

What is the OpenAI API?

WORKING WITH THE OPENAI API

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Coming up...

Course goals

- Use the *OpenAI API* to access AI models
- Use those models to solve various tasks
- Use **Python** code to do this!

Expected knowledge

- Subsetting Python lists and **dictionaries**
- Control flow → `if` , `elif` , `else`
- Loops → `for` , `while`

Not expected to know

- AI or machine learning

OpenAI, ChatGPT, and the OpenAI API

- OpenAI = AI R&D company
- ChatGPT = AI application
- OpenAI API = Interface for accessing OpenAI models



OpenAI

¹ Image Credit: OpenAI

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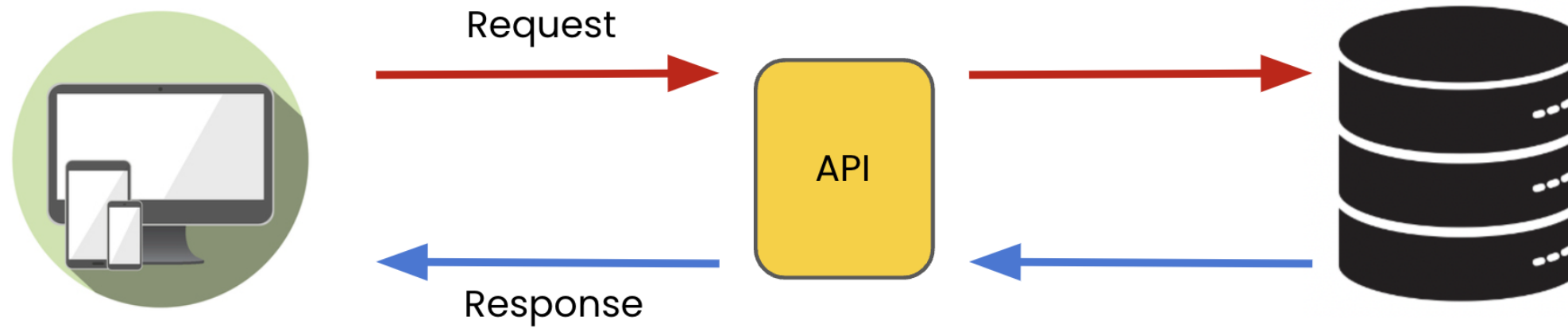
OpenAI, ChatGPT, and the OpenAI API

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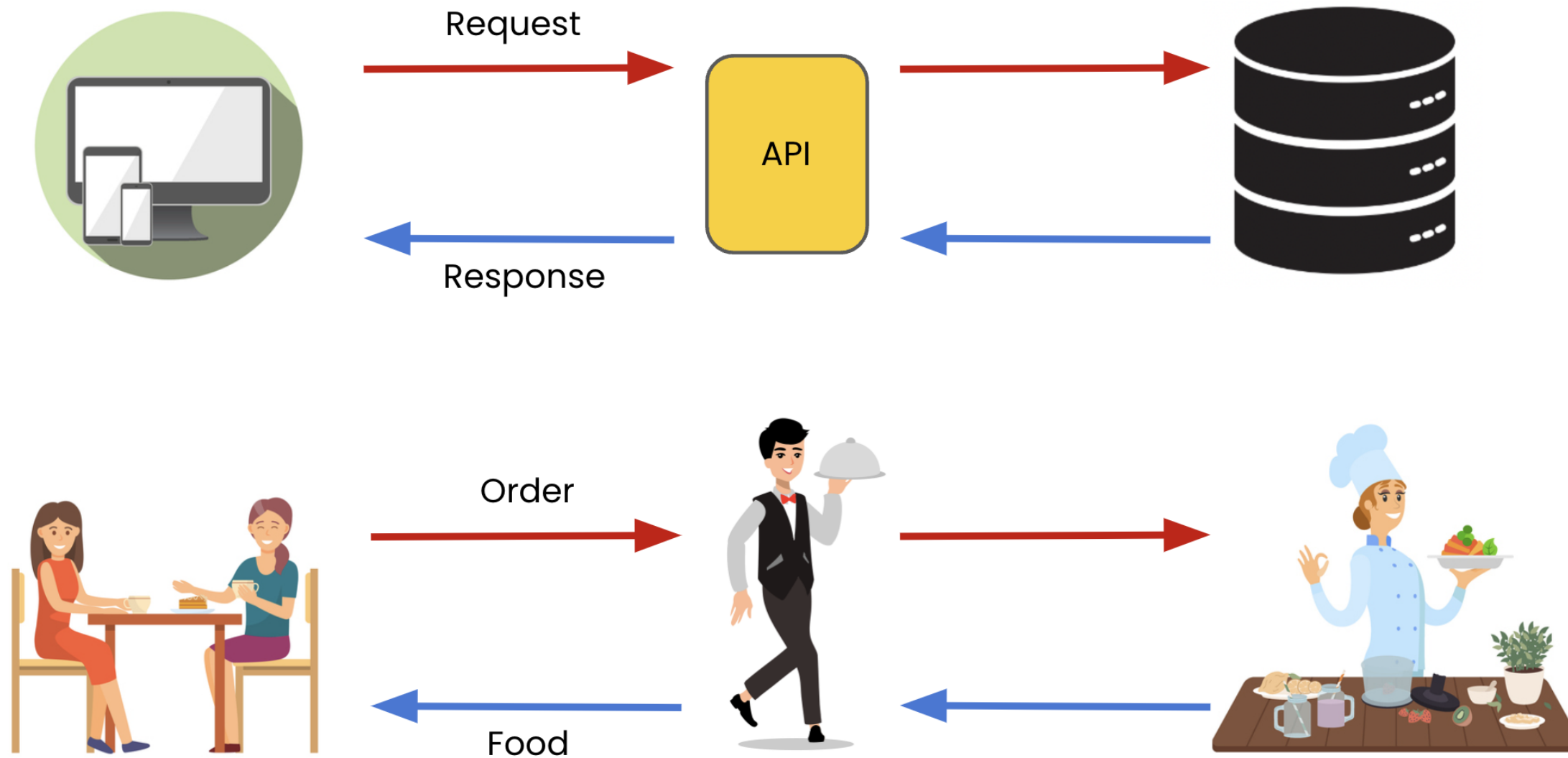
What is an API?

