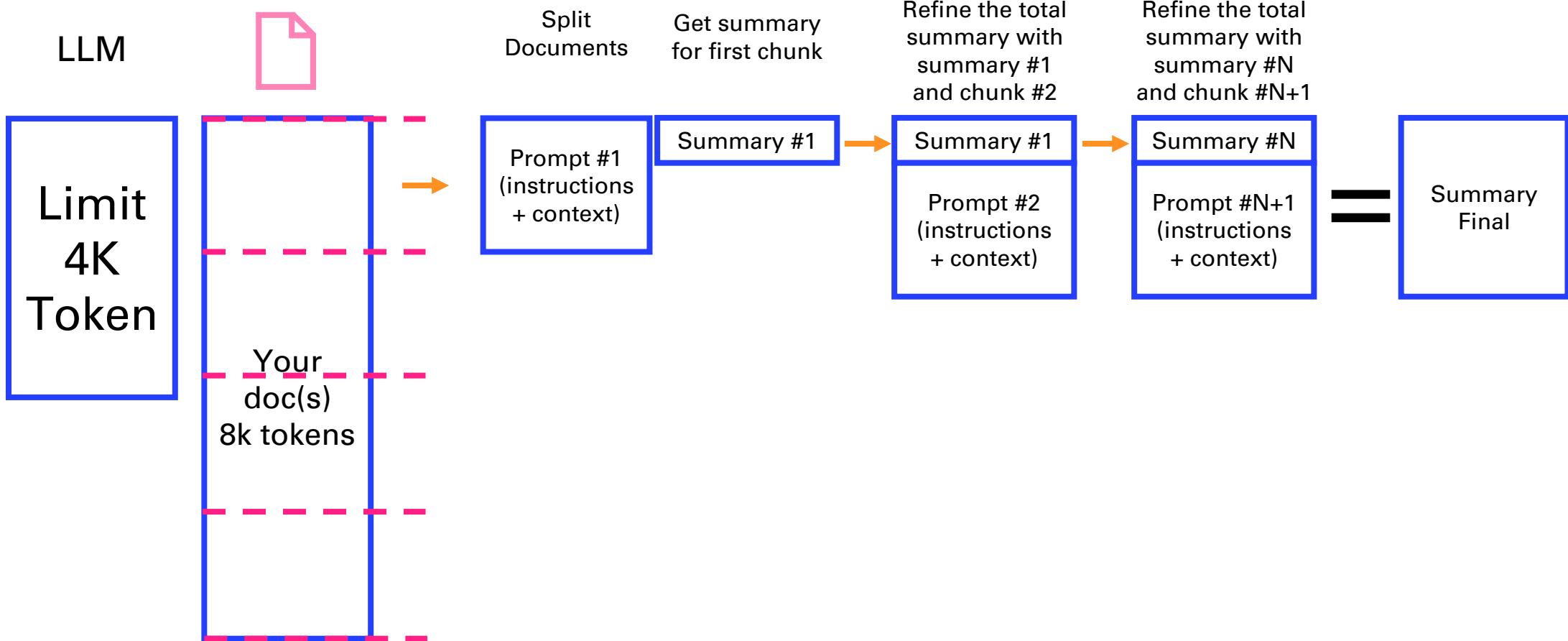
Summarizing: Map Reduce

Pros: Scales to larger docs,
can be parallelized
Cons: Maybe API Calls. Loses
information



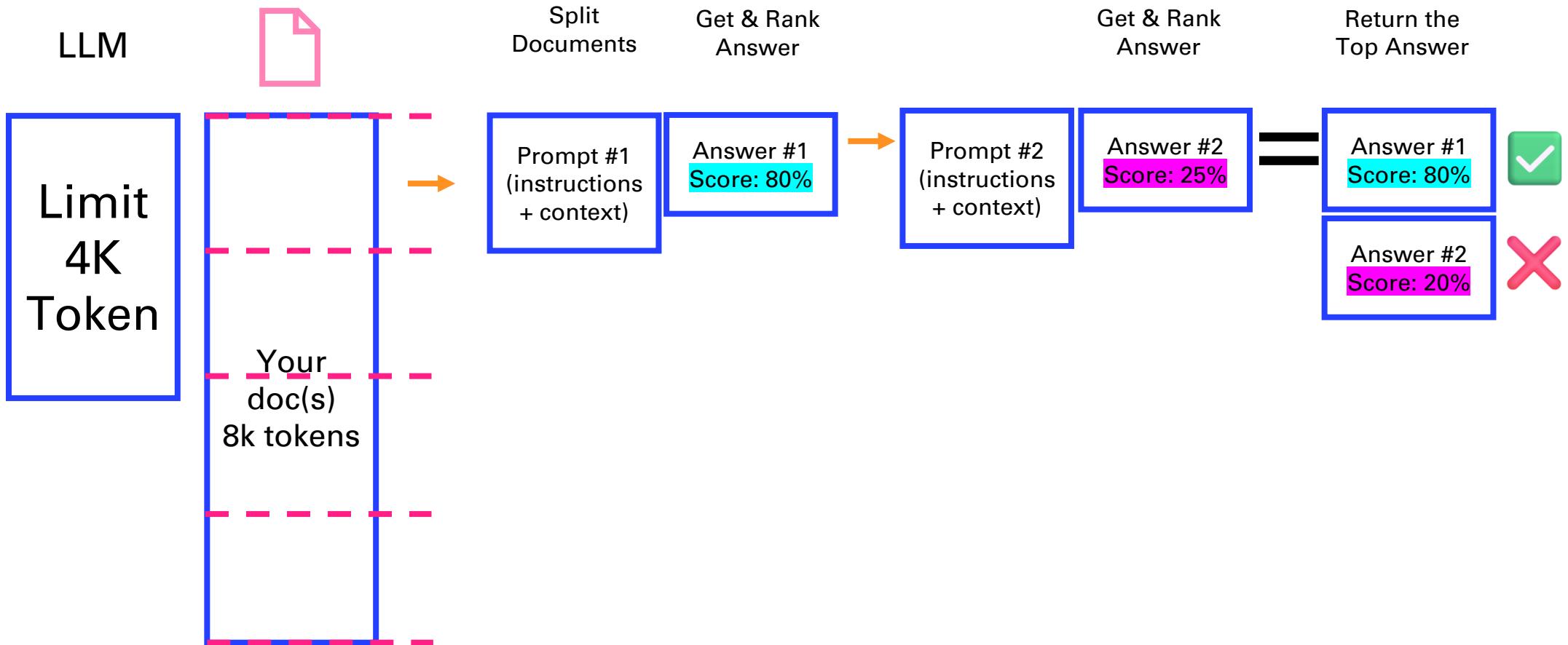
Summarizing: Refine

Pros: More relevant context
Cons: Many *independent* calls



Q&A: Map Rerank

Pros: Scales well, better for single-answer questions
Cons: Cannot combine information between docs





Vector search & Question Answering



Tokenization

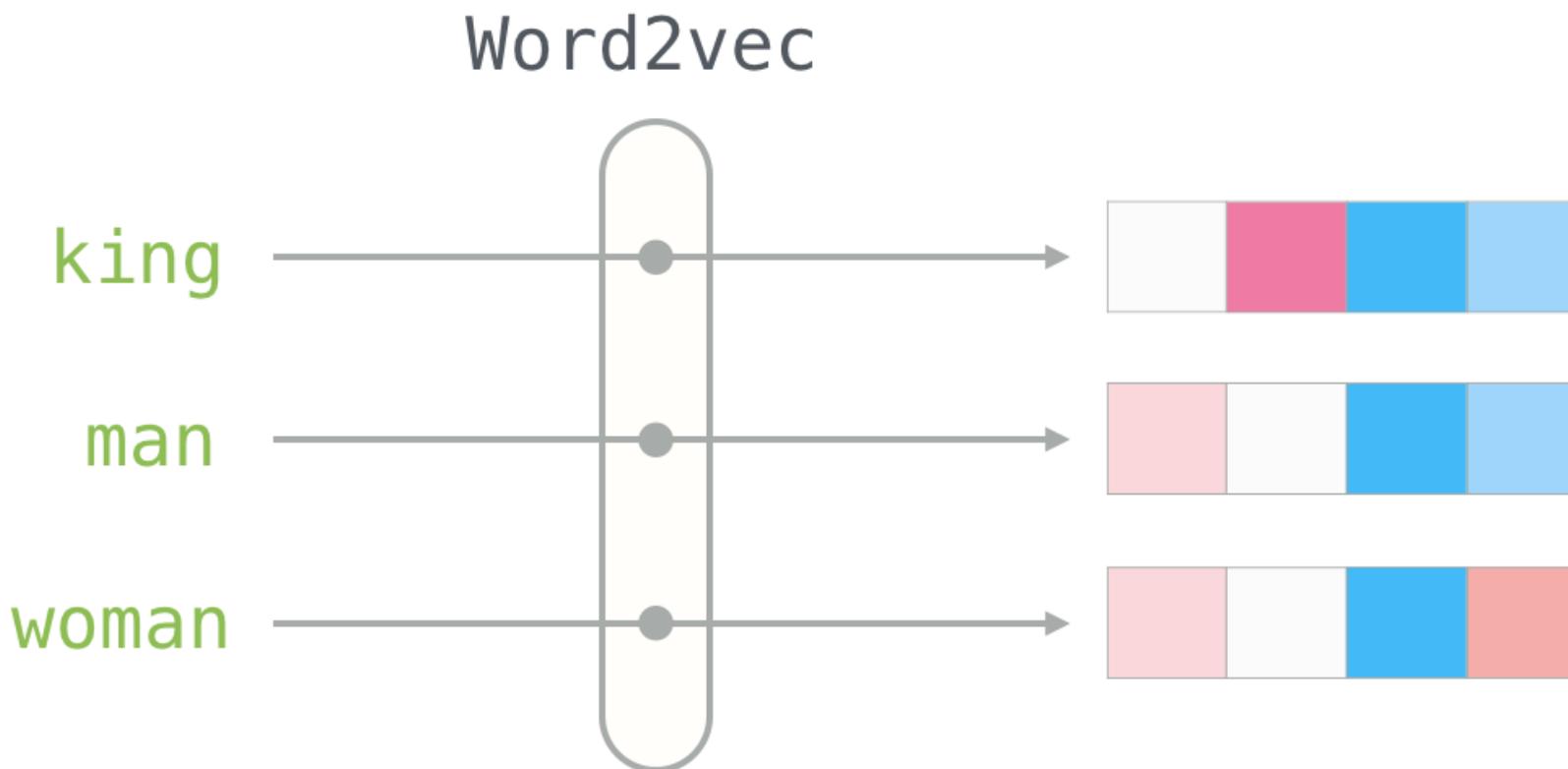
| Tokens | Characters |
|--------|------------|
| 9 | 32 |

