What is the OpenAI API?

WORKING WITH THE OPENAI API

James Chapman
Curriculum Manager, DataCamp

datacamp

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

[1] Image Credit: OpenAI

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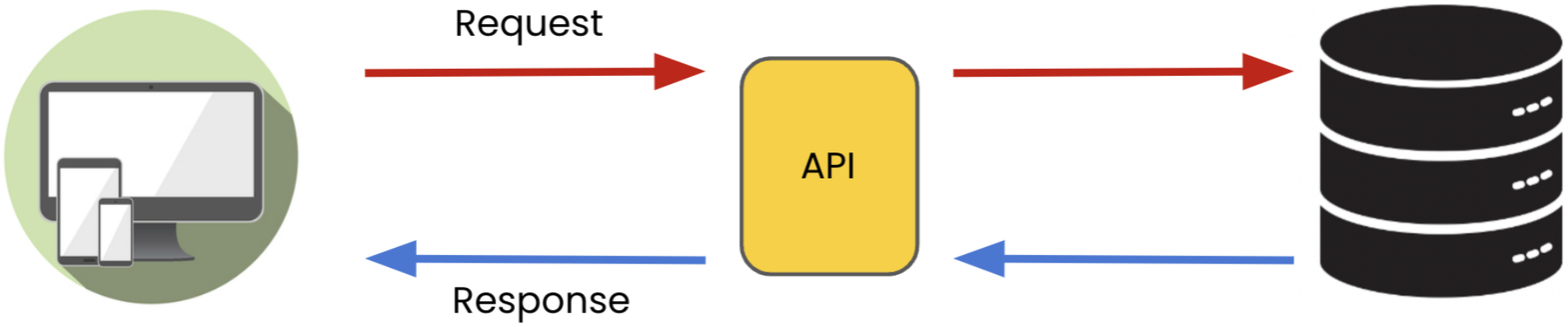
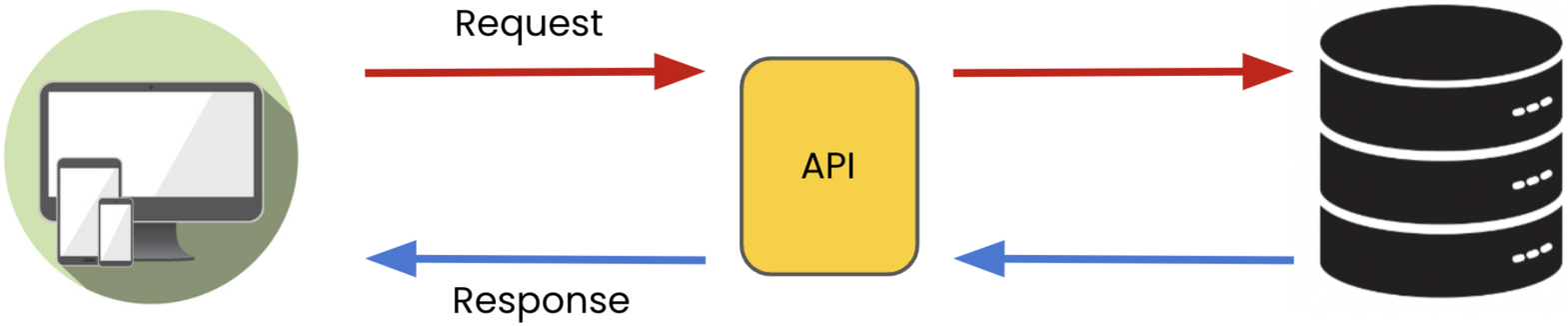
What is an API?

- Application Programming Interface

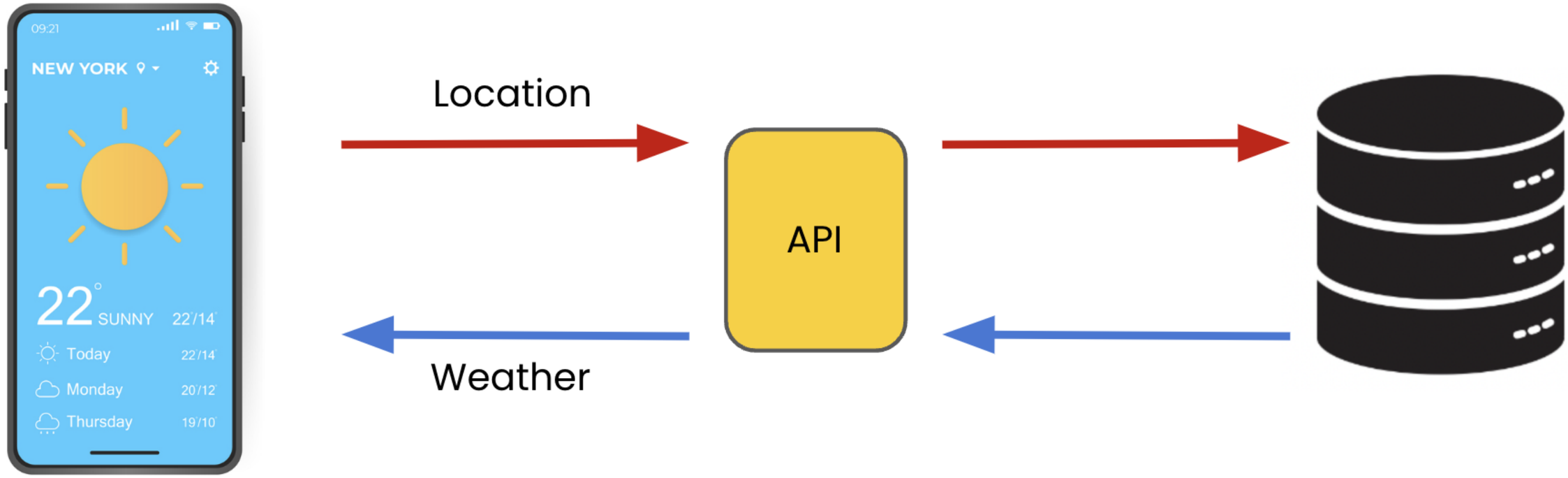


What is an API?