- Application Programming Interface

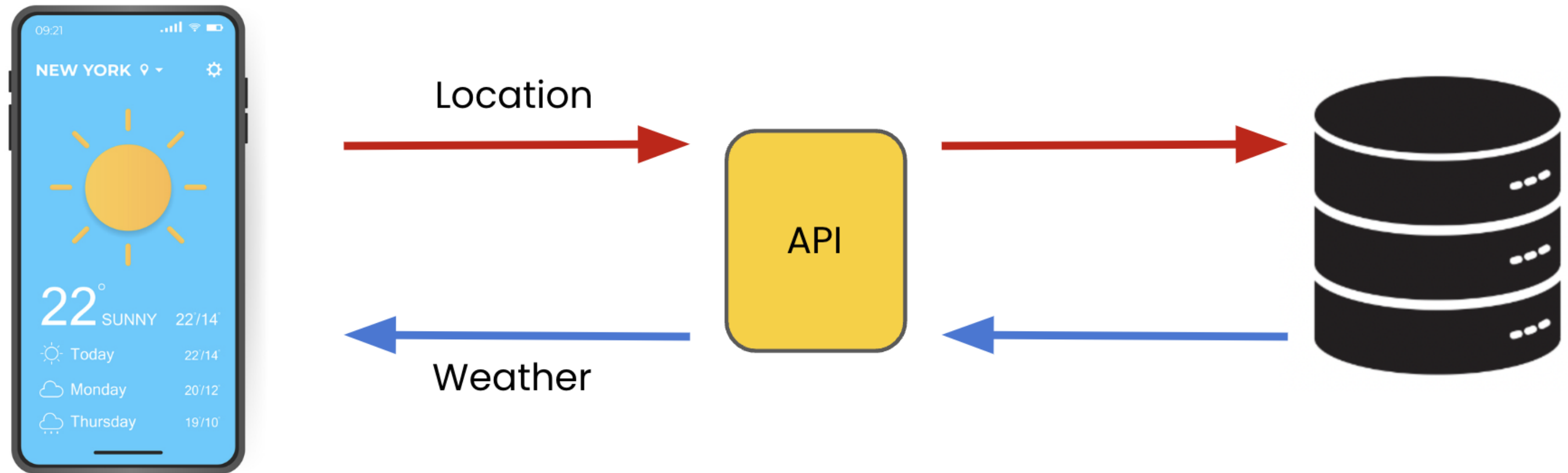


What is an API?

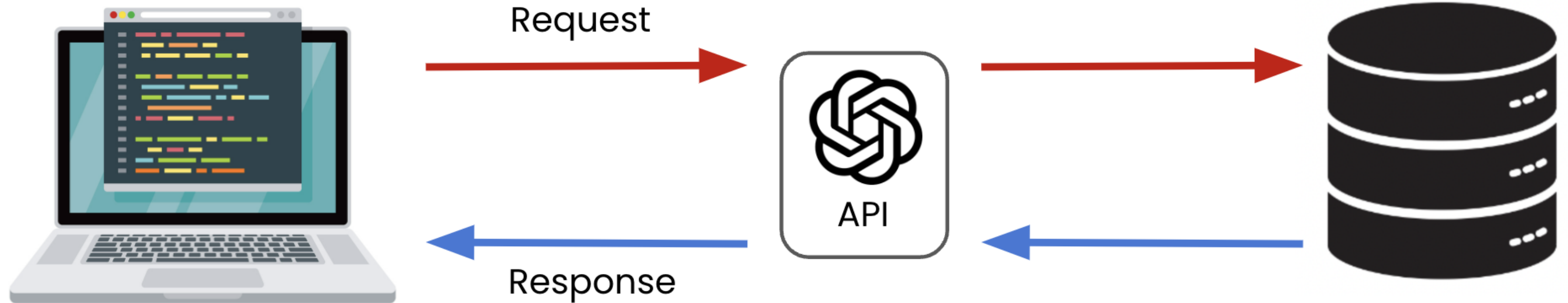
- Application Programming Interface



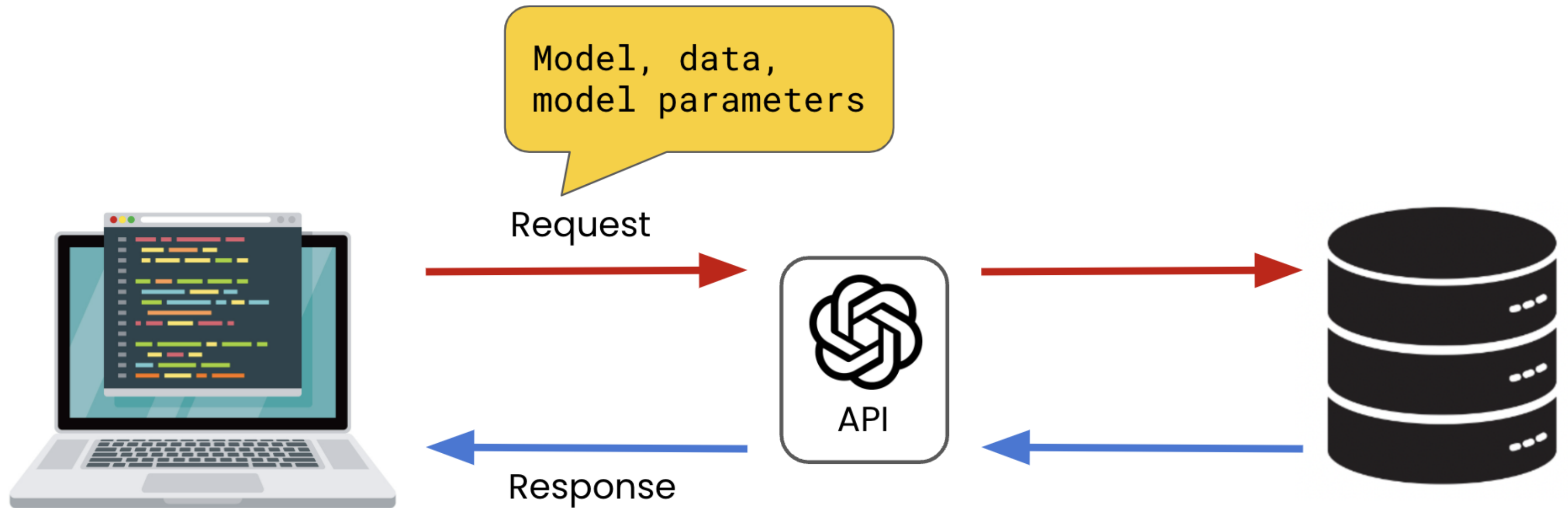
What is an API?