A long time ago in a galaxy far,

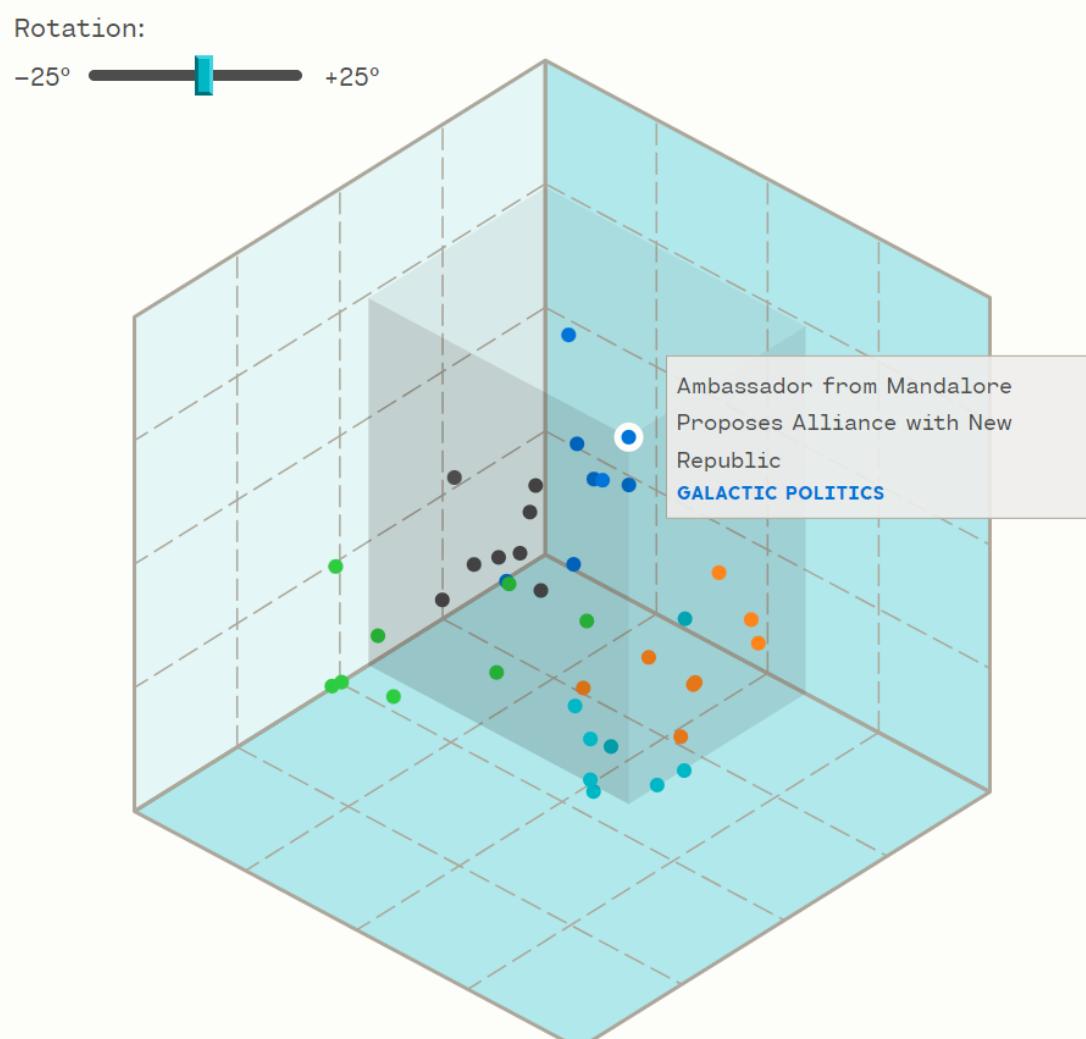
Text

Token IDs

From Word to Vectors



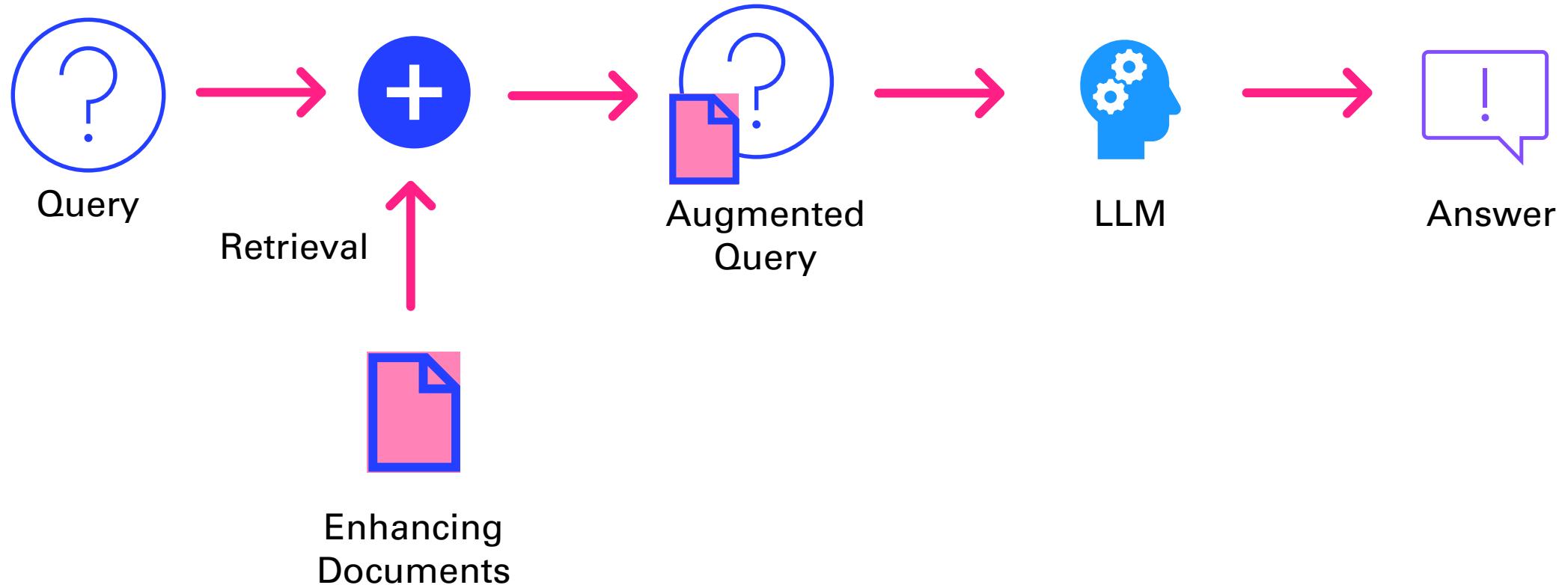
<https://jalammar.github.io/illustrated-word2vec/>



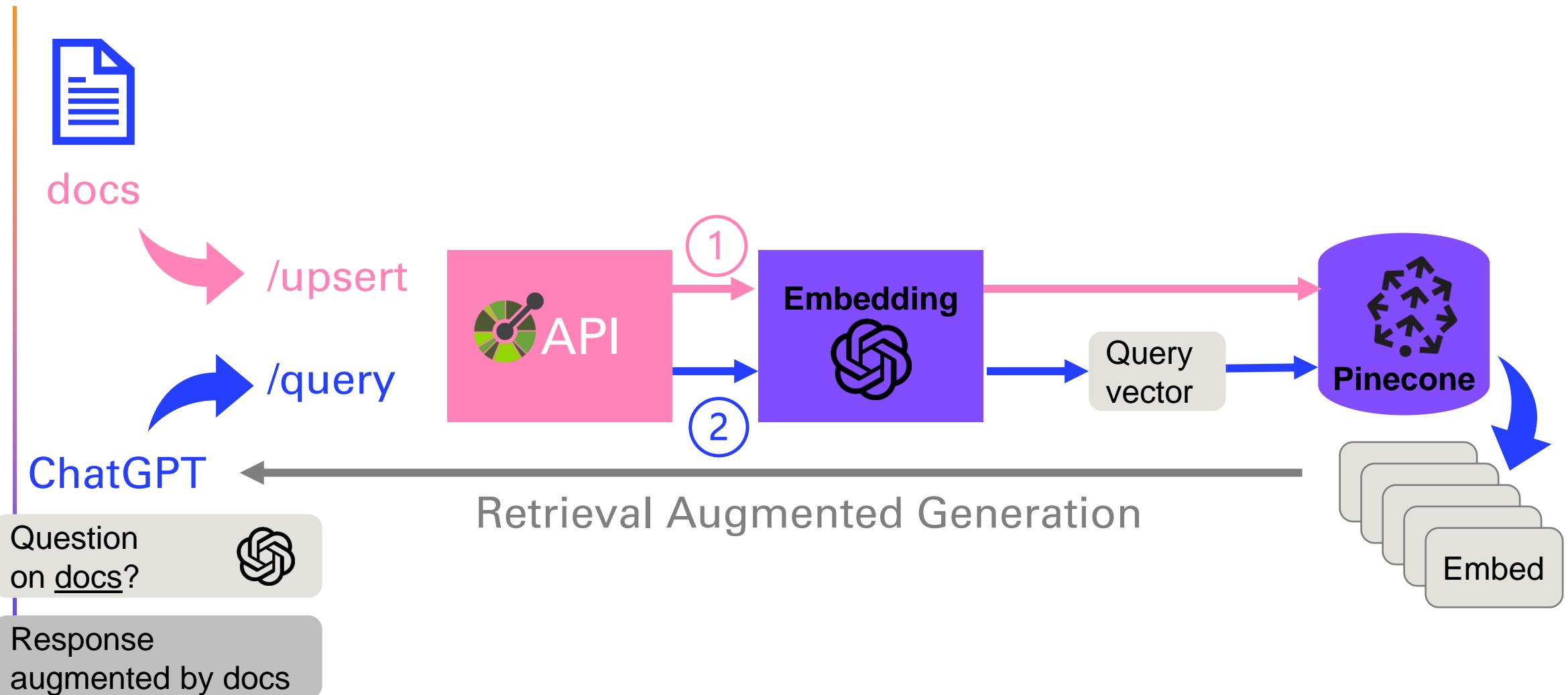
Embeddings

Dense vectors representing the semantic meaning of textual information

Retrieval Augmented Generation



Retrieval Plugin Architecture



<https://github.com/openai/chatgpt-retrieval-plugin>



Question Answering on Book

Impromptu

Query

what is the potential of AI in education?

Answer

AI has the potential to become a powerful tool in education, transforming the way we learn and deliver instruction. It can provide personalized and individualized learning experiences tailored to each student's needs and interests. AI can also identify the topics and skills that students need to focus on and provide guidance and support as needed. Additionally, AI-driven tools can automate and streamline mundane aspects of teaching, such as grading and content creation, allowing teachers to have more time to engage and inspire their students. However, the full potential of AI in education may be limited by factors such as cost, access, and privacy concerns.

Sources:

www.impromptubook.com

Impromptu

Amplifying Our Humanity
Through AI

By Reid Hoffman
with GPT-4





Agents & tools



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2 main papers on Agents

[\[2210.03629\] ReAct: Synergizing Reasoning and Acting in Language Models \(arxiv.org\)](#)

Published as a conference paper at ICLR 2023

REACT: SYNERGIZING REASONING AND ACTING IN LANGUAGE MODELS

Shunyu Yao^{*1}, Jeffrey Zhao², Dian Yu², Nan Du², Izhak Shafran², Karthik Narasimhan¹, Yuan Cao²

¹Department of Computer Science, Princeton University

²Google Research, Brain team

¹{shunuy, karthikn}@princeton.edu

²{jeffreyzhao, dianyu, dunan, izhak, yuancao}@google.com

ABSTRACT

While large language models (LLMs) have demonstrated impressive performance across tasks in language understanding and interactive decision making, their abilities for reasoning (e.g. chain-of-thought prompting) and acting (e.g. action plan generation) have primarily been studied as separate topics. In this paper, we explore the use of LLMs to generate both reasoning traces and task-specific actions in an interleaved manner, allowing for greater synergy between the two: reasoning traces help the model induce, track, and update action plans as well as handle exceptions, while actions allow it to interface with and gather additional information from external sources such as knowledge bases or environments. We apply our approach, named ReAct, to a diverse set of language and decision making tasks and demonstrate its effectiveness over state-of-the-art baselines in addition to improved human interpretability and trustworthiness. Concretely, on question answering (HotpotQA) and fact verification (Fever), ReAct overcomes prevalent issues of hallucination and error propagation in chain-of-thought reasoning by interacting with a simple Wikipedia API, and generating human-like task-solving trajectories that are more interpretable than baselines without reasoning traces. Furthermore, on two interactive decision making benchmarks (ALFWORLD and WebShop), ReAct outperforms imitation and reinforcement learning methods by an absolute success rate of 34% and 10% respectively, while being prompted with only one or two in-context examples.