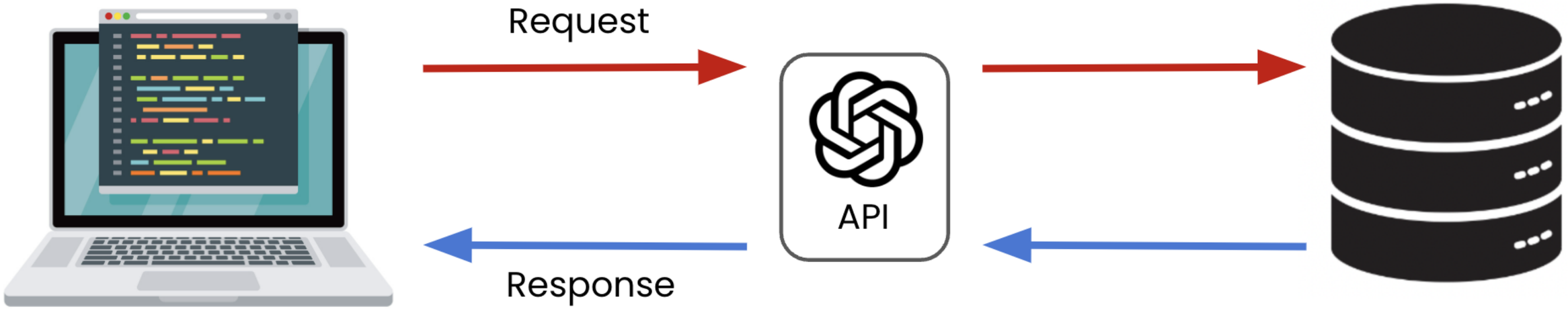
- Application Programming Interface



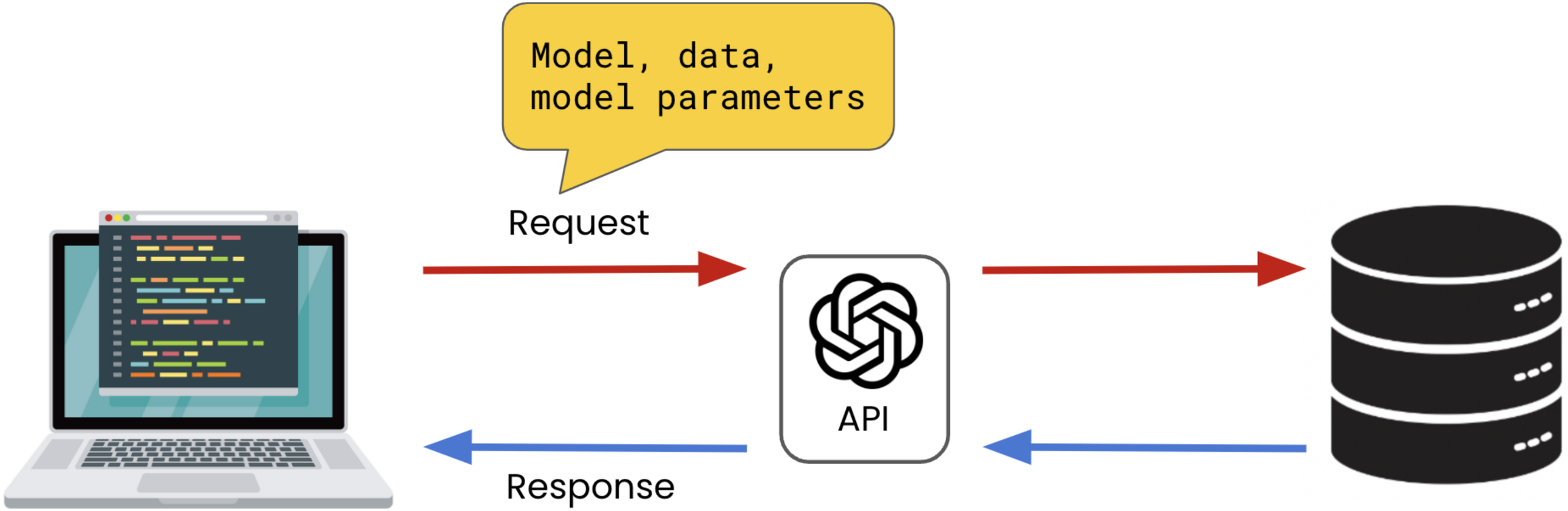
What is an API?