The OpenAI API

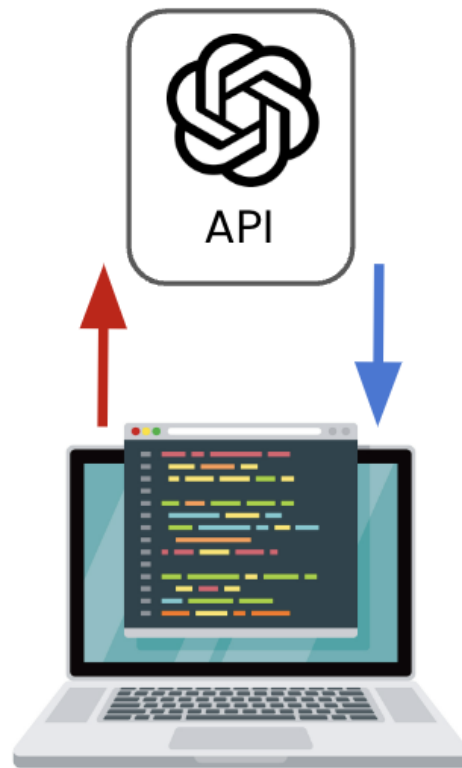


The OpenAI API



API vs. web interface

- Provides *flexibility* for integrating AI into products, experiences, and processes
- Interact via programming language



- Very little setup
- Sufficient for *streamlining* individual's workflows

The screenshot shows a chat window with a dark background. At the top, a user prompt says "Write Python code for drawing a scatter plot." Below it, an AI response from GPT-4 provides an example using the 'matplotlib' library. The code is displayed in a dark-themed editor with a 'Copy code' button in the top right corner.

```
python
import matplotlib.pyplot as plt

# Example data
x = [1, 2, 3, 4, 5]
y = [2, 4, 1, 3, 5]

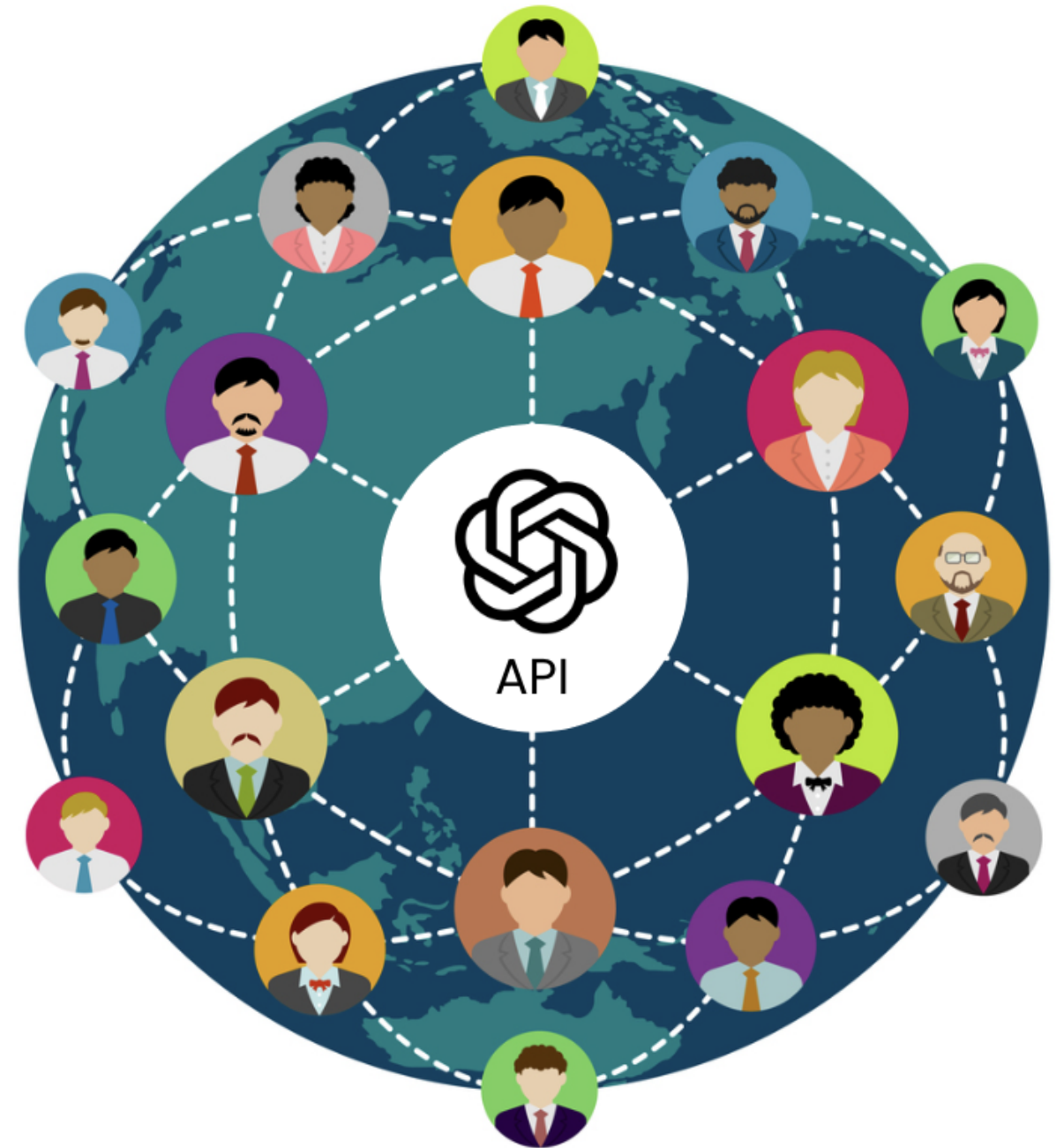
# Draw scatter plot
plt.scatter(x, y)

# Add labels and title
plt.xlabel('X-axis')
plt.ylabel('Y-axis')
plt.title('Scatter Plot Example')

# Show plot
plt.show()
```