[\[2205.00445\] MRKL Systems: A modular, neuro-symbolic architecture that combines large language models, external knowledge sources and discrete reasoning \(arxiv.org\)](#)

MRKL Systems

A modular, neuro-symbolic architecture that combines large language models, external knowledge sources and discrete reasoning

Ehud Karpas, Omri Abend, Yonatan Belinkov, Barak Lenz, Opher Lieber, Nir Ratner, Yoav Shoham, Hofit Bata, Yoav Levine, Kevin Leyton-Brown, Dor Muhlgay, Noam Rozen, Erez Schwartz, Gal Shachaf, Shai Shalev-Shwartz, Amnon Shashua, Moshe Tenenholz

AI21 Labs

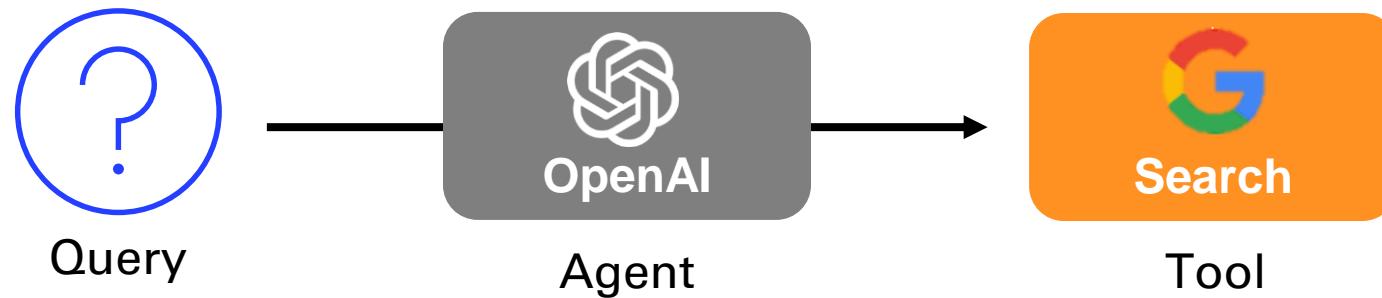
May 3, 2022

Abstract

Huge language models (LMs) have ushered in a new era for AI, serving as a gateway to natural-language-based knowledge tasks. Although an essential element of modern AI, LMs are also inherently limited in a number of ways. We discuss these limitations and how they can be avoided by adopting a systems approach. Conceptualizing the challenge as one that involves knowledge and reasoning in addition to linguistic processing, we define a flexible architecture with multiple neural models, complemented by discrete knowledge and reasoning modules. We describe this neuro-symbolic architecture, dubbed the Modular Reasoning, Knowledge and Language (MRKL, pronounced “miracle”) system, some of the technical challenges in implementing it, and Jurassic-X, AI21 Labs’ MRKL system implementation.

Agents select Tools

- Based on a given query, agents can select tools





Query



Agent



Answer



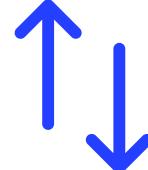
Tool 1

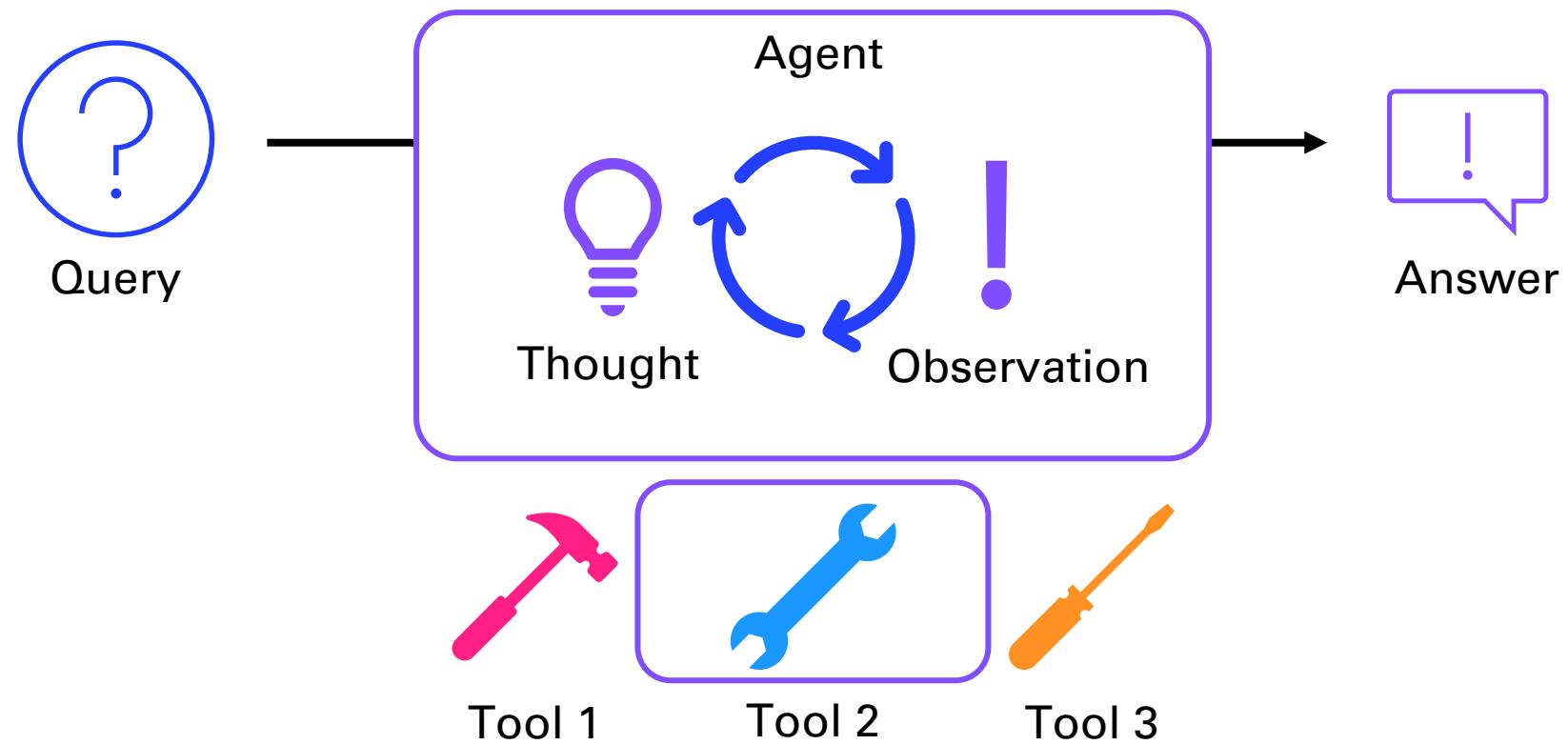


Tool 2



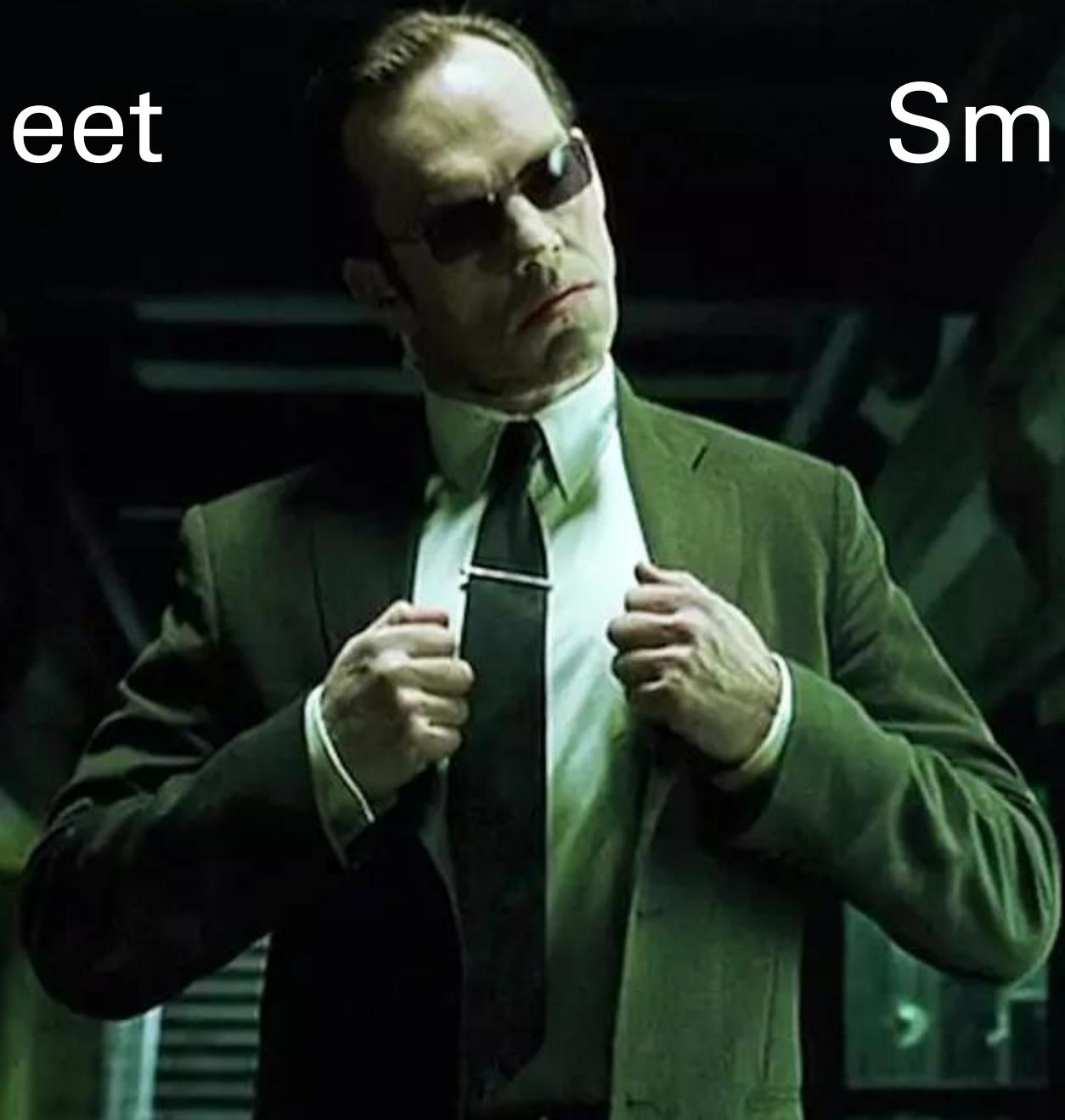
Tool 3





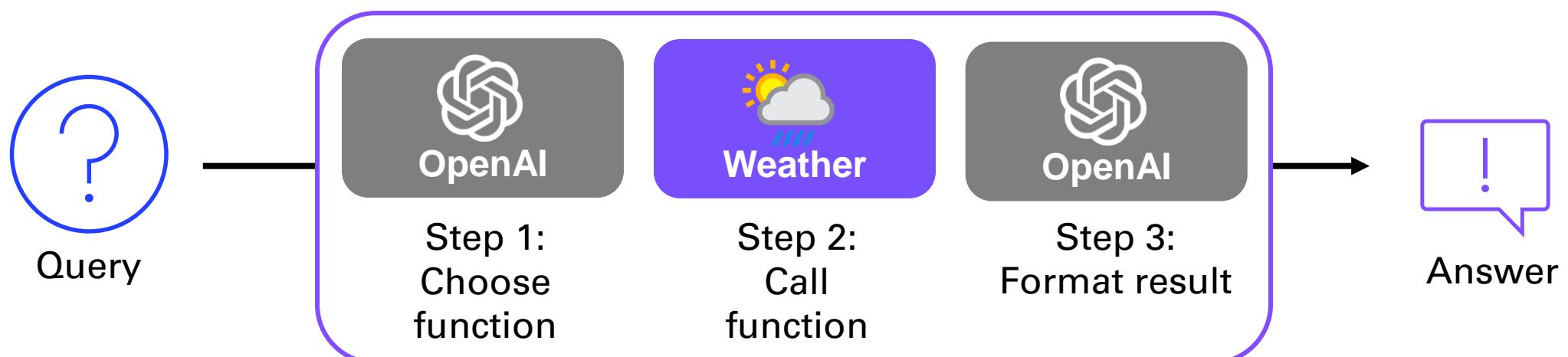
Meet

Smith



Function Calling

- Based on a given query, consecutive calls to the AI and the function construct the answer



Function Calling

- Developers can now describe functions to gpt-4 and gpt-3.5-turbo, and have the model intelligently choose to output a JSON object containing arguments to call those functions. This is a new way to more reliably connect GPT's capabilities with external tools and APIs.
- These models have been fine-tuned to both detect when a function needs to be called (depending on the user's input) and to respond with JSON that adheres to the function signature. Function calling allows developers to more reliably get structured data back from the model.