The OpenAI API

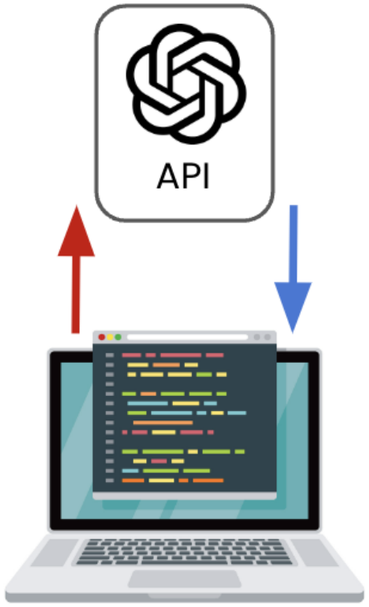


The OpenAI API

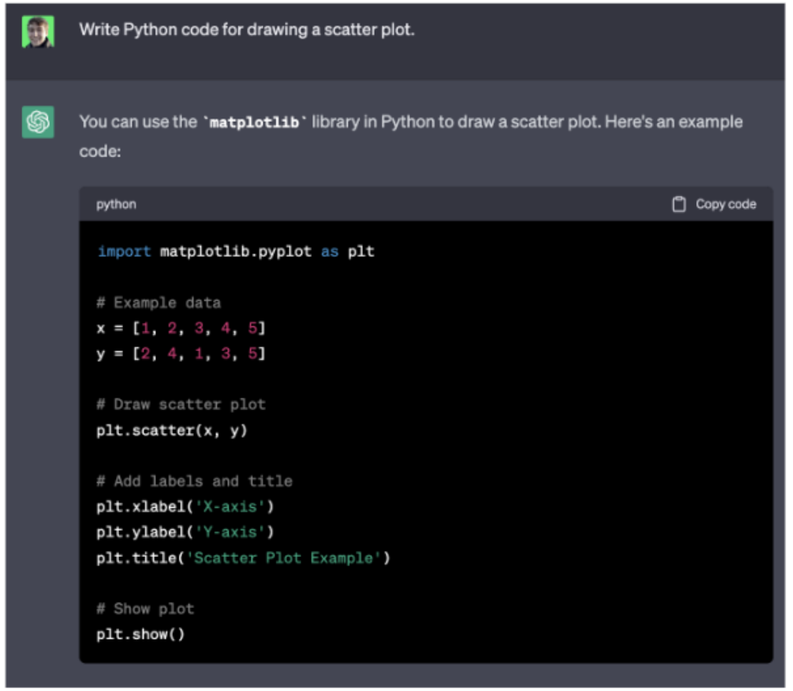


API vs. web interface

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

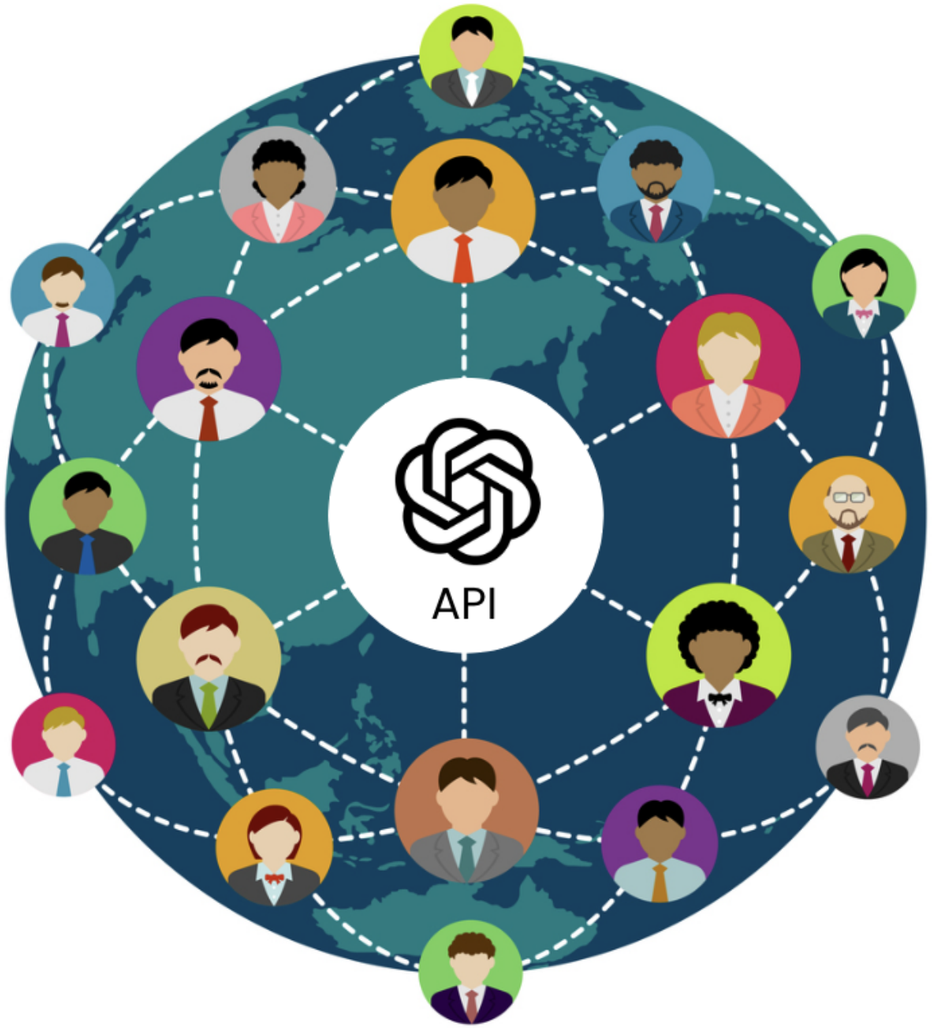


- Very little setup
- Sufficient for *streamlining* individual's workflows



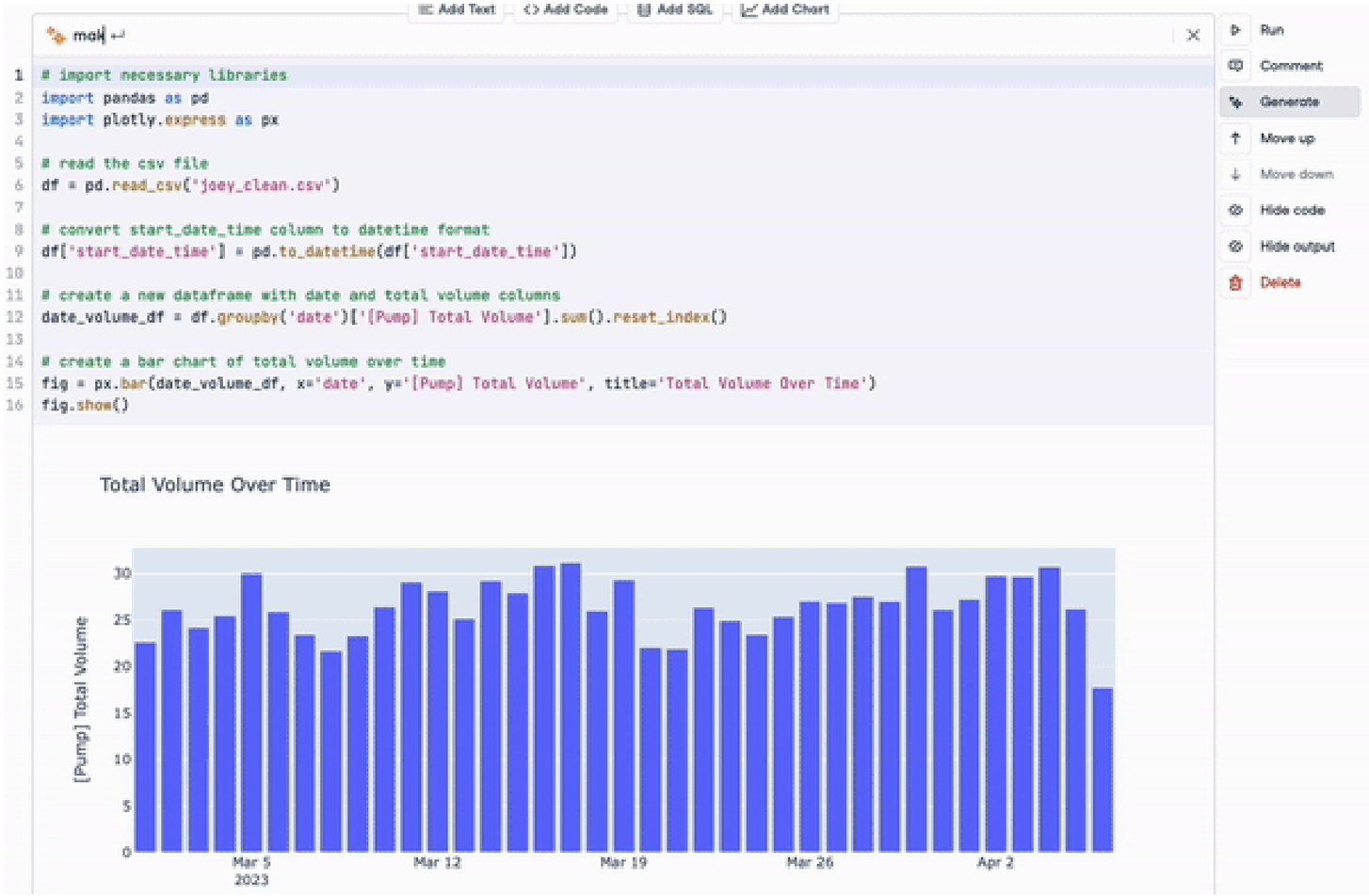
Why the OpenAI API?

- 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

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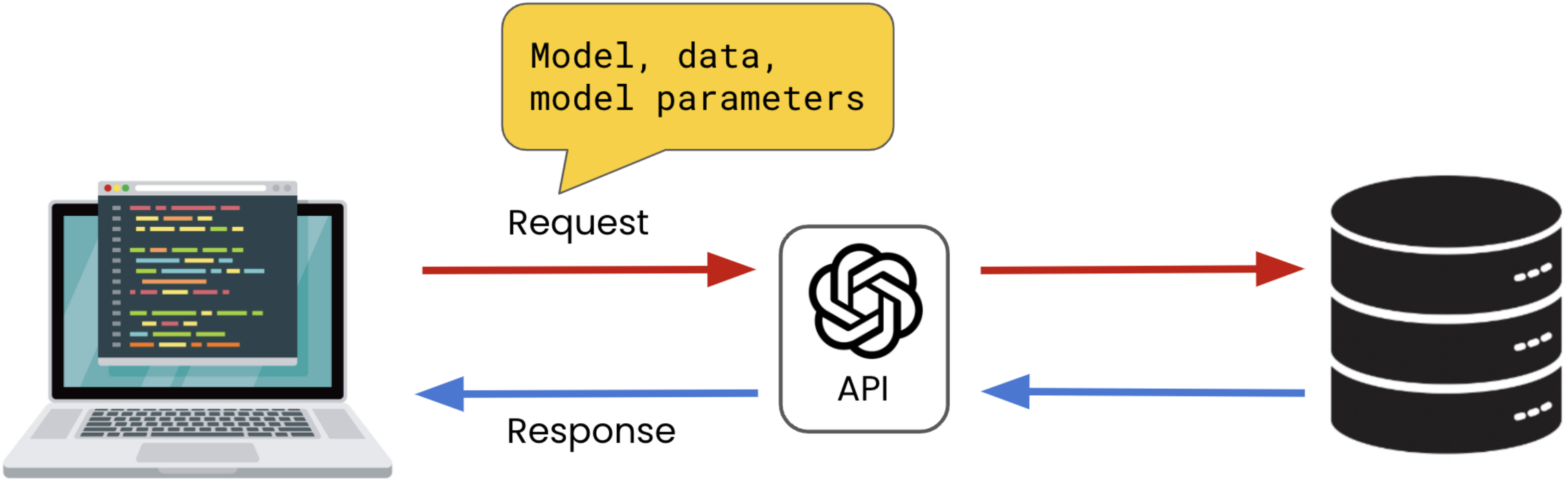
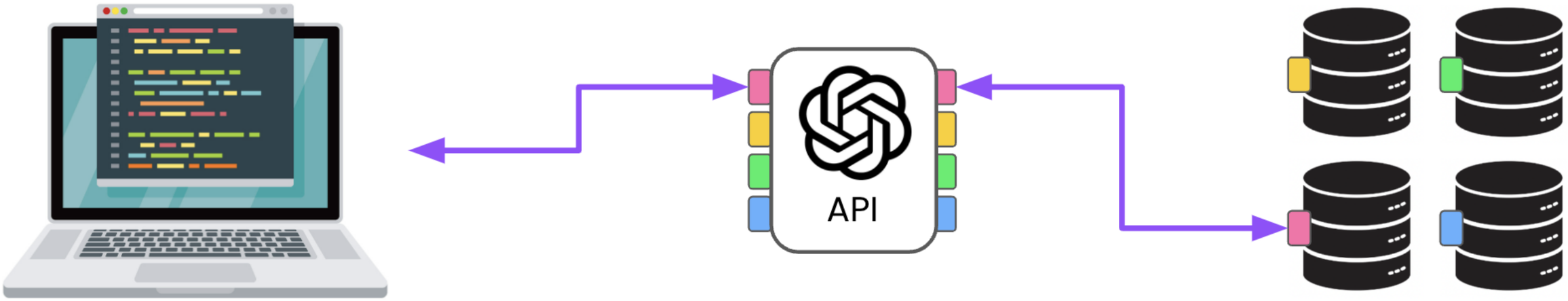
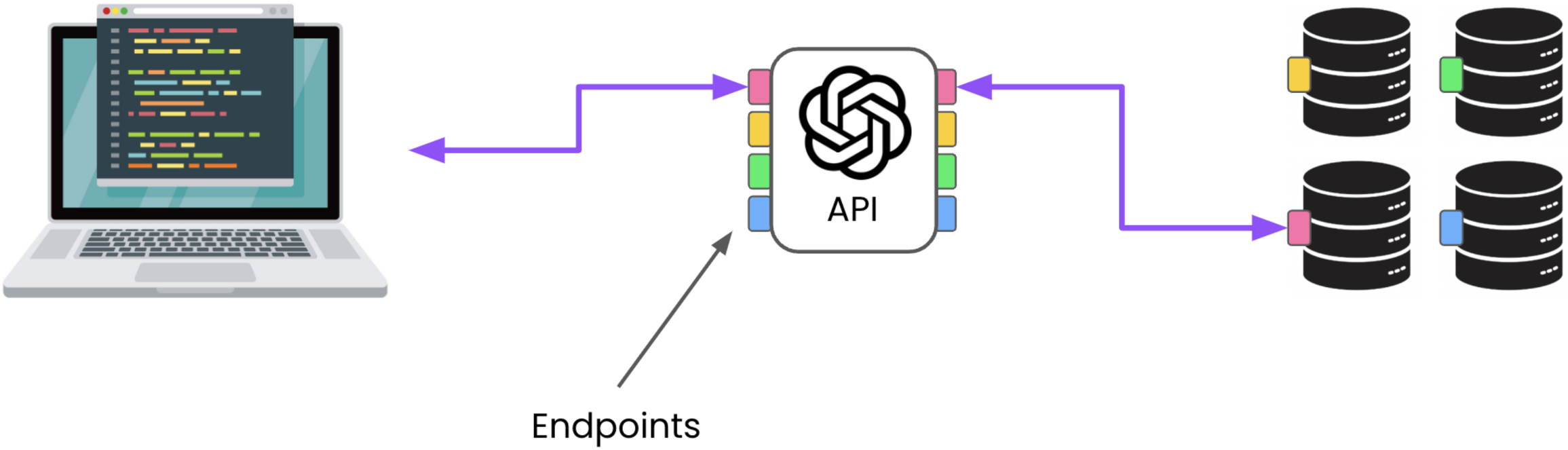
APIs recap...