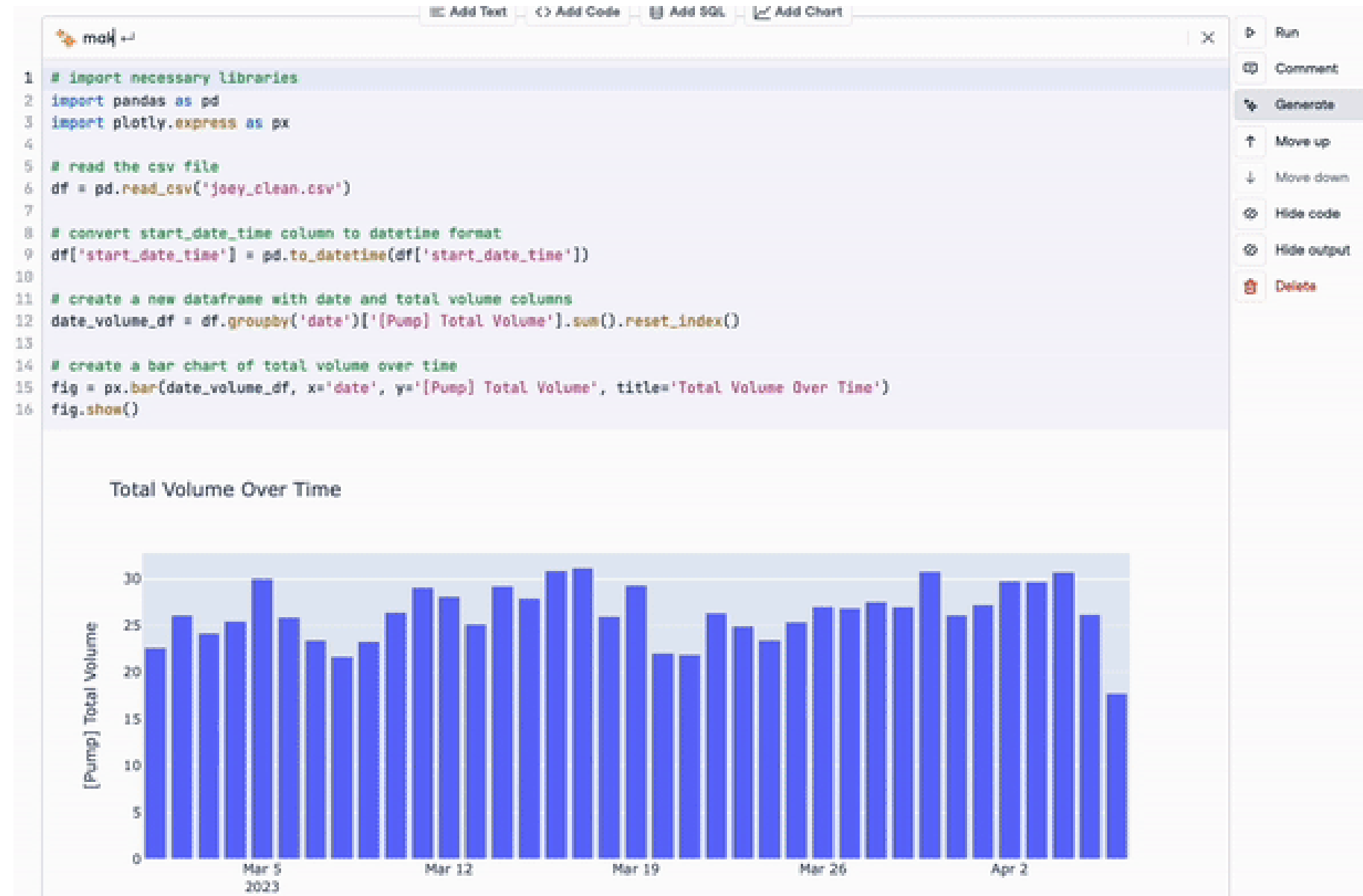
Why the OpenAI API?