Function Calling (2)

- Create chatbots that answer questions by calling external tools:
 - Convert queries such as “Email Anya to see if she wants to get coffee next Friday” to a function call like `send_email(to: string, body: string)`,
or
 - “What’s the weather like in Boston?”
`to get_current_weather(location: string, unit: 'celsius' | 'fahrenheit')`.

Function Calling (3)

- Convert natural language into API calls or database queries
 - Convert “Who are my top ten customers this month?” to an internal API call such

```
as get_customers_by_revenue(start_date: string,  
end_date: string, limit: int),
```

or
 - “How many orders did Acme, Inc. place last month?” to a SQL query using `sql_query(query: string)`.

Function Calling (4)

- Extract structured data from text
 - Define a function called `extract_people_data(people: [{name: string, birthday: string, location: string}])`, to extract all people mentioned in a Wikipedia article.

Function Calling (5)

- These use cases are enabled by new API parameters in our /v1/chat/completions endpoint, functions and function_call, that allow developers to describe functions to the model via JSON Schema, and optionally ask it to call a specific function. Get started with our [developer documentation](#) and [add evals](#) if you find cases where function calling could be improved

Function calling example



What's the weather like in Boston right now?

Step 1 · [OpenAI API](#)

Call the model with functions and the user's input



Step 2 · [Third party API](#)

Use the model response to call your API



Step 3 · [OpenAI API](#)

Send the response back to the model to summarize

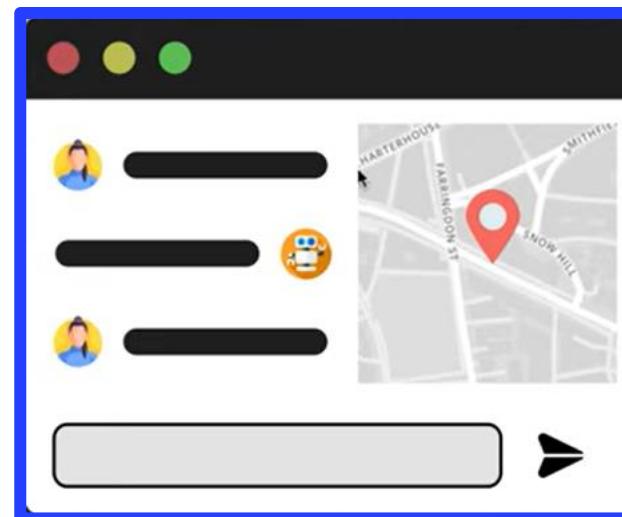
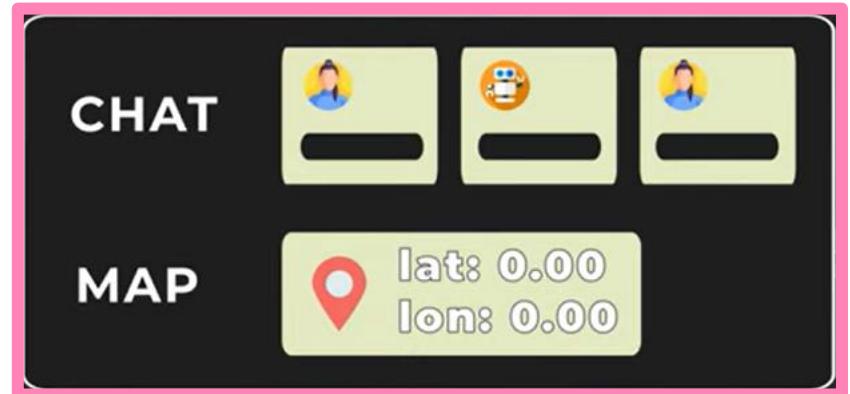


The weather in Boston is currently sunny with a temperature of 22 degrees Celsius.



**Meet
Thomas
Travel
Agent**

Thomas Travel agent



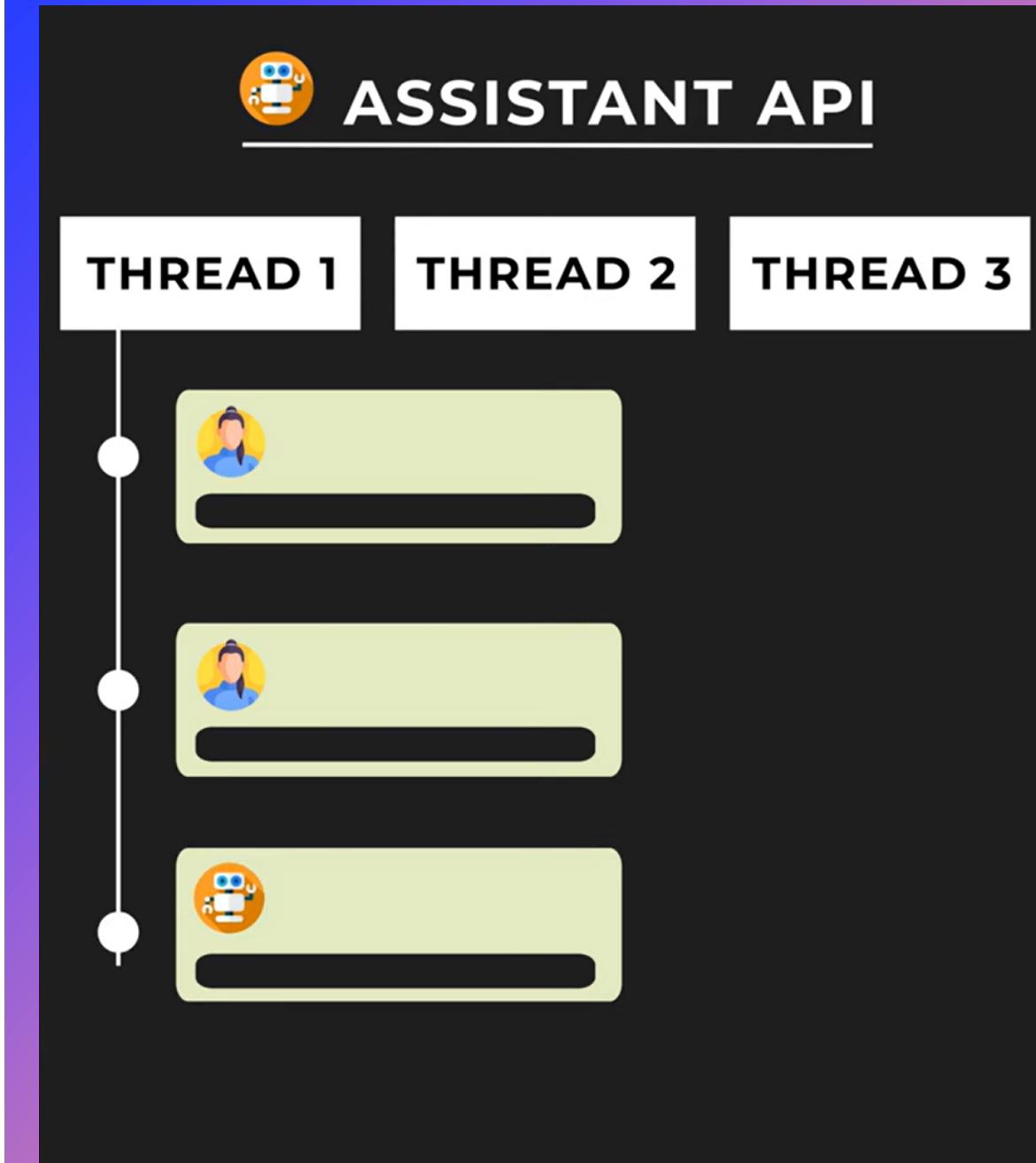
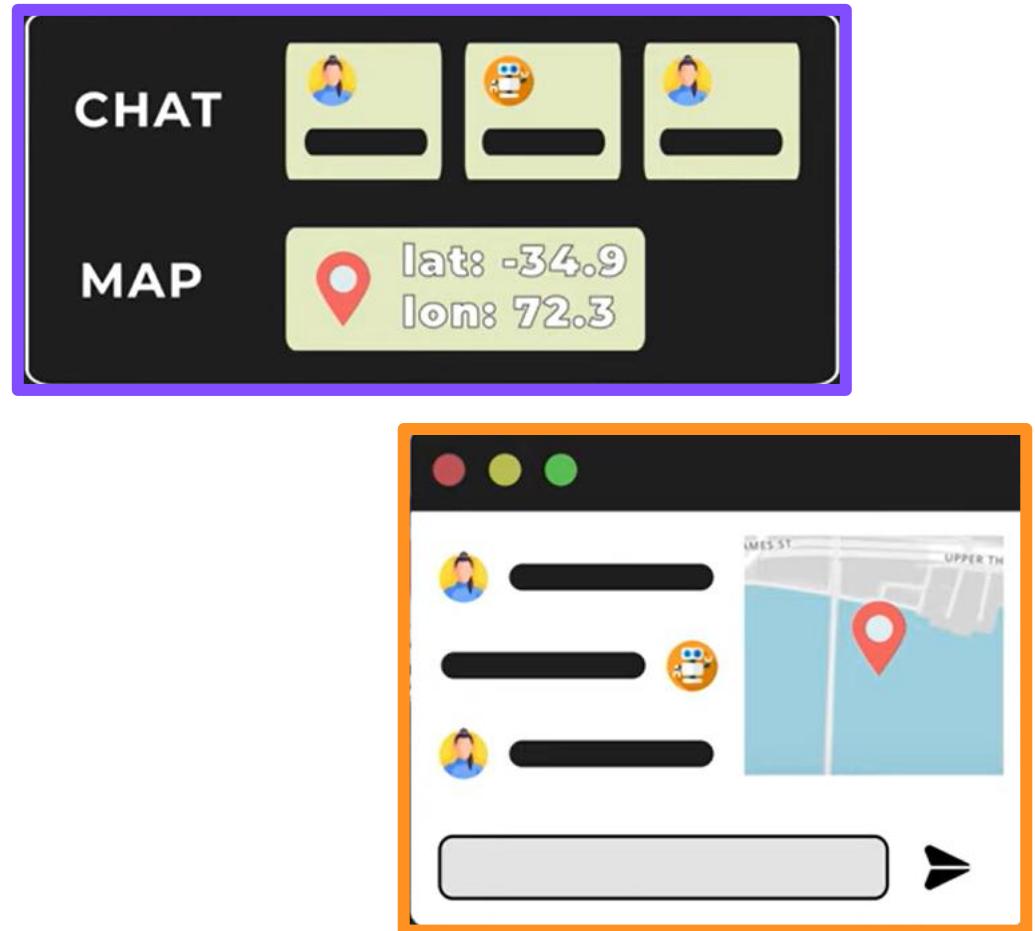
ASSISTANT API

- BE A TRAVEL ASSISTANT

```
1 v {
2   "name": "update_map",
3   "description": "Update map to center on a
particular location",
4   "parameters": {
5     "type": "object",
6     "properties": {
7       "longitude": {
8         "type": "number",
9         "description": "Longitude of the location to
center the map on"
10      },
11      "latitude": {
12        "type": "number",
13        "description": "Latitude of the location to
center the map on"
14      },
15      "zoom": {
16        "type": "integer",
17        "description": "Zoom level of the map"
18      }
19    },
20    "required": [
21      "longitude",
22      "latitude",
23      "zoom"
24    ]
25  }
26 }
```