API endpoints



API endpoints



API endpoints

- **Endpoints** → API access point designed for specific interactions

API authentication

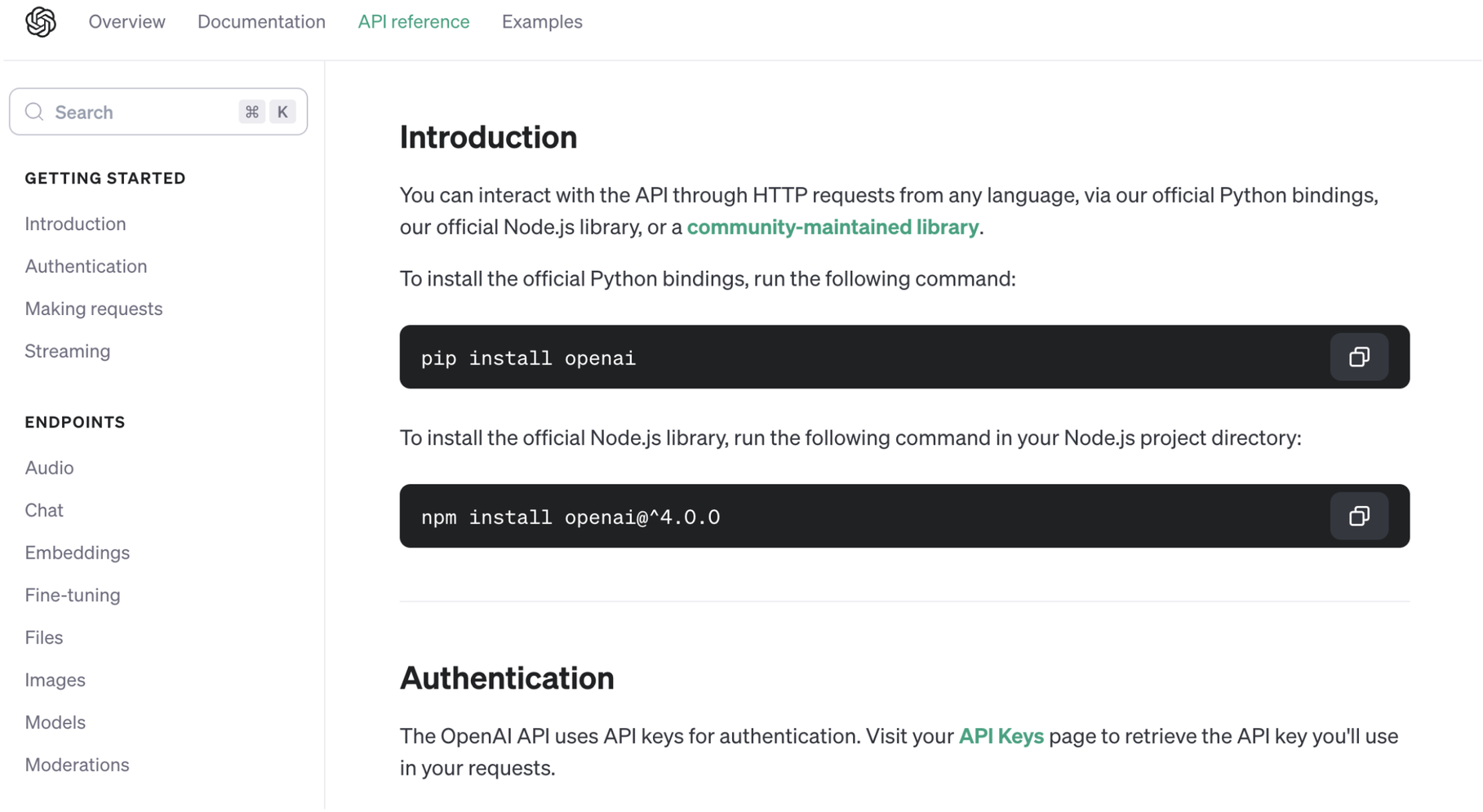
- **Authentication** → Controls on access to API endpoint services (often unique **key**)