- Accessibility to AI
- Don't require data or ML experience



Building AI applications

DataCamp Workspace = Cloud-based IDE



Let's practice!
WORKING WITH THE OPENAI API

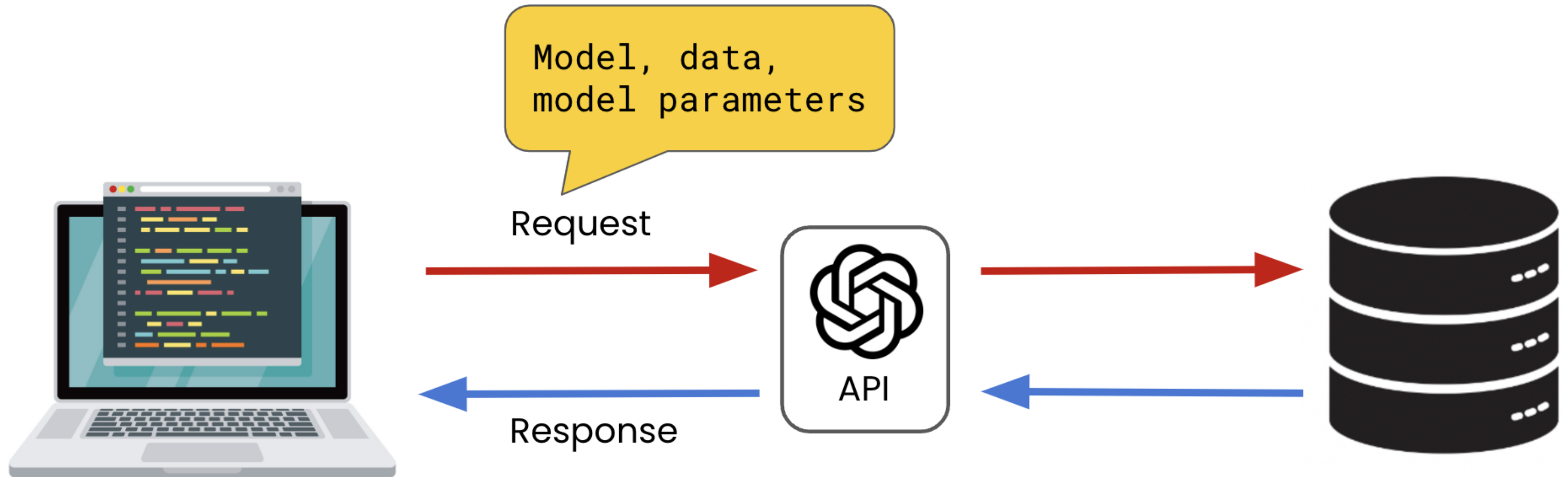
Making requests to the OpenAI API

WORKING WITH THE OPENAI API

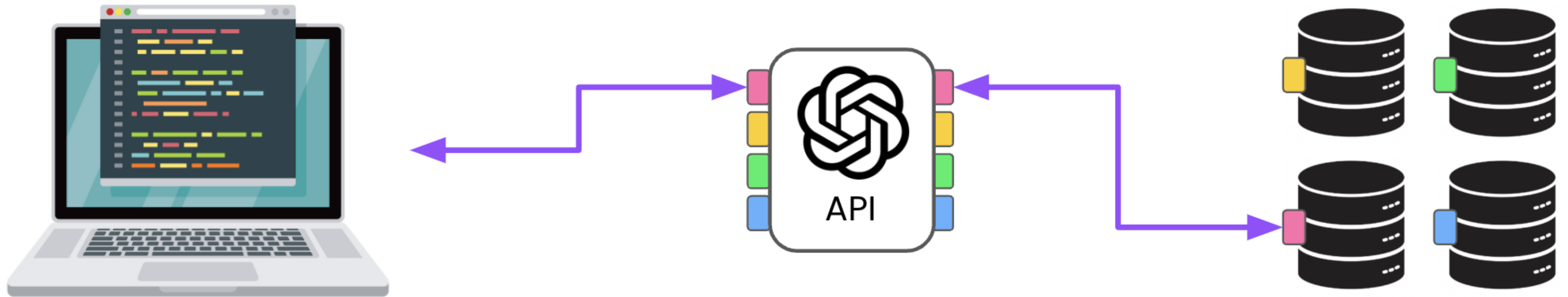
James Chapman

Curriculum Manager, DataCamp

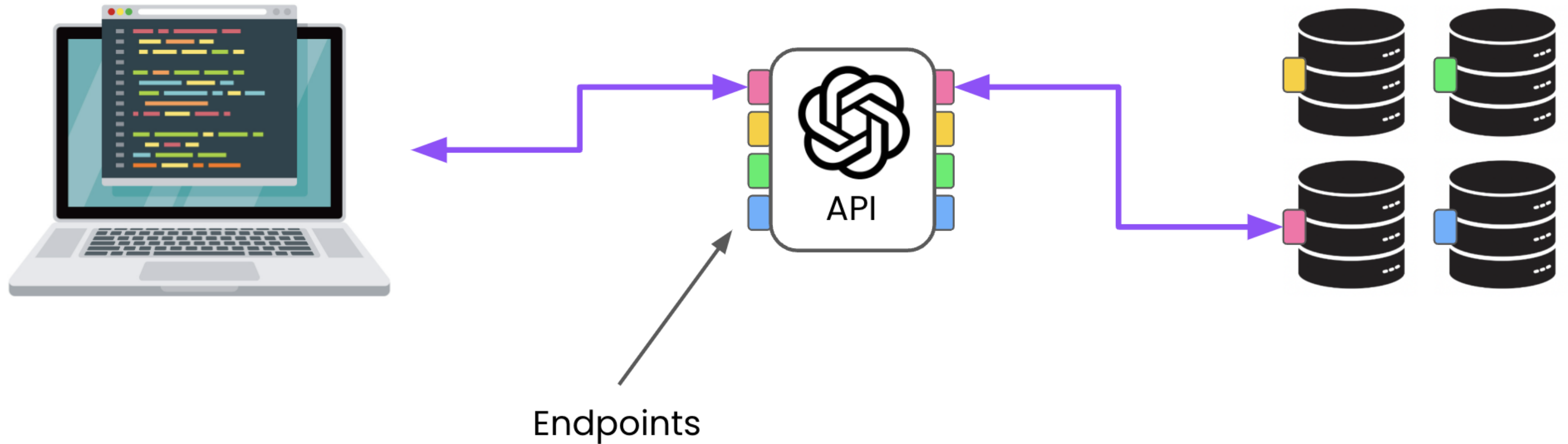
APIs recap...



API endpoints



API endpoints



API endpoints

- Endpoints → API access point designed for specific interactions



API authentication

- Authentication → Controls on access to API endpoint services (often unique key)



API usage costs

- For OpenAI API:
 - Larger inputs + outputs = Greater cost



¹ <https://openai.com/pricing>

API documentation

 [Overview](#) [Documentation](#) [API reference](#) [Examples](#) [Playground](#)

API REFERENCE

Introduction

Authentication

Making requests

Models

Completions

Chat

Edits

Images

Embeddings

Audio

Files

Fine-tunes

Moderations

Engines

Parameter details

Introduction

You can interact with the API through HTTP requests from any language, via our official Python bindings, our official Node.js library, or a [community-maintained library](#).

To install the official Python bindings, run the following command:

```
pip install openai
```

To install the official Node.js library, run the following command in your Node.js project directory:

```
npm install openai
```

Authentication

The OpenAI API uses API keys for authentication. Visit your [API Keys](#) page to retrieve the API key you'll use in your requests.

Remember that your API key is a secret! Do not share it with others or expose it in any client-side code (browsers, apps). Production requests must be routed through your own backend server where your API key can be securely loaded from an environment variable or key management service.

¹ <https://platform.openai.com/docs/api-reference>

Creating an OpenAI API key

Create an OpenAI account

1) Go to the API signup page →

<https://platform.openai.com/signup>

2) Create your account (you'll need to provide your *email address* and your *phone number*)

OpenAI often provides free trial credit

Create your account

Please note that phone verification is required for signup. Your number will only be used to verify your identity for security purposes.

Continue

Already have an account? [Log in](#)

OR



Continue with Microsoft Account



Continue with Google

Creating an OpenAI API key

- 3) Go to the API keys page → <https://platform.openai.com/account/api-keys>
- 4) Create a new secret key and **copy** it (if you lose it, delete the key and create a new one)

NAME	KEY	CREATED	LAST USED ⓘ	
Secret key	sk- . . . Vpp5	5 Feb 2023	25 Apr 2023	 
+ Create new secret key				

Note: DataCamp doesn't store API keys used in the exercises

Making a request

```
import openai

openai.api_key = "ENTER YOUR KEY HERE"

response = openai.Completion.create(
    model="gpt-3.5-turbo-instruct",
    prompt="What is the OpenAI API?"
)

print(response)
```

The response

- JSON (JavaScript Object Notation) response

```
{
  "choices": [
    {
      "finish_reason": "stop",
      "index": 0,
      "logprobs": null,
      "text": "\n\nOpenAI is an artificial intelligence research laboratory that focuses on developing machine learning algorithms with the goal of advancing artificial intelligence technology. The OpenAI API is a set of tools, services, and data that can be used to create, train, and deploy models. With the OpenAI API, developers have access to advanced AI algorithms, datasets, pre-trained models, and tools to help them create applications powered by artificial intelligence."
    }
  ],
  "created": 1682437639,
  "id": "cml-79FA7HqtdlQ1DDQIyvrkKLqFRThX",
  "model": "gpt-3.5-turbo-instruct",
  "object": "text_completion",
  "usage": {
    "completion_tokens": 86,
    "prompt_tokens": 7,
    "total_tokens": 93
  }
}
```

Interpreting the response

```
print(response["choices"])
```

```
[<OpenAIObject at 0x7f3146559c70> JSON: {  
  "finish_reason": "stop",  
  "index": 0,  
  "logprobs": null,  
  "text": "\n\nOpenAI is an artificial intelligence research laboratory that focuses  
on developing machine learning algorithms with the goal of advancing artificial  
intelligence technology. The OpenAI API is a set of tools, services, and data that  
can be used to create, train, and deploy models. With the OpenAI API, developers  
have access to advanced AI algorithms, datasets, pre-trained models, and tools to  
help them create applications powered by artificial intelligence."  
}]
```

Interpreting the response

```
print(response["choices"][0])
```

```
{  
  "finish_reason": "stop",  
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}
```