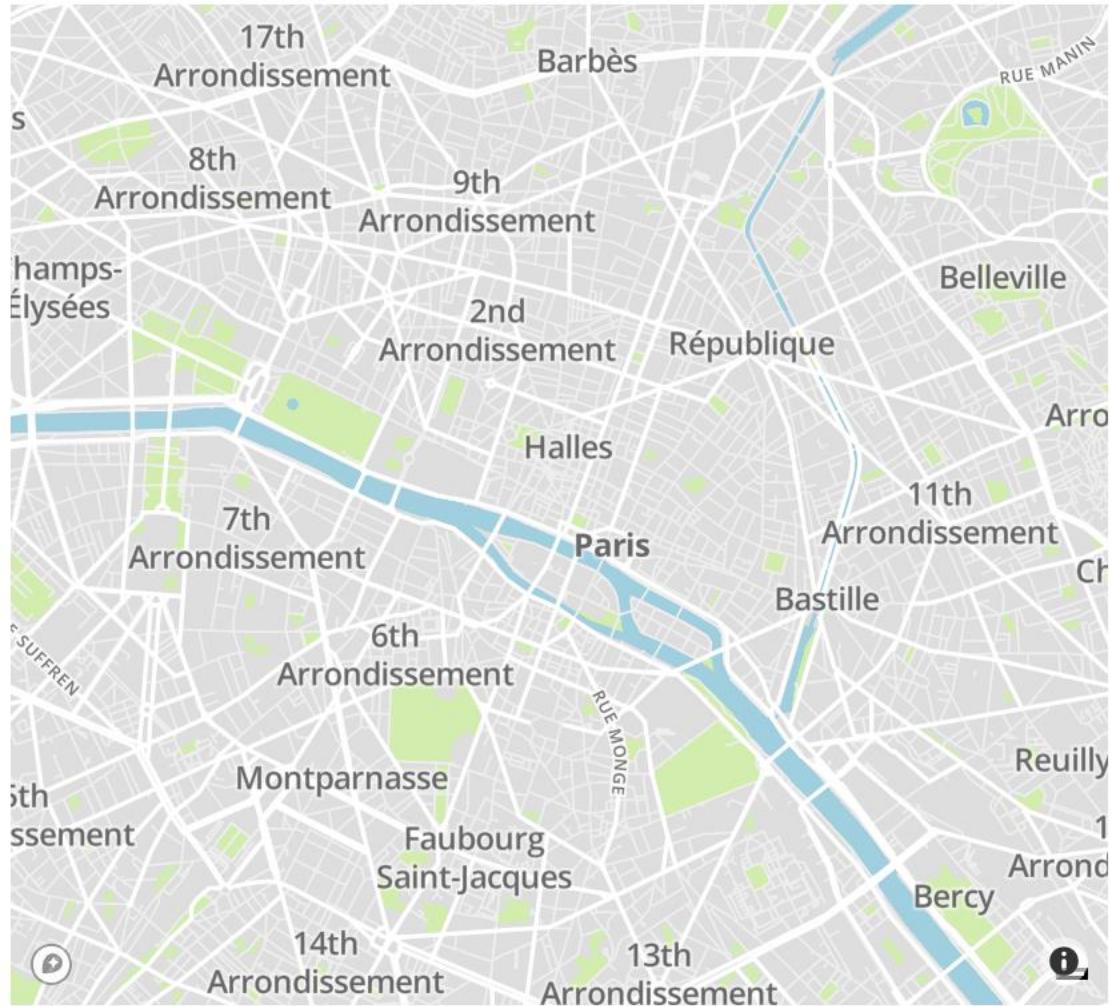


Thomas Travel agent





Hello, my name is Thomas, travel agent at Wanderlust. I'm here to help you plan your trip. Ask me about a location (like Paris), I can take you there and point you to interesting sights to see.

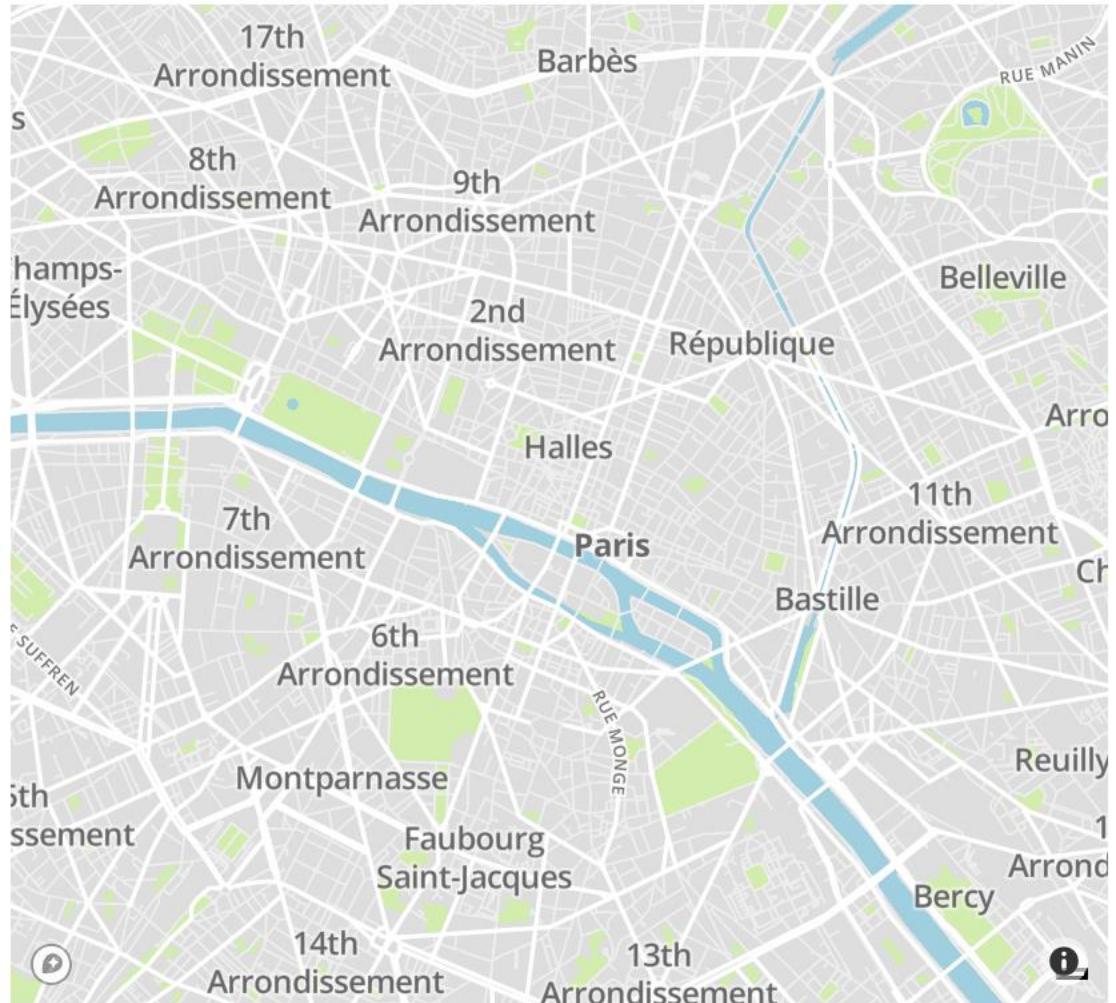


Ask your question to Thomas, our travel agent





Hello, my name is Thomas, travel agent at Wanderlust. I'm here to help you plan your trip. Ask me about a location (like Paris), I can take you there and point you to interesting sights to see.



hello Thomas, what are the things to see in Paris?



landmarks from the water.

8. **Musée d'Orsay** - A museum featuring Impressionist and Post-Impressionist masterpieces.
9. **Tuileries Garden** - A beautiful park ideal for a leisurely walk, located between the Louvre and Place de la Concorde.
10. **Latin Quarter** - A lively area filled with student life, cafes, and historic sites like the Panthéon.

Do you have specific interests or areas you'd like to focus on?



point them on the map



I've marked the major attractions on the map for you! You can now explore locations like the Eiffel Tower, Louvre Museum, Notre-Dame Cathedral, and more. If you need any further details or directions to any particular site, feel free to ask!



Ask your question to Thomas, our travel agent



Assistants

[+ Create](#)

Today, Sep 23

Thomas
asst_8TYKagYYRHiFAyF5RbUDF7HI

2 months ago, Jul 4

Math ter
asst_SUSJUXNiMVDUMkDOHssmEpUd

4 months ago, May 22

GPT expert
asst_W7jTBEcOtGhfVB6ua2vtZ9iE

4 months ago, May 5

Vector search expert
asst_IKH0wC1rCQN1ZnyzGinbYVs3

Data Analyst
asst_somL5t4D3BKYer05lZgcmdY3

Math Tutor
asst_RjI8kOYWula8t6DXPlembrrW

Weather smith

5:49 PM

3:30 PM

8:22 AM

7:06 PM

6:01 PM

10:47 AM

9:10 AM

Thomas

asst_8TYKagYYRHiFAyF5RbUDF7HI

System instructions

You are a helpful travel agent that has access to a map to display information.

Model

gpt-4o-mini

TOOLS File search ⓘ

+ Files

 Code interpreter ⓘ

+ Files

Functions ⓘ

+ Functions

{f} update_map

{f} add_markers

Clone

Updated 9/23, 6:20 PM



Assistants

Last month, Sep 23

Thomas
asst_8TYKagYYRHfAyF5RbUDF7HI

3 months ago, Jul 4

Math ter
asst_SUSJUXNiMVDUMkDOHssmEpUd

5 months ago, May 22

GPT expert
asst_W7jTBEcOtGhfVB6ua2vtZ9iE

5 months ago, May 5

Vector search expert
asst_IKH0wC1rCQN1ZnyzGinbYVs3

Data Analyst
asst_somL5t4D3BKYer05lZgcmdY3

Math Tutor
asst_RjI8kOYWula8t6DXPlembrrW

Weather smith

Edit function

The model will intelligently decide to call functions based on input it receives from the user. [Learn more.](#)

Definition

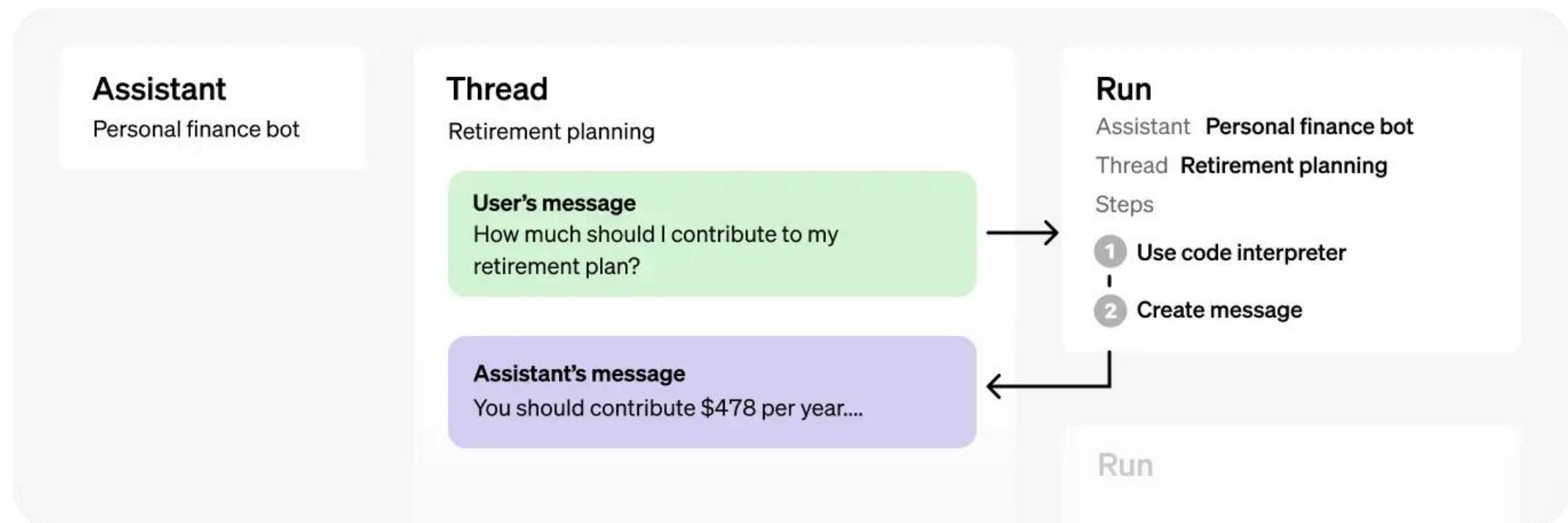
[Generate](#)[Examples](#)

```
{  
  "name": "update_map",  
  "description": "Update map to center on a particular location",  
  "strict": false,  
  "parameters": {  
    "type": "object",  
    "properties": {  
      "longitude": {  
        "type": "number",  
        "description": "Longitude of the location to center the map on"  
      },  
      "latitude": {  
        "type": "number",  
        "description": "Latitude of the location to center the map on"  
      },  
      "zoom": {  
        "type": "integer",  
        "description": "Zoom level of the map"  
      }  
    },  
    "required": [  
      "longitude",  
      "latitude",  
      "zoom"  
    ]  
  }  
}
```