API usage costs

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

[1] https://openai.com/pricing

API documentation



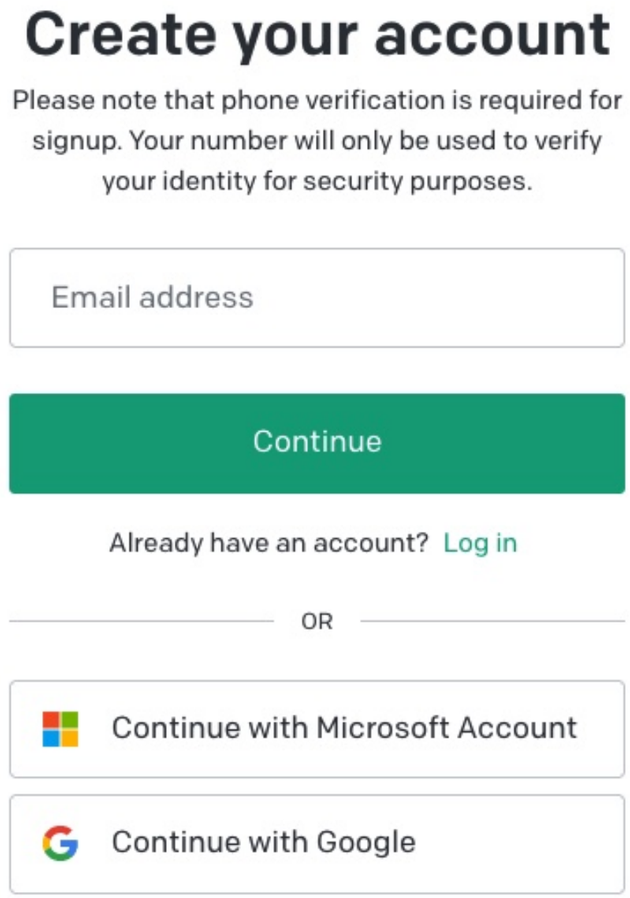
[1] https://platform.openai.com/docs/api-reference

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

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)

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

Making a request

```
from openai import OpenAI

client = OpenAI(api_key="ENTER YOUR KEY HERE")

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

print(response)
```

The response

```
Completion(id='cmpl-8SPzX0HgYV1emmoGN6MYjjaRJzkBR', choices=[CompletionChoice(finish_reason='length', index=0,
logprobs=None, text='\n\nThe OpenAI API is an application programming interface provided by OpenAI, a')],
created=1701783787, model='gpt-3.5-turbo-instruct', object='text_completion', system_fingerprint=None,
usage=CompletionUsage(completion_tokens=16, prompt_tokens=7, total_tokens=23))
```

Additional spacing:

```
Completion(id='cmpl-8S0D6VZBpM8Vy0fZf6atE71b1Zdvm',
           choices=[CompletionChoice(finish_reason='length', index=0, logprobs=None,
                                     text='\n\nThe OpenAI API is an application programming interface provided by OpenAI, a')],
           created=1701684684,
           model='gpt-3.5-turbo-instruct',
           object='text_completion',
           system_fingerprint=None,
           usage=CompletionUsage(completion_tokens=16, prompt_tokens=7, total_tokens=23))
```

Interpreting the response

```
print(response.choices)
```

```
[CompletionChoice(finish_reason='length', index=0, logprobs=None,
  text='\n\nThe OpenAI API is an application programming interface provided by OpenAI, a')]
```

Interpreting the response

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

```
CompletionChoice(finish_reason='length', index=0, logprobs=None,
  text='\n\nThe OpenAI API is an application programming interface provided by OpenAI, a')
```

Interpreting the response

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

```
The OpenAI API is an application programming interface provided by OpenAI, a
```

Converting the response into a dictionary

```
print(response.model_dump())
```

```
{'id': 'cmpl-8S0KeXQsQVl9i9CagkHZjb2Ujhy2A',
 'choices': [{'finish_reason': 'length', 'index': 0, 'logprobs': None,
              'text': '\n\nThe OpenAI API is an application programming interface provided by OpenAI, a'}],
 'created': 1701685152,
 'model': 'gpt-3.5-turbo-instruct',
 'object': 'text_completion',
 'system_fingerprint': None,
 'usage': {'completion_tokens': 16, 'prompt_tokens': 7, 'total_tokens': 23}
}
```

Let's practice!

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The OpenAI developer ecosystem