Interpreting the response

```
print(response["choices"][0]["text"])
```

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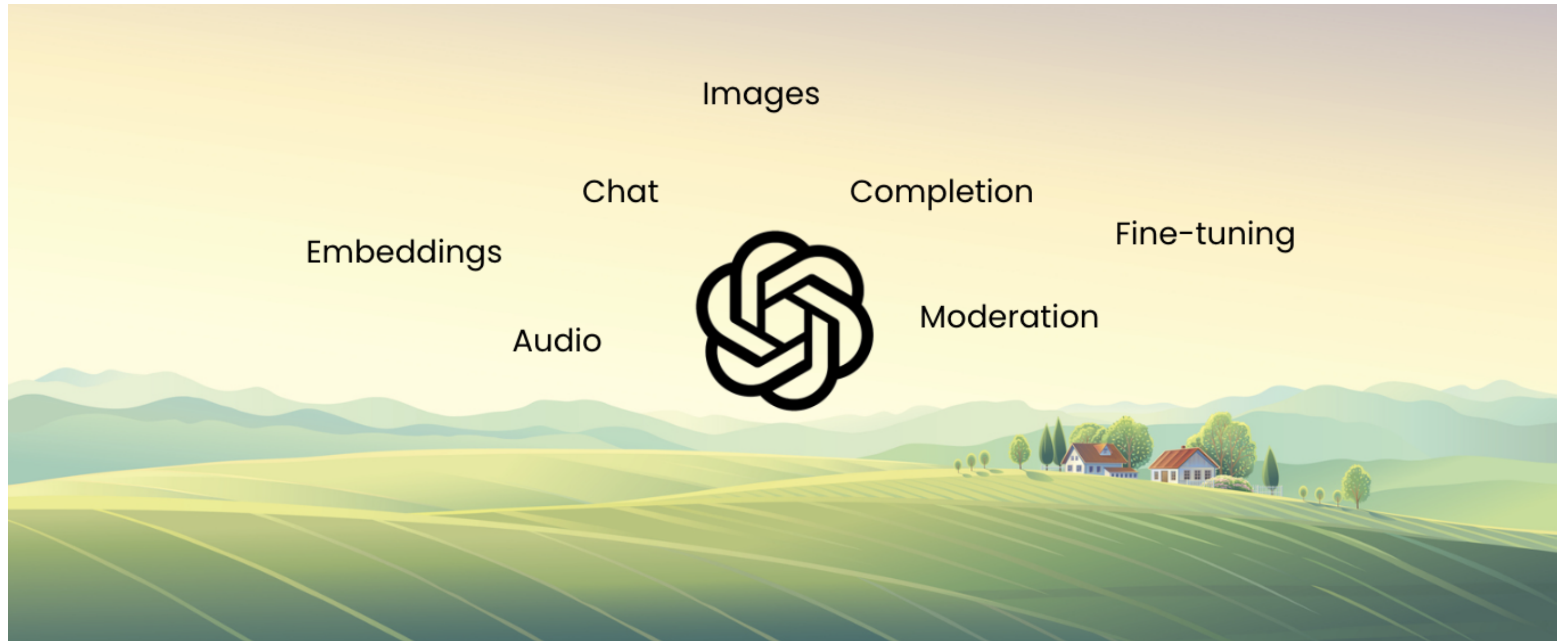
The OpenAI developer ecosystem

WORKING WITH THE OPENAI API

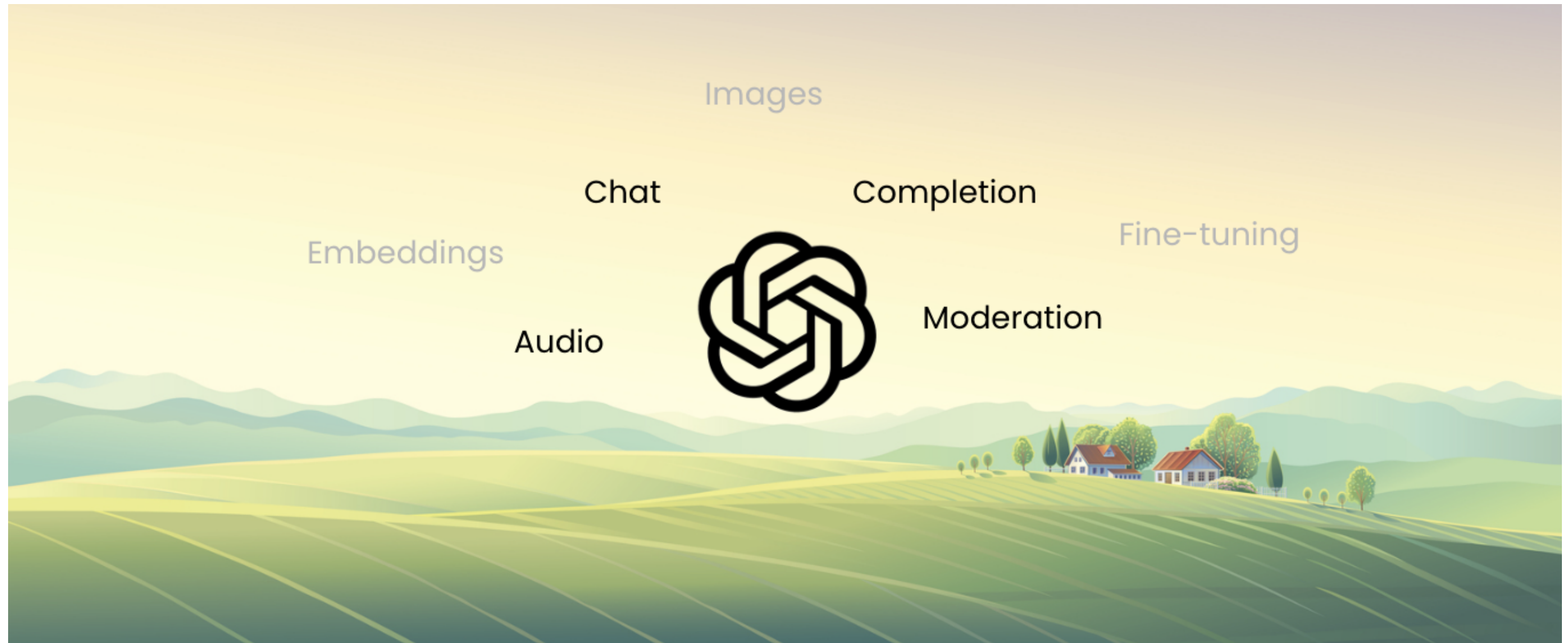
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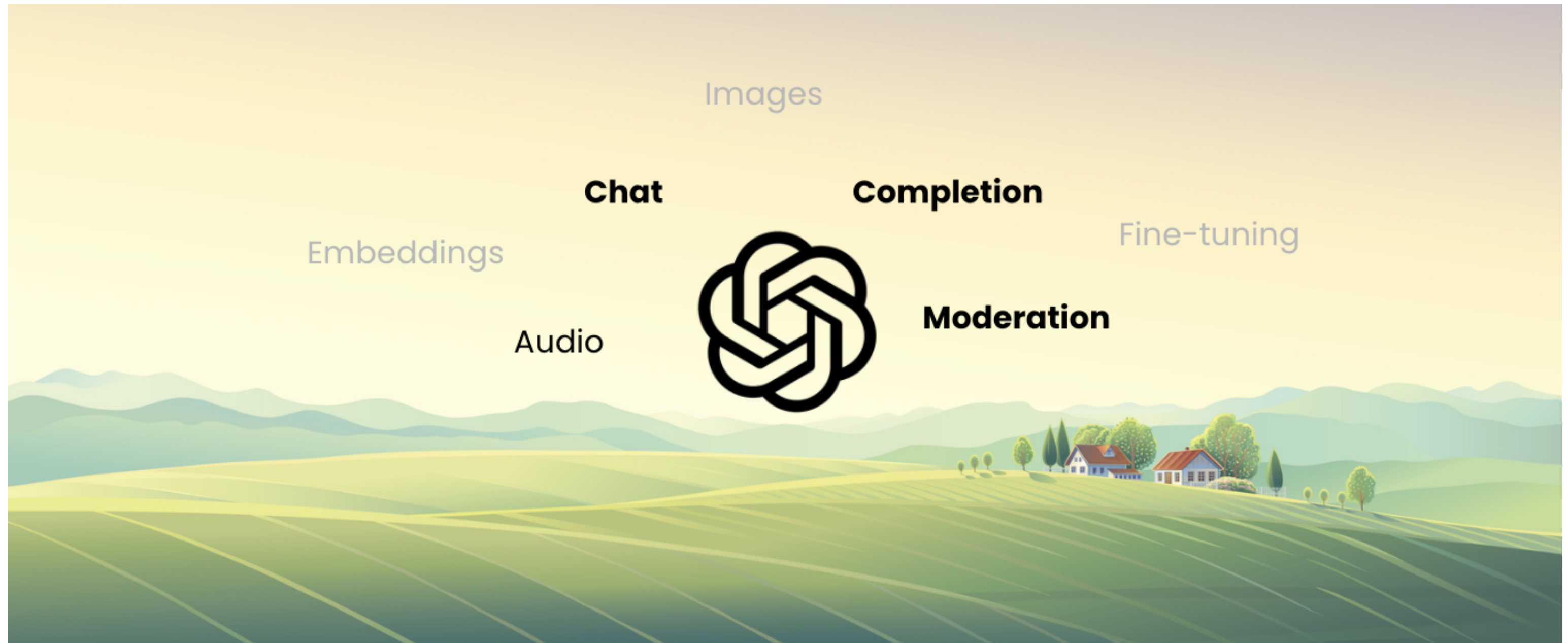
The OpenAI landscape