[Cancel](#)[Save](#)

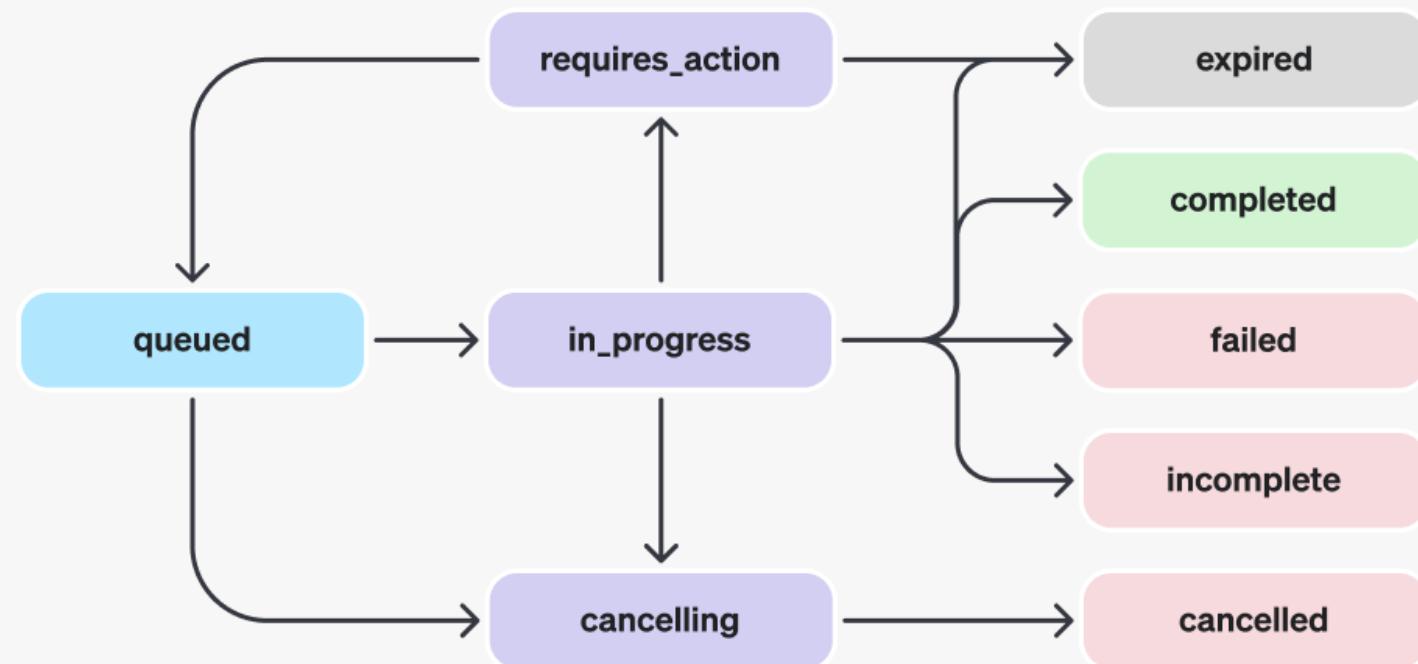
Updated 9/23, 6:20 PM

OpenAI Assistant API



| OBJECT | WHAT IT REPRESENTS |
|-----------|--|
| Assistant | Purpose-built AI that uses OpenAI's models and calls tools |
| Thread | A conversation session between an Assistant and a user. Threads store Messages and automatically handle truncation to fit content into a model's context. |
| Message | A message created by an Assistant or a user. Messages can include text, images, and other files. Messages stored as a list on the Thread. |
| Run | An invocation of an Assistant on a Thread. The Assistant uses its configuration and the Thread's Messages to perform tasks by calling models and tools. As part of a Run, the Assistant appends Messages to the Thread. |
| Run Step | A detailed list of steps the Assistant took as part of a Run. An Assistant can call tools or create Messages during its run. Examining Run Steps allows you to introspect how the Assistant is getting to its final results. |

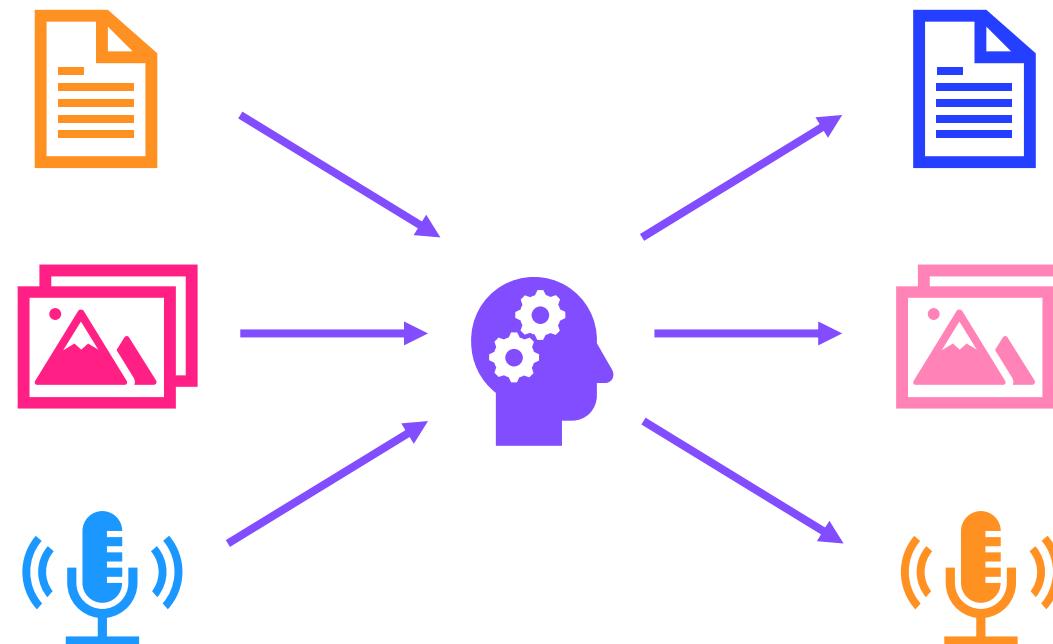
Run lifecycle



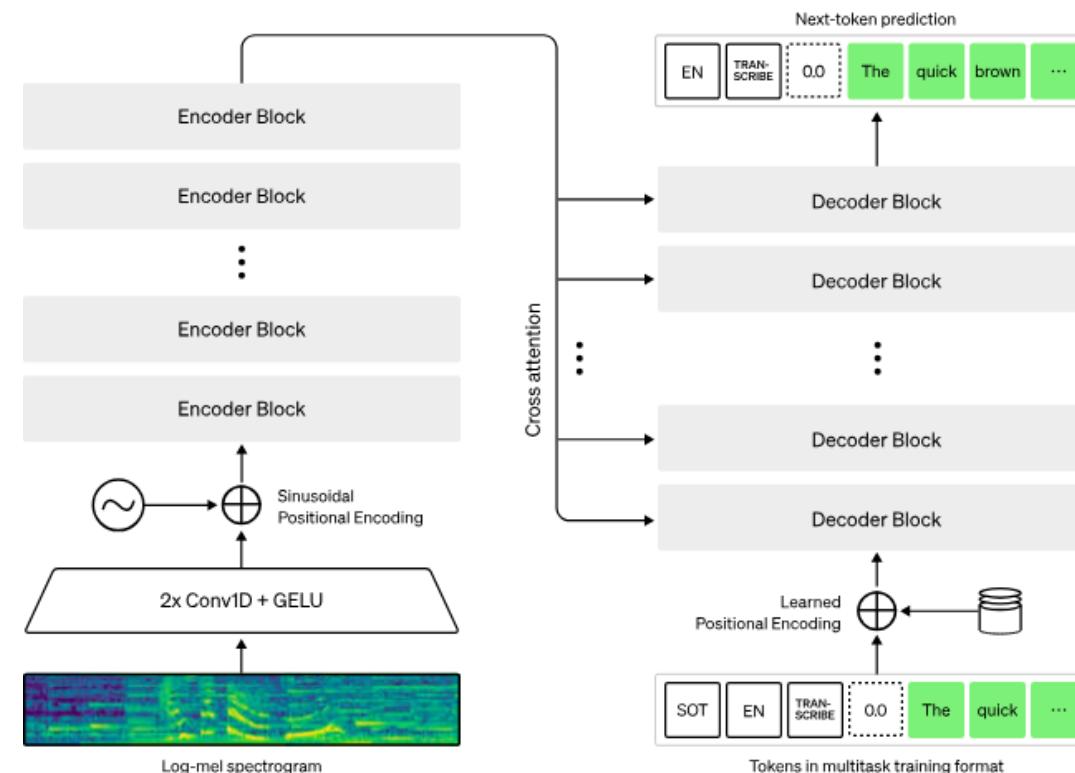
Speech, Vision & Image Generation



Generative AI beyond text



Transcription



<https://openai.com/research/whisper>

Voice synthesis 🎤

Application: Daily Tech Podcast



Techcrunch RSS feed



GitHub Actions



Daily tech podcast

Vision



This image features two characters from a television show. They appear to be talking while walking outside past a parked car. The character on the left is wearing a mustard-colored shirt with a patterned tie and glasses, and the character on the right is wearing a dark suit with a blue tie. There is also a subtitle overlay that reads, "They're gonna be screwed once this whole internet fad is over." This subtitle suggests that the scene might be humorous or ironic, especially since the "internet fad" has proven to be a fundamental part of modern society.



Image Generation with Dall-E

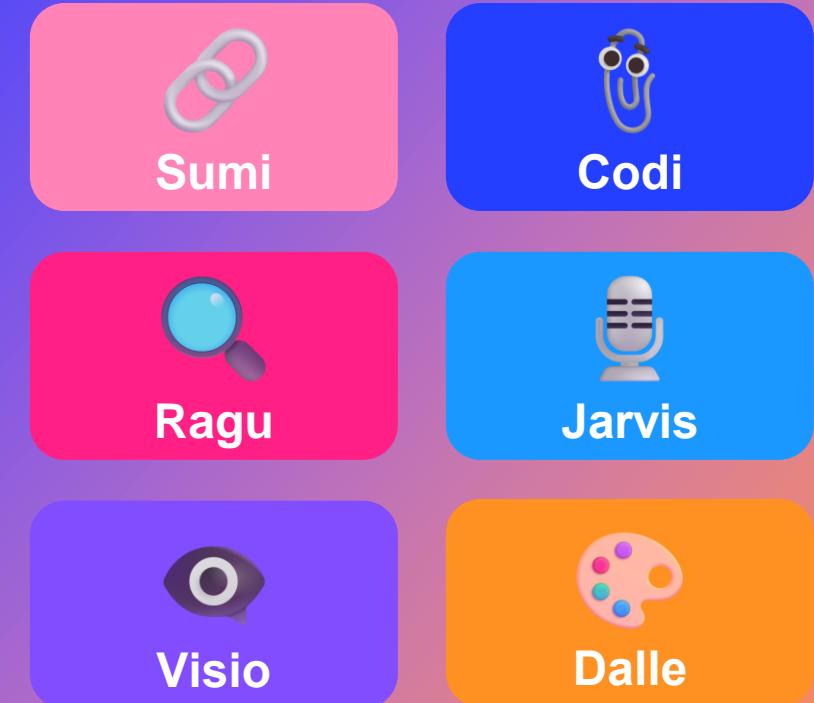


Funny corgi in a cartoon style



GPTs

From a chatbot to an army of agents





config

chains

rag

ChatGPT-like bot 🤖

Selected model: gpt-3.5-turbo

New Chat

convo0

convo1

convo2

convo3



hello



Hello! How can I assist you today?



My name is bob



Hello Bob! How can I help you today?



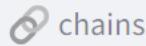
what's my name?