WORKING WITH THE OPENAI API

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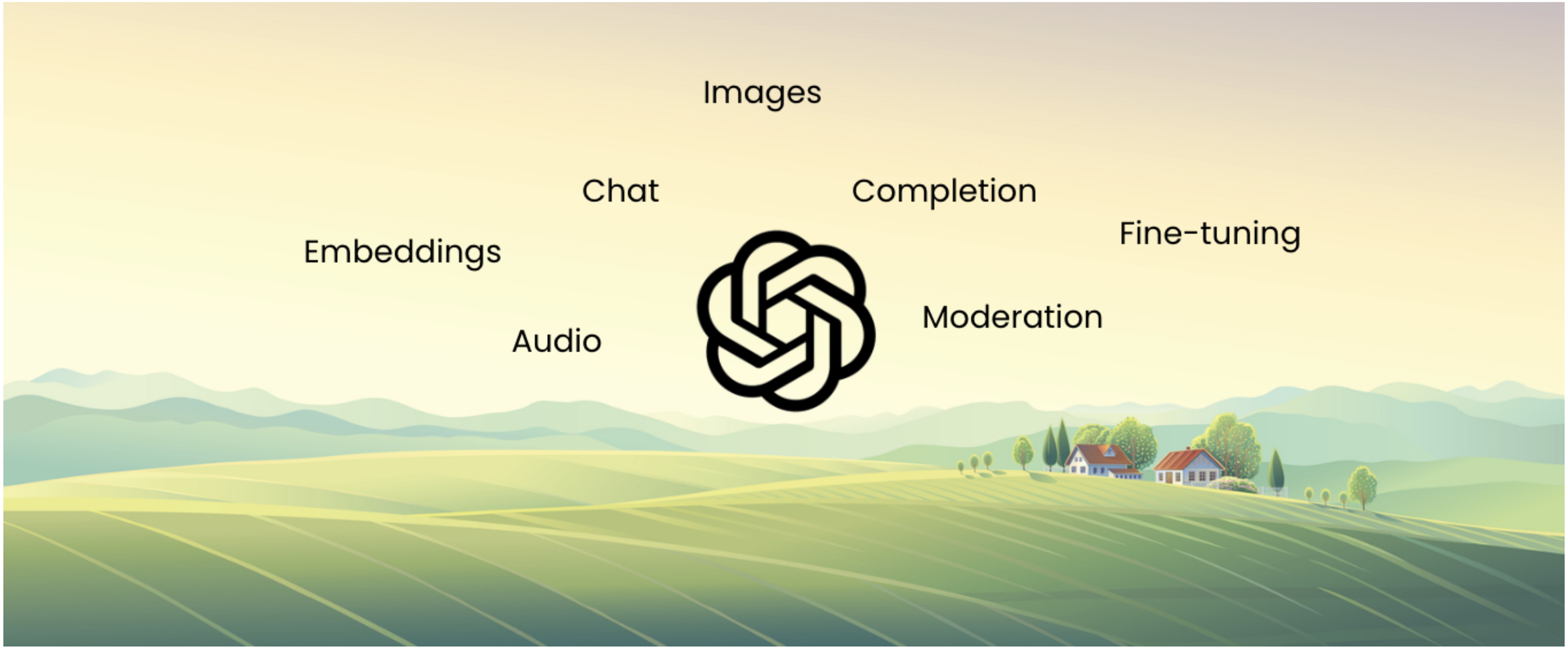
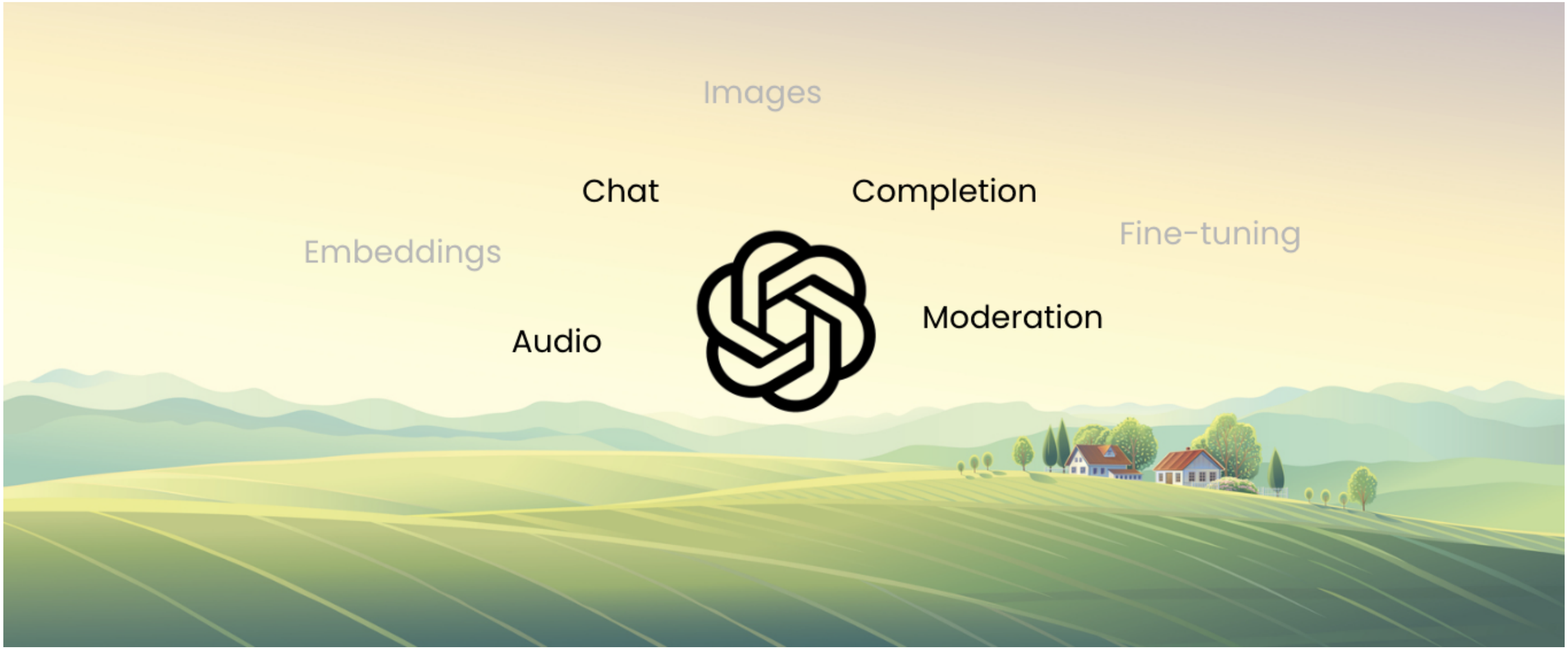
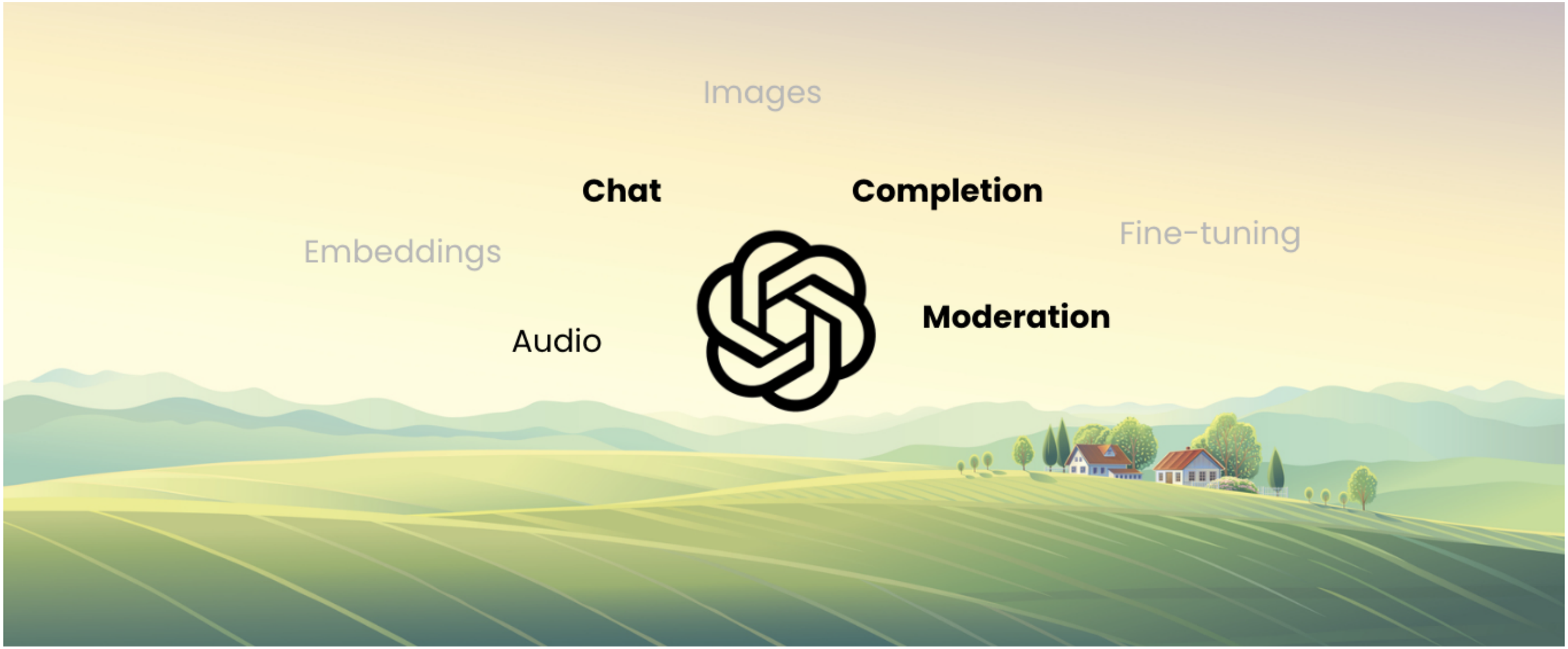
The OpenAI landscape