The OpenAI landscape

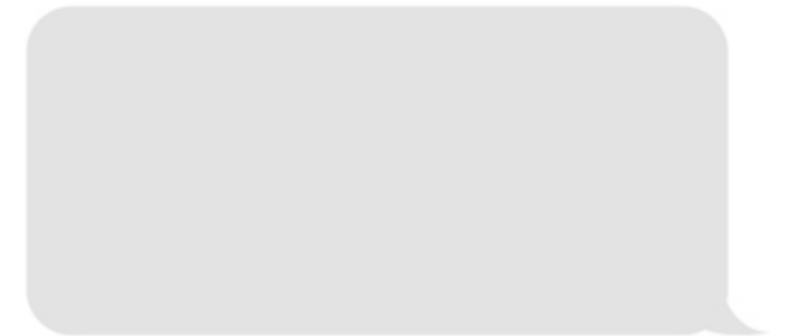


The OpenAI landscape



Completions

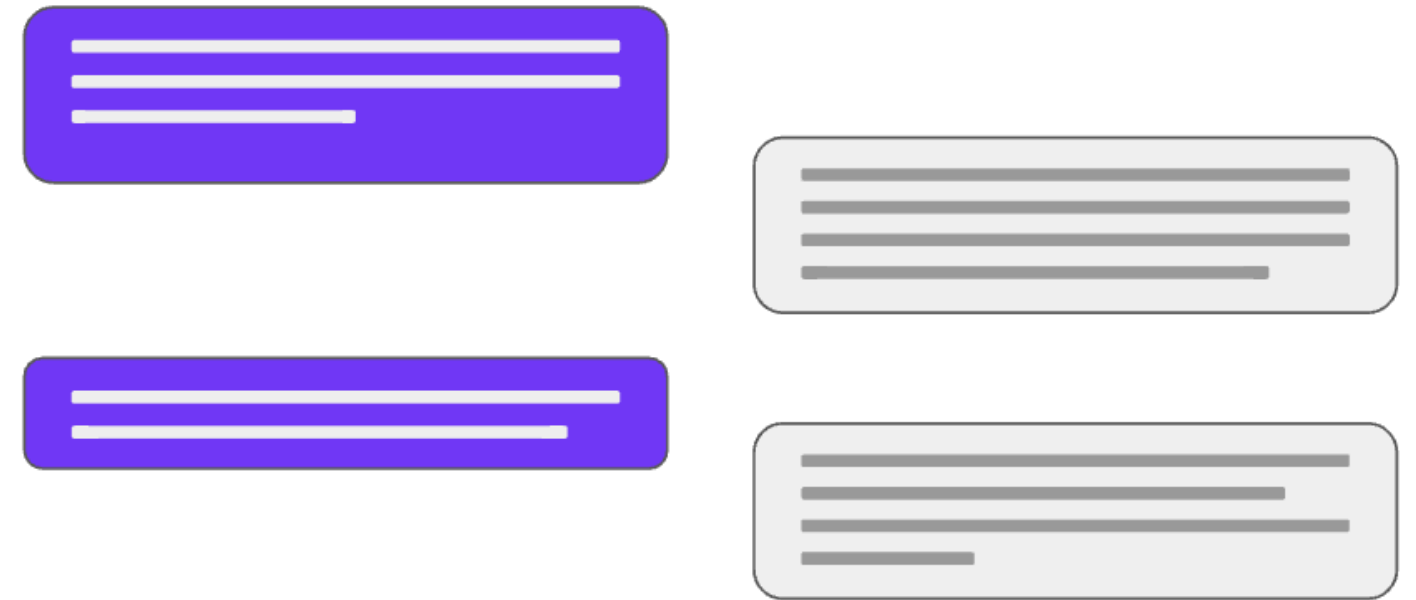
- Receive *continuation* of a prompt
- *Single-turn tasks*
 - Answer questions
 - Classification into categories
 - Sentiment analysis
 - Explain complex topics



```
response = openai.Completion.create(  
    model="gpt-3.5-turbo-instruct",  
    prompt="Insert prompt to complete."  
)
```

Chat

- *Multi-turn conversations*
 - Ideation
 - Customer support assistant
 - Personal tutor
 - Translate languages
 - Write code
- Also performs well on *single-turn* tasks
- Available through `openai.ChatCompletion`
→ Chapter 2



Moderation

- Check content for *violations* of OpenAI's *usage policies*, including:
 - Inciting violence
 - Hate speech
- Can *customize model sensitivity* to specific violations