Your name is Bob.

convo1





Select Model

gpt-3.5-turbo



Select Assistant



Select User

 Export history



X

Chains

Selected model: gpt-3.5-turbo

chunk size

900



Max tokens: 16000

Select chapter to summarize

chap8

pages: 10 tokens: 1967

refine

chunks 3

refine

summary 1:

summary 2:

summary 3:

final summary:

In this chapter, the author delves into the realm of AI-driven image generation, focusing on OpenAI's DALL-E model. The discussion covers various Generative AI models, emphasizing DALL-E's capacity to translate text prompts into images. The author shares their experimentation with creating viral videos through AI and producing brief videos on platforms like TikTok. Detailed techniques for image generation and manipulation with DALL-E, such as in- and outpainting methods and crafting graphical novels, are



Selected model: gpt-3.5-turbo



Ask a question

what is vector search

Vector search is a technique for information retrieval that uses a numeric representation of text (vectors) to find documents or passages that are semantically similar. This method involves converting text into vector embeddings, which capture the semantic meaning of the text by mapping words, sentences, or documents into high-dimensional vector spaces. Similar items in this vector space are close to each other, while dissimilar items are far apart. Vector search is commonly used in search engines, recommendation systems, and data retrieval systems to provide more nuanced and context-aware search results.

Source documents



Page: 29

Source: big.pdf

6 4.2.2. Vector search

Now, let's look into the concept of vector search, a technique for information retrieval that leverages a numeric representation of text (as vectors) to find semantically similar documents or passages.

- Embeddings: Vector representation of text

Vector embeddings capture the semantic meaning of text by mapping words, sentences, or documents into high-dimensional vector spaces. Similar items in this space are close to each



chatty

config

chains

rag

Codi



(asst_5zjj3Cp5W2DOT6sRLeT6Cf23)

Model: gpt-3.5-turbo

Prompt examples ^

1+1

How to solve the equation $3x + 11 = 14$?

What is the 42nd element of Fibonacci?

What is the 10th element?

plot function $1/\sin(x)$

zoom in to range of x values between 0

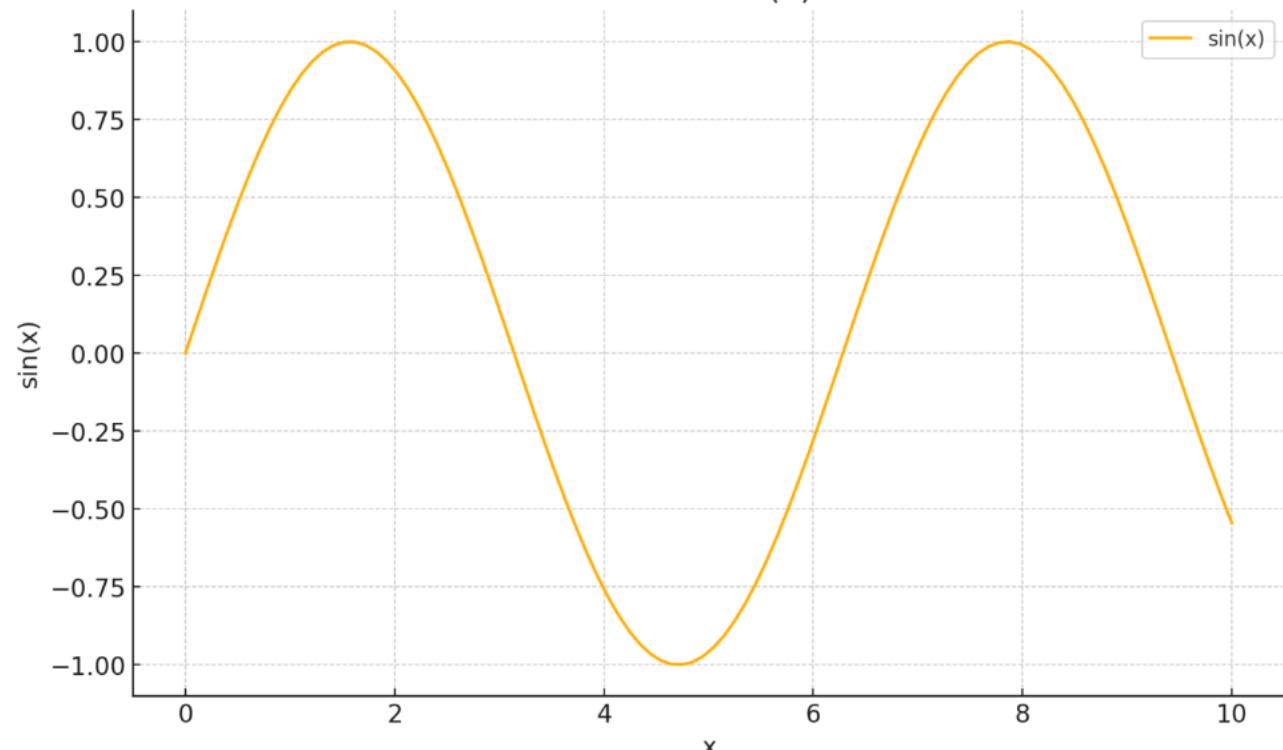
1



plot function $\sin(x)$



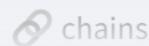
Plot of $\sin(x)$



Here is the plot of the function ($y = \sin(x)$) for (x) values between 0 and 10. The sine function is a periodic function that oscillates between -1 and 1.

Your message





X

Voice

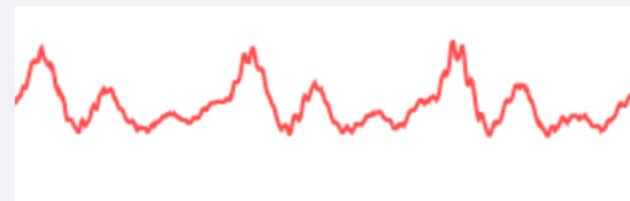
Selected model: gpt-3.5-turbo

Start Recording

Stop

Reset

Download



▶ 0:00 / 0:00



Hello Jarvis, I need your help in designing a new suit.



Of course! I'd be happy to help you with that. What kind of suit are you looking to design?



I want one that I can take to battle.



Sure thing! Let's start by determining the purpose of the suit. Are you looking for something with heavy armor for maximum protection, or do you want something more flexible for agility and mobility in battle?



I want one that has style and chrome.



Great choice! A stylish suit with chrome accents can definitely make a statement on the battlefield. Let's start by sketching out some design ideas. Do you have any specific colors or themes in mind for the suit?



chatty

config

chains

rag

visio



What is in the image?



Funny corgi in a cartoon style



7e3ccf47366442cb33744132859577a7212bf5cb5f1e30014c3b7132.jpg



What is in the image?

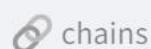


The image features a colorful illustration of a cheerful cartoon dog, possibly a Corgi, with a big smile and its tongue playfully sticking out. The dog is wearing a blue plaid shirt. In the background, there is a well-kept yard with a white picket fence, lush green bushes, a rocking chair, and some flowers, indicating a cozy outdoor domestic setting. A smaller image of a similar dog is partially visible in the bottom left corner, looking at a picture frame. The general atmosphere is bright and joyful, suggesting a playful and family-friendly theme.

Ask question about images



X



dalle



Select Model

 dall-e-3 dall-e-2

Select Size

 1024x1024 1792x1024 1024x1792

Prompt dall-e-3:

a funny corgi

Generate Image



Appendix

+
o .

GPT Builder

Hello World

x
o
o

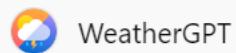




WeatherGPT ▾



ChatGPT



WeatherGPT



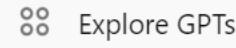
ThingSpeakGPT



Data Analyst



DALL-E



Explore GPTs

Today

Adar former name Rings of Power

Storing FAISS Index

Yesterday

Fibonacci Sequence Inquiry

Fibonacci Sequence Calculation

Advanced GenAI Course Outline

Previous 7 Days



Renew Plus



WeatherGPT

By Yann Debray [LinkedIn](#) [GitHub](#)

Provides current weather info and forecasts

What's the
weather like in
Boston today?



Message WeatherGPT



ChatGPT can make mistakes. Check important info.



Step 1: LocalIGPT tunnel traffic to your localhost



ActionsGPT

By ChatGPT 

Helps you create OpenAPI specifications from documentation, code examples, cURL commands, or just a description of how to use an API.

ngrok

(Ctrl+C to quit)

New guides <https://ngrok.com/docs/guides/site-to-site-apis/>

Session Status

online
yann.debray@gadz.org (Plan: Free)

Account

Version

Region

Latency

Web Interface

Forwarding

Connections

| | ttl | opn | rt1 | rt5 | p50 | p90 |
|--|-----|-----|------|------|------|------|
| | 31 | 0 | 0.01 | 0.00 | 0.09 | 0.72 |

HTTP Requests

GET /weather 401 UNAUTHORIZED

GET /weather 200 OK

GET /weather 200 OK

GET /weather 200 OK

GET /weather 200 OK

GET /weather 304 NOT MODIFIED

GET /weather 500 INTERNAL SERVER ERROR

GET /weather 304 NOT MODIFIED

GET /weather 304 NOT MODIFIED

GET /weather 500 INTERNAL SERVER ERROR

You are about to visit:

4564-71-192-208-255.ngrok-free.app

Website IP: 71.192.208.255

- This website is served for free through [ngrok.com](#).
- You should only visit this website if you trust whoever sent the link to you.
- Be careful about disclosing personal or financial information like passwords, phone numbers, or credit cards.

[Visit Site](#)

Are you the developer?

We display this page to prevent abuse. Visitors to your site will only see it once.

To remove this page:

- Set and send an `ngrok-skip-browser-warning` request header with any value.
- Or, set and send a custom/non-standard browser `User-Agent` request header.
- Or, please [upgrade](#) to any paid ngrok account.

Authentication

None



Preview

Schema

Import from

```
openapi: 3.1.0
info:
  title: Weather
  description: Get weather data for a given city.
  version: v1
servers:
  - url: https://4564-71-192-208-255.ngrok-free.app/
paths:
  /weather:
    get:
      operationId: getWeatherData
      summary: Retrieves the weather data.
      parameters:
        - in: query
          name: city
          schema:
            type: string
            description: The city to get the weather from. For example, "London, UK".
      responses:
        "200":
          description: OK
```

Authentication

Authentication Type

 None API Key OAuth

API Key

[HIDDEN] **Insert none empty value**

Auth Type

 Basic Bearer Custom

Custom Header Name

ngrok-skip-browser-warning

Cancel

Save



LocalGPT

Available actions

Name

Method

Path

getWeatherData

GET

/weather

Test



Message LocalGPT



Authentication

API Key



Schema

Import from URL

Examples



```
openapi: 3.1.0
info:
  title: Weather
  description: Get weather data for a given city.
  version: v1
servers:
  - url: https://4564-71-192-208-255.ngrok-free.app/
paths:
  /weather:
    get:
      operationId: getWeatherData
      summary: Retrieves the weather data.
      parameters:
        - in: query
          name: city
          schema:
            type: string
            description: The city to get the weather from. For example, London,uk.
      responses:
        "200":
          description: OK
```

Format

Test

Preview

Call the 4564-71-192-208-255.ngrok-free.app API with the getWeatherData operation



> [debug] Calling HTTP endpoint

LocalGPT wants to talk to 4564-71-192-208-255.ngrok-free.app

Allow

Always Allow

Decline

⚠ Only allow sites you trust.

Available actions

| Name | Method | Path | |
|----------------|--------|----------|--|
| getWeatherData | GET | /weather | |



Message LocalGPT



Edit actions

Let your GPT retrieve information or take actions outside of ChatGPT.

[Learn more.](#)



Authentication

API Key



[Import from URL](#)

Examples



Schema

```
openapi: 3.1.0
info:
  title: Weather
  description: Get weather data for a given city.
  version: v1
servers:
  - url: https://4564-71-192-208-255.ngrok-free.app
paths:
  /weather:
    get:
      operationId: getWeatherData
      summary: Retrieves the weather data.
      parameters:
        - in: query
          name: city
          schema:
            type: string
            description: The city to get the weather from. For example, London,uk.
      responses:
        "200":
          description: OK
```

Format

Preview

GPT updated

What's the weather in London?