The OpenAI landscape

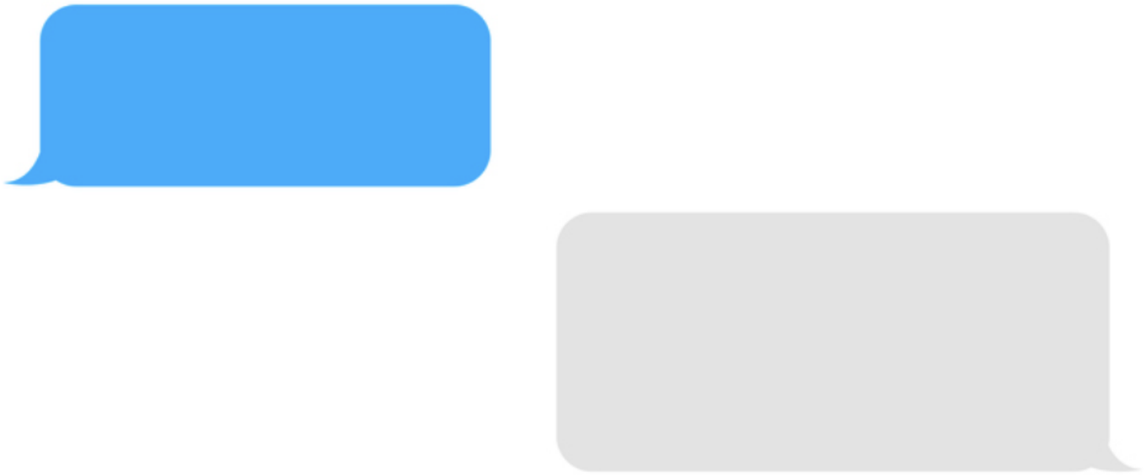


The OpenAI landscape



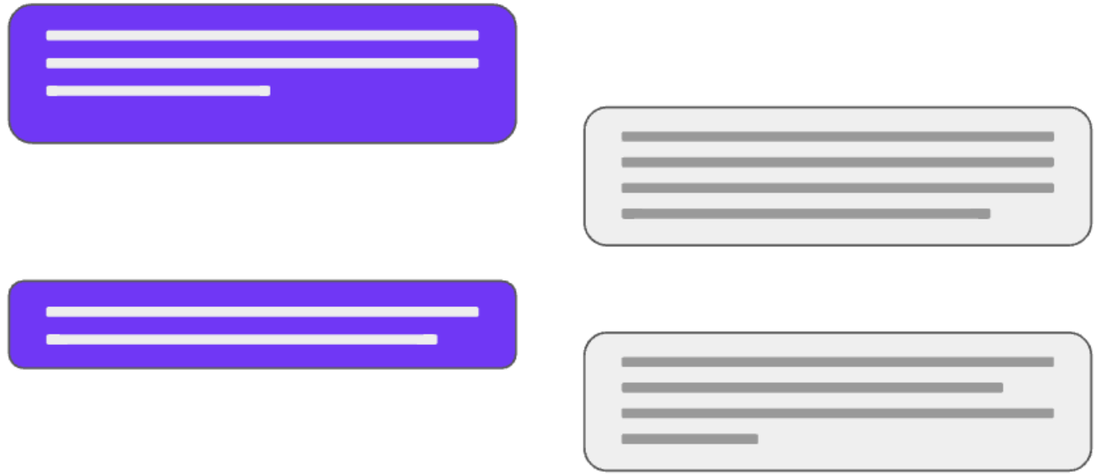
Completions

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



Chat

- *Multi-turn conversations*
  - Ideation
  - Customer support assistant
  - Personal tutor
  - Translate languages
  - Write code
- Also performs well on *single-turn* tasks

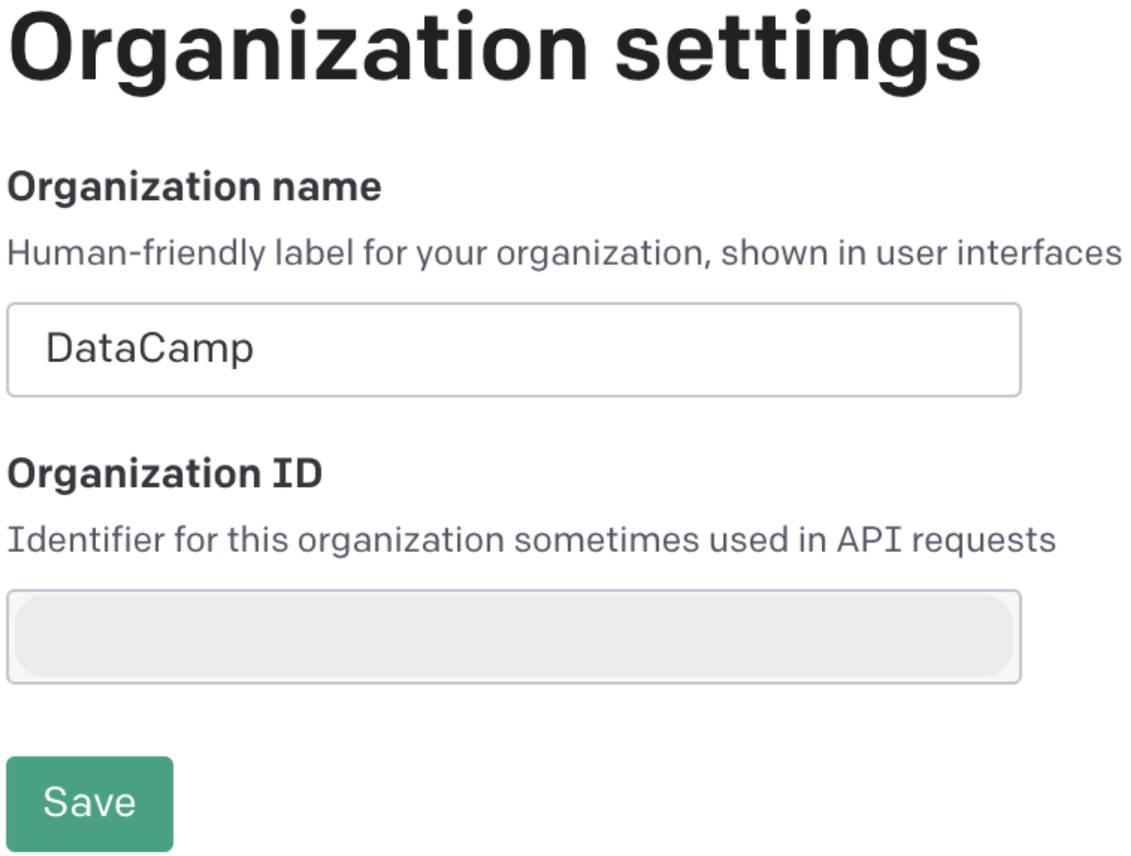


- Chat completions → **Chapter 2**

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



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

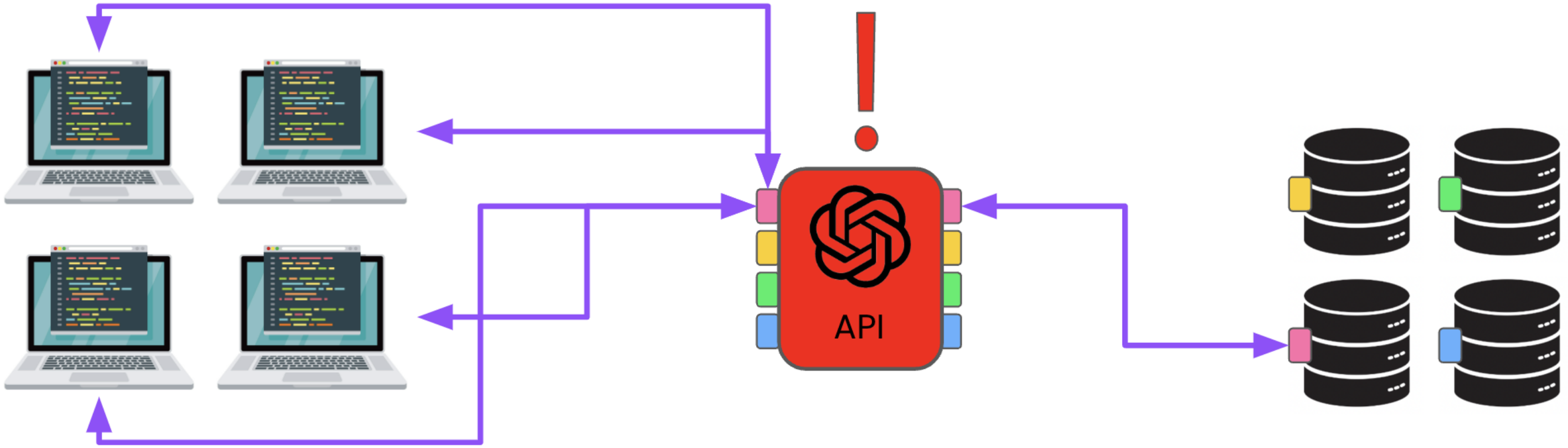
[1] https://platform.openai.com/account/org-settings

Organizations

```
from openai import OpenAI

client = OpenAI(api_key="ENTER YOUR KEY HERE",
                organization = "ENTER ORG ID")

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

print(response)
```