¹ <https://openai.com/policies/usage-policies> ² <https://platform.openai.com/docs/guides/moderation/overview>

Organization settings

Organization name

Human-friendly label for your organization, shown in user interfaces

Organization ID

Identifier for this organization sometimes used in API requests

Save

- Better management of *access*, *billing*, and *usage limits*
- Users can be part of multiple organizations

¹ <https://platform.openai.com/account/org-settings>

Organizations

```
import openai

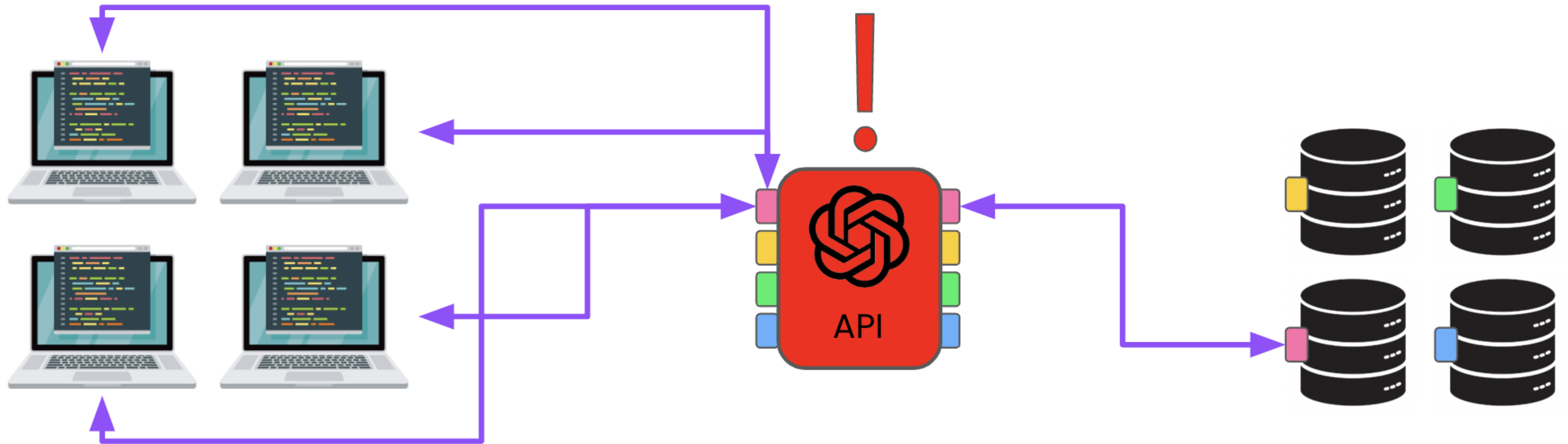
openai.api_key = "ENTER YOUR KEY HERE"
openai.organization = "ENTER ORG ID"

response = openai.Completion.create(
    model="gpt-3.5-turbo-instruct",
    prompt="What is the OpenAI API?"
)

print(response)
```

Rate limits

- Cap on *frequency* or *size* of API requests



¹ <https://platform.openai.com/docs/guides/rate-limits>

Organization structure



Organization

Customer Service Chatbot

Content Recommendation

Video Transcript Generator

Organization structure



Organization

Customer Service Chatbot

Content Recommendation

Video Transcript Generator



Organization 1

Customer Service Chatbot

Organization 2

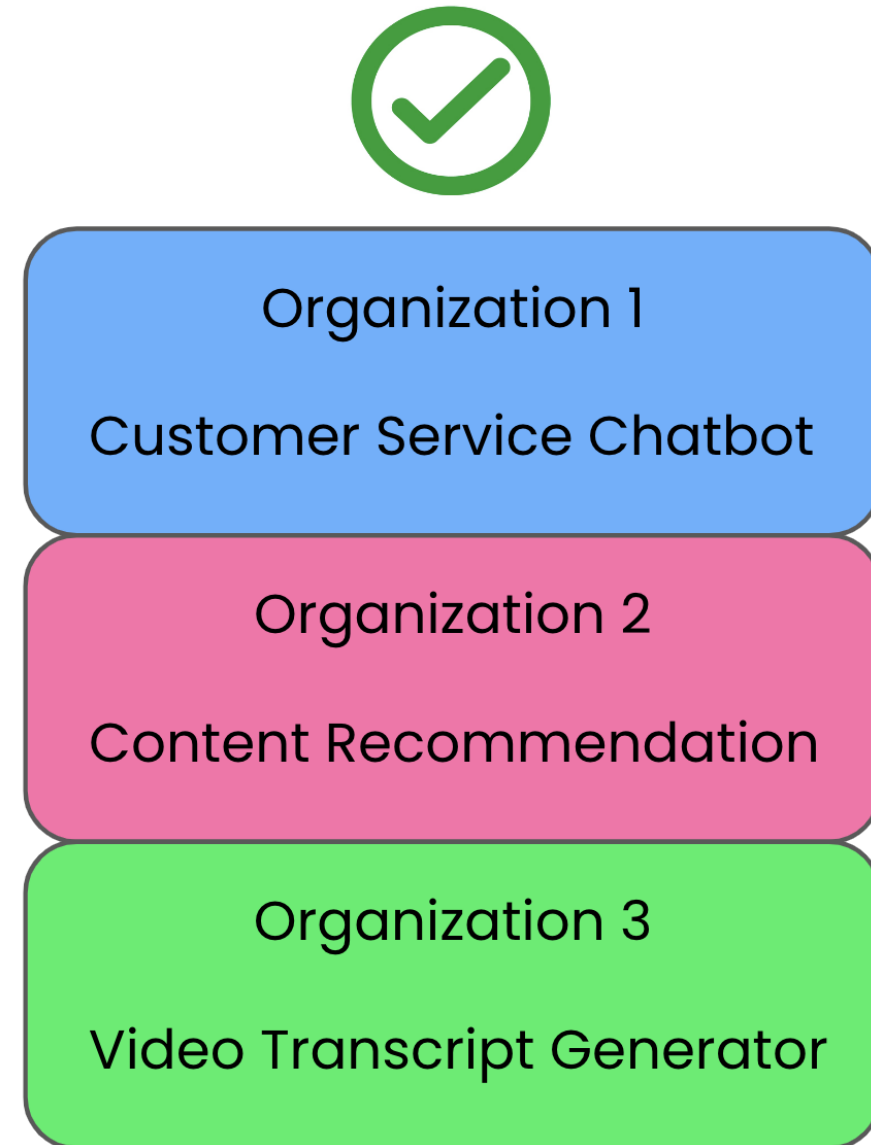
Content Recommendation

Organization 3

Video Transcript Generator

Organization structure

- Distributes requests across organizations
 - Reduced likelihood of hitting rate limits
- Removes *single failure point*
 - Issue with one organization doesn't break all features
- Better usage and billing management



Let's practice!
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