- > [debug] Calling HTTP endpoint
- > [debug] Calling HTTP endpoint
- > [debug] Response received

Talked to 4564-71-192-208-255.ngrok-free.app

The current weather in London is as follows:

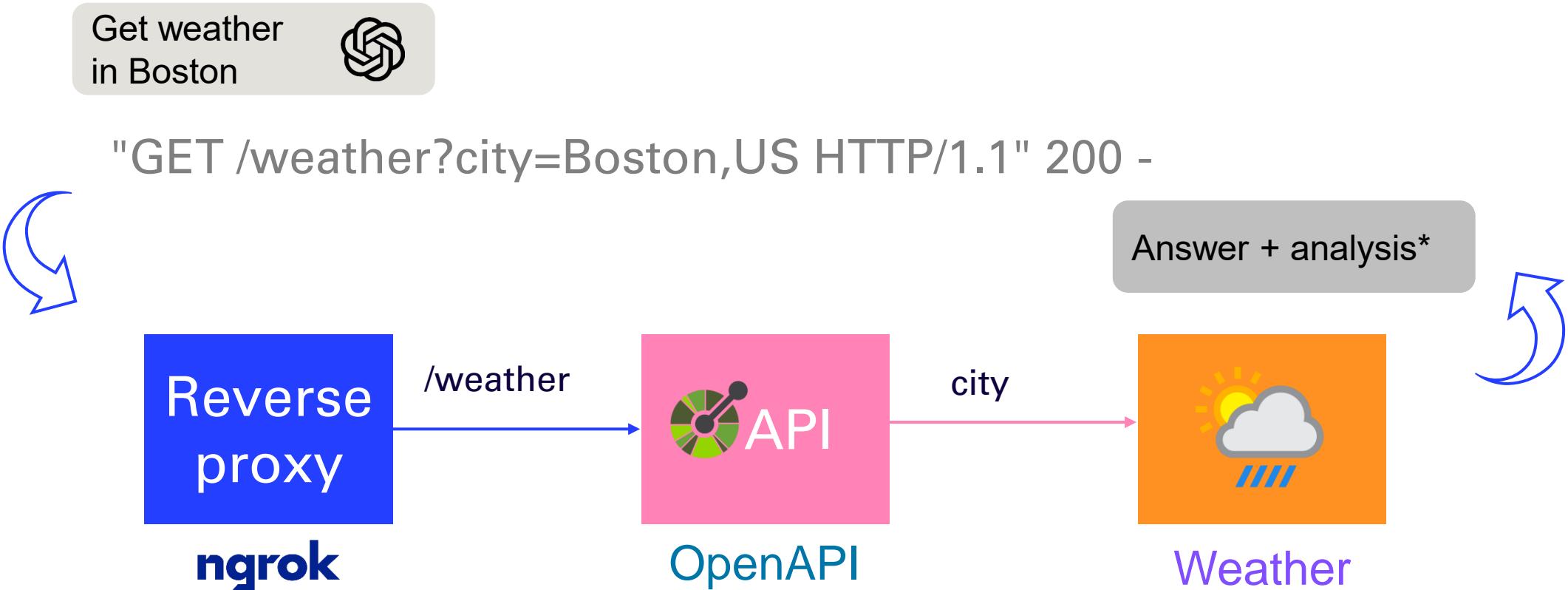
- **Temperature:** 280.32 K (7.17°C)
- **Maximum Temperature:** 281.15 K (8.00°C)
- **Minimum Temperature:** 279.15 K (6.00°C)
- **Humidity:** 81%
- **Pressure:** 1012 hPa



Message LocalGPT



Step 2: WeatherGPT architecture



* Analysis powered by Code Interpreter



api.openweathermap.org/data/2.5/weather?lat=42.3584&lon=-71.0598



```
1 {  
2   "coord": {  
3     "lon": -71.0598,  
4     "lat": 42.3584  
5   },  
6   "weather": [  
7     {  
8       "id": 701,  
9       "main": "Mist",  
10      "description": "mist",  
11      "icon": "50d"  
12     }  
13   ],  
14   "base": "stations",  
15   "main": {  
16     "temp": 287.04,  
17     "feels_like": 286.83,  
18     "temp_min": 285.94,  
19     "temp_max": 288.18,  
20     "pressure": 1000,  
21     "humidity": 90  
22   },  
23   "visibility": 4023,  
24   "wind": {  
25     "speed": 3.6,  
26     "deg": 340  
27   },  
28   "clouds": {  
29     "all": 100  
30   },  
31   "dt": 1717951763,  
32   "sys": {  
33     "type": 2,  
34     "id": 2013408,  
35     "country": "US",  
36     "sunrise": 1717924043,  
37     "sunset": 1717978802  
38   },  
39   "timezone": -14400,  
40   "id": 4930956,  
41   "name": "Boston",  
42   "cod": 200  
43 }
```

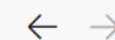


4564-71-192-208-255.ngrok-free



```
1 {  
2   "city": "Boston",  
3   "current_time": "2024-06-09 12:57:06.684202",  
4   "feels_like": 56.62,  
5   "humidity": 90,  
6   "lat": 42.3584,  
7   "lon": -71.0598,  
8   "pressure": 1000,  
9   "temp": 57,  
10  "temp_max": 59.05,  
11  "temp_min": 55.02  
12 }
```





code-interpreter



streamlit_app.py M

notebook.ipynb M

weather.py U

main.py U X

D ▾ ⌂ ⌂ ...

gpt > Basic-auth > main.py > ...

```
33     @app.route('/weather', methods=['GET'])
34     def get_weather_data():
35         if not validate_api_key(request):
36             return Response(json.dumps({"error": "Invalid API key"}),
37                             status=401,
38                             mimetype='application/json')
39         city = request.args.get('city', 'Boston,US') # default city is Boston, US
40         if not city:
41             return Response(json.dumps({"error": "City parameter is required"}),
42                             status=400,
43                             mimetype='application/json')
44
45         url = f'http://api.openweathermap.org/data/2.5/weather?q={city}&appid={app_id}&units=imperial'
46         response = requests.get(url)
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

JUPYTER

POSTMAN CONSOLE

AZURE

COMMENTS

python

▼

...

^

X

er instead.

- * Running on all addresses (0.0.0.0)
- * Running on http://127.0.0.1:8080
- * Running on http://172.31.141.7:8080

Press CTRL+C to quit

- * Restarting with watchdog (windowsapi)
- * Debugger is active!
- * Debugger PIN: 975-620-553

127.0.0.1 - - [09/Jun/2024 13:23:33] "GET /weather?city=Boston,US HTTP/1.1" 401 -



main* ↻ ✘ 0 ⚠ 0 ⌂ 0

Ln 70, Col 9 Spaces: 4 UTF-8 CRLF { Python 3.10.10 ('env': venv)



main.py x openapi.yaml +

main.py

```
1 # https://mer.vin/2023/11/get-stock-price-with-basic-auth/
2 from flask import Flask, request, Response
3 from urllib.request import urlopen
4 import json, datetime, os
5
6 # Api key for openweathermap.org can be provided as an environment
7 # variable
8 app_id = os.getenv('api_key')
9 app = Flask(__name__)
10
11 def validate_api_key(request):
12     auth_header = request.headers.get('Authorization')
13     if not auth_header:
14         return False
15
16     try:
17         auth_type, provided_api_key = auth_header.split(None, 1)
18         if auth_type.lower() != 'basic':
19             return False
20
21         return provided_api_key == app_id
22     except Exception:
23         return False
24
25
26 @app.route('/')
--
```

> Console

Shell

Deployments x +

< ...

0.5 vCPU / 2 GiB RAM

\$12.80 per month (\$0.0166/hour)

Primary domain ⓘ

weatherGPT

.replit.app

✓ Available

Build command ⓘ optional

Run command ⓘ

python3 main.py

Deployment secrets ⓘ

api_key

.....

+ Add deployment secret

App type ⓘ

Web Server

Background Worker

▼

Port configuration ⓘ

Deploy

```
C:\Users\ydebray>curl -H "Authorization: Basic [REDACTED]" "https://weather-gpt.replit.app/weather?city=Boston, US"
{
  "city": "Boston",
  "current_time": "2024-06-09 20:48:57.647985",
  "feels_like": 66.99,
  "humidity": 71,
  "lat": 42.3584,
  "lon": -71.0598,
  "pressure": 999,
  "temp": 67.23,
  "temp_max": 70.63,
  "temp_min": 62.94
}
```

```
C:\Users\ydebray>
```

```
C:\Users\ydebray>curl -H "Authorization: Basic [REDACTED]" "https://weather-gpt.replit.app/weather?city=Boston, US"
{
  "city": "Boston",
  "current_time": "2024-06-09 20:48:57.647985",
  "feels_like": 66.99,
  "humidity": 71,
  "lat": 42.3584,
  "lon": -71.0598,
  "pressure": 999,
  "temp": 67.23,
  "temp_max": 70.63,
  "temp_min": 62.94
}
```

```
C:\Users\ydebray>curl -H "Authorization: Basic My_API_Key" "http://127.0.0.1:8080"
Hello, Weather!
C:\Users\ydebray>curl -H "Authorization: Basic test" "http://127.0.0.1:8080"
Hello, Weather!
C:\Users\ydebray>curl -H "Authorization: Basic test" "http://127.0.0.1:8080/weather"
{"error": "Invalid API key"}
C:\Users\ydebray>curl -H "Authorization: Basic My_API_Key" "http://127.0.0.1:8080/weather"
{"error": "City parameter is required"}
C:\Users\ydebray>curl -H "Authorization: Basic My_API_Key" "http://127.0.0.1:8080/weather?city=London,uk"
{
  "city": "London",
  "current_time": "2024-06-09 18:23:06.389991",
  "humidity": 81,
  "lat": 51.51,
  "lon": -0.13,
  "pressure": 1012,
  "temp": 280.32,
  "temp_max": 281.15,
  "temp_min": 279.15
}
```

```
C:\Users\ydebray\Downloads\gpt-programming-book\chap10\Basic-auth>python main.py
 * Serving Flask app 'main'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:8080
 * Running on http://172.31.141.62:8080
Press CTRL+C to quit
 * Restarting with watchdog (windowsapi)
 * Debugger is active!
 * Debugger PIN: 710-487-545
127.0.0.1 - - [09/Jun/2024 18:38:33] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [09/Jun/2024 18:38:58] "GET /weather HTTP/1.1" 400 -
127.0.0.1 - - [09/Jun/2024 18:39:18] "GET /weather HTTP/1.1" 401 -
127.0.0.1 - - [09/Jun/2024 18:39:24] "GET /weather?city=London,uk HTTP/1.1" 200 -
```



Edit actions



Let your GPT retrieve information or take actions outside of ChatGPT.

[Learn more.](#)

Authentication

API Key



Schema

[Import from URL](#)

Examples



```
{  
  "openapi": "3.1.0",  
  "info": {  
    "title": "Get weather data",  
    "description": "Retrieves current weather data for a given city.",  
    "version": "v1.0.0"  
  },  
  "servers": [  
    {  
      "url": "https://weather-gpt.replit.app"  
    }  
  ],  
  "paths": {  
    "/weather": {  
      "get": {  
        "description": "Get temperature for a specific location",  
        "operationId": "GetCurrentWeather",  
        "parameters": [  
          {  
            "name": "city",  
            "in": "query",  
            "description": "The city and state to retrieve the weather for",  
            "required": true,  
            "schema": {}  
          }  
        ]  
      }  
    }  
  }  
}
```

Format

Preview

weather in Boston



> [debug] Calling HTTP endpoint

> [debug] Response received

Talked to weather-gpt.replit.app

The current weather in Boston is as follows:

- **Temperature:** 66.99°F (feels like 66.72°F)
- **Humidity:** 71%
- **Pressure:** 999 hPa
- **Temperature Range:** 62.56°F to 70.63°F

If you need any more details, just let me know!



Message WeatherGPT



Step 3: Deploy GPT



WeatherGPT

By Yann Debray



Provides current weather info and forecasts

What's the weather like in London today?

 Talked to weather-plugin-yanndebray.replit.app

The current weather in London is as follows:

- **Temperature:** 280.32 K (approximately 7.17°C or 45°F)
- **Humidity:** 81%
- **Wind Speed:** 4.1 m/s
- **Pressure:** 1012 hPa
- **Temperature Range:** 279.15 K to 281.15 K (approximately 6°C to 8°C or 43°F to 46°F)

It's a cool day with high humidity and a gentle breeze. You might want to wear a jacket if you're heading outside.

🔉 🔍 🌡️ ⏪ ⏴

 Message Weather Bot 

ChatGPT can make mistakes. Check important info.