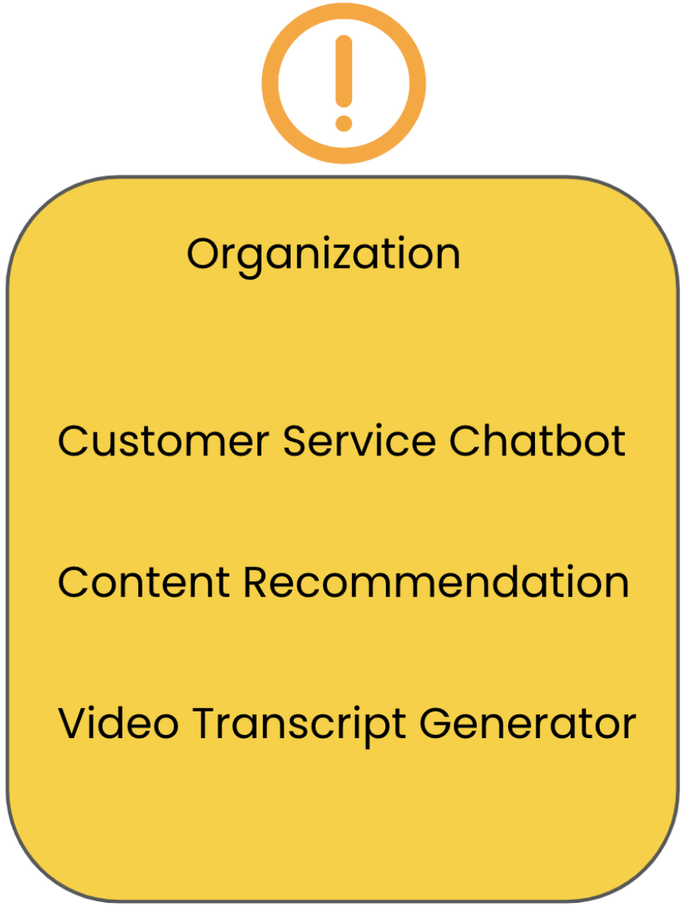
Rate limits

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

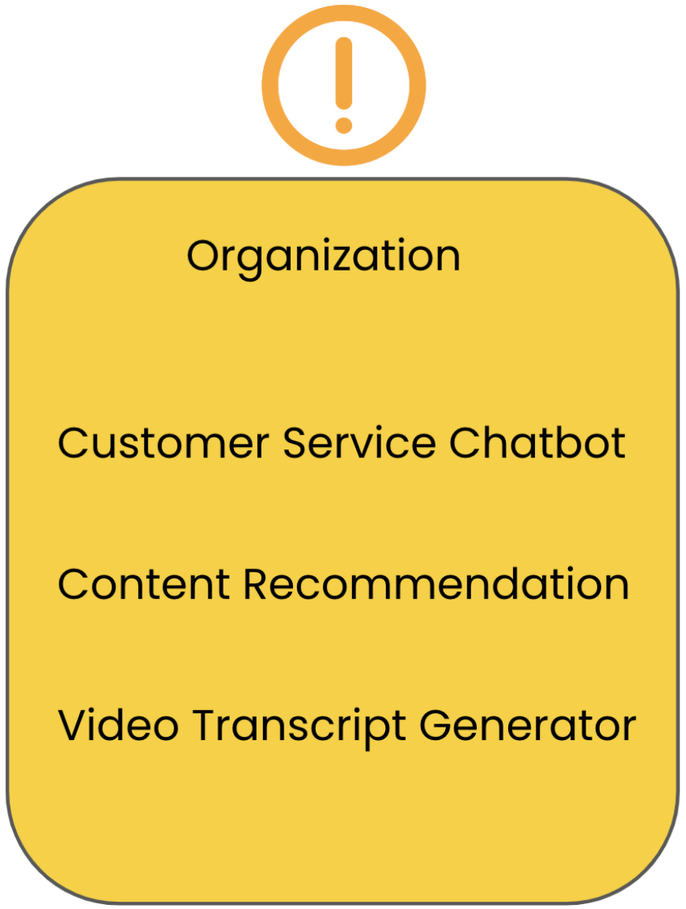


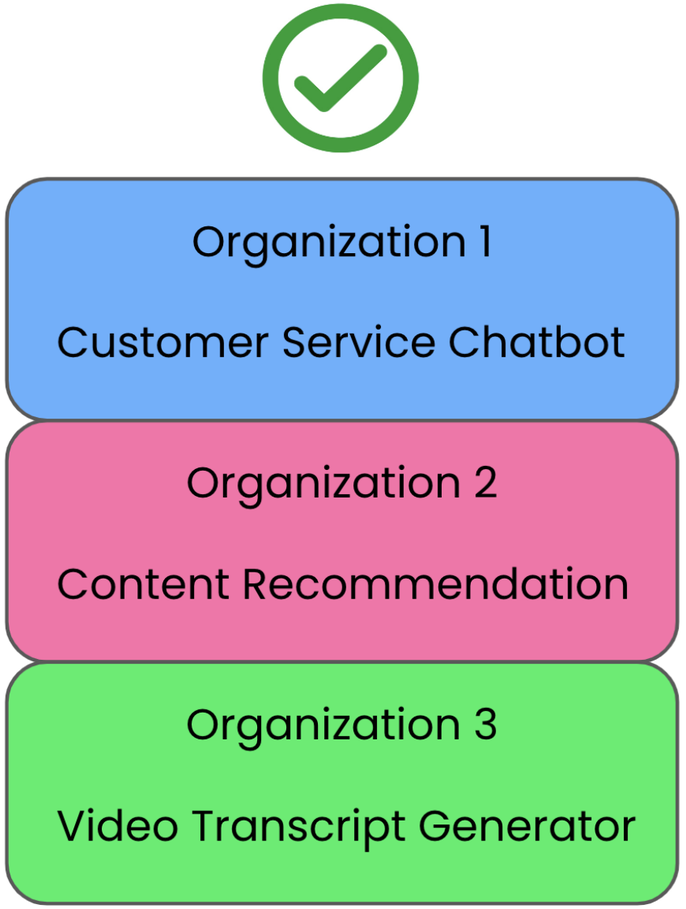
[1] https://platform.openai.com/docs/guides/rate-limits

Organization structure



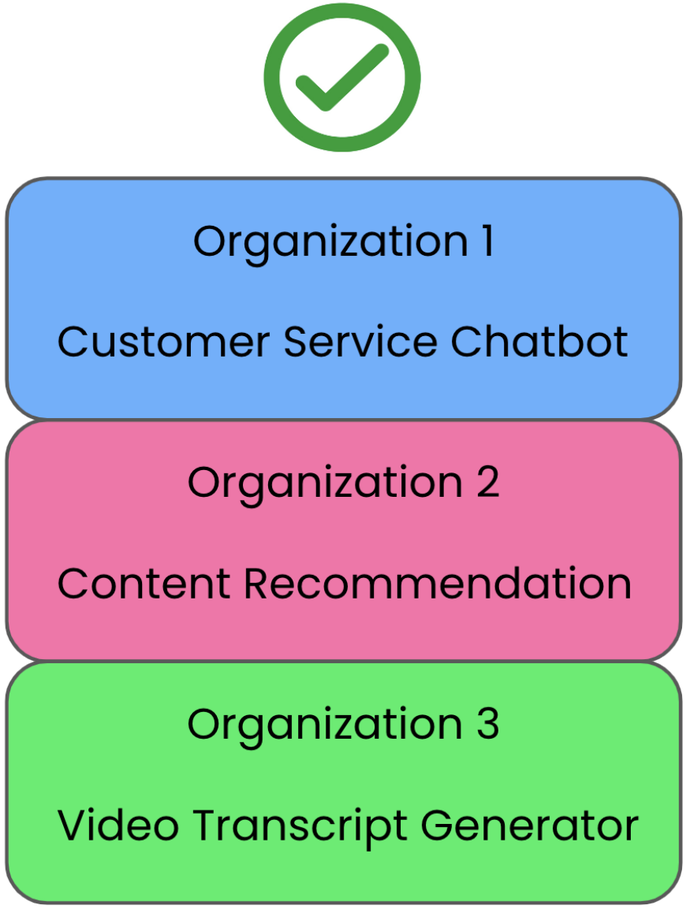
Organization structure





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



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