

跟 OpenAI API 互動

OpenAI API 注意事項





使用 OpenAI API 必須知道的事情

OpenAI 會使用拿到的資料嗎？

- ① **API 類的服務**：OpenAI 目前不會拿 API 類服務所得到的資料做訓練。
- ② **非 API 類的服務**：包括 ChatGPT、DALL-E 等，會把拿到的資料拿去做訓練，會經過一些處理回饋給 model 繼續增進能力。
- ③ 如果想要 / 不想要自己輸入的資料被拿去訓練，OpenAI 目前都有提供表格可以填寫。





OpenAI API 的收費方式

- ① **Tokens 的使用量**：依照不同模型而有不同費用
- ② **計費方式**：可查詢官方網站 <https://openai.com/pricing>
- ③ **摘要 GPT 費用**：

基礎模型 (Base models, GPT-3) 的費用參考如下：

模型	說明	費用
davinci-002	功能較強，回應品質較好。	US\$2.00 / 1M tokens
babbage-002	能夠執行簡單的任務，速度快，成本低。	US\$0.40 / 1M tokens

費用更新日：2024/05/05



OpenAI API 的收費方式

影響收費的因素：

① **API endpoint**

文字依照 tokens；圖片依照大小及張數；音訊依照長度。

② **Model 模型的選擇**

Chat endpoint 可選 GPT-3.5 或 GPT-4 的模型，不過價錢差了20倍。

③ **Input / Output**

Model	Input	Output
gpt-3.5-turbo-0125	US\$0.50 / 1M tokens	US\$1.50 / 1M tokens
gpt-4-turbo-2024-04-09	US\$10.0 / 1M tokens	US\$30.0 / 1M tokens

費用紀錄日：2024/05/05

參考來源：<https://openai.com/pricing>

跟 OpenAI API 互動

OpenAI API 種類





API endpoints

- ① **主要的 API endpoints**：目前 OpenAI 提供了五組主要的 API endpoints，以及其他輔助用的 API endpoints。API endpoints 履行請求，就是 API 呼叫的地方。
- ② **API 必有文件，才可作用**：文件會指出 API 接受的請求類型、API 能做的事、API 如何將回應格式化以及其端點為何。
- ③ **建置應用時需參考API文件**：開發人員在建置應用程式時，可以查看 API 的文件並且將此資訊涵蓋在內。





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OpenAI API



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OpenAI

<https://openai.com> › [blog](#) › [openai-api](#) · [翻譯這個網頁](#)

OpenAI API ✓

2020年9月18日 — We've designed the **API** to be both simple for anyone to use but also flexible enough to make machine learning teams more productive. In fact, ...



OpenAI

<https://platform.openai.com> · [翻譯這個網頁](#)

OpenAI API: Overview ✓

Explore resources, tutorials, **API** docs, and dynamic examples to get the most out of **OpenAI's** developer platform.



Medium

<https://medium.com> › [openai-api-入門-那些你需要知道...](#)

OpenAI API 入門— 那些你需要知道的事. ... ✓



如果有 ChatGPT 的帳號，就可以直接登入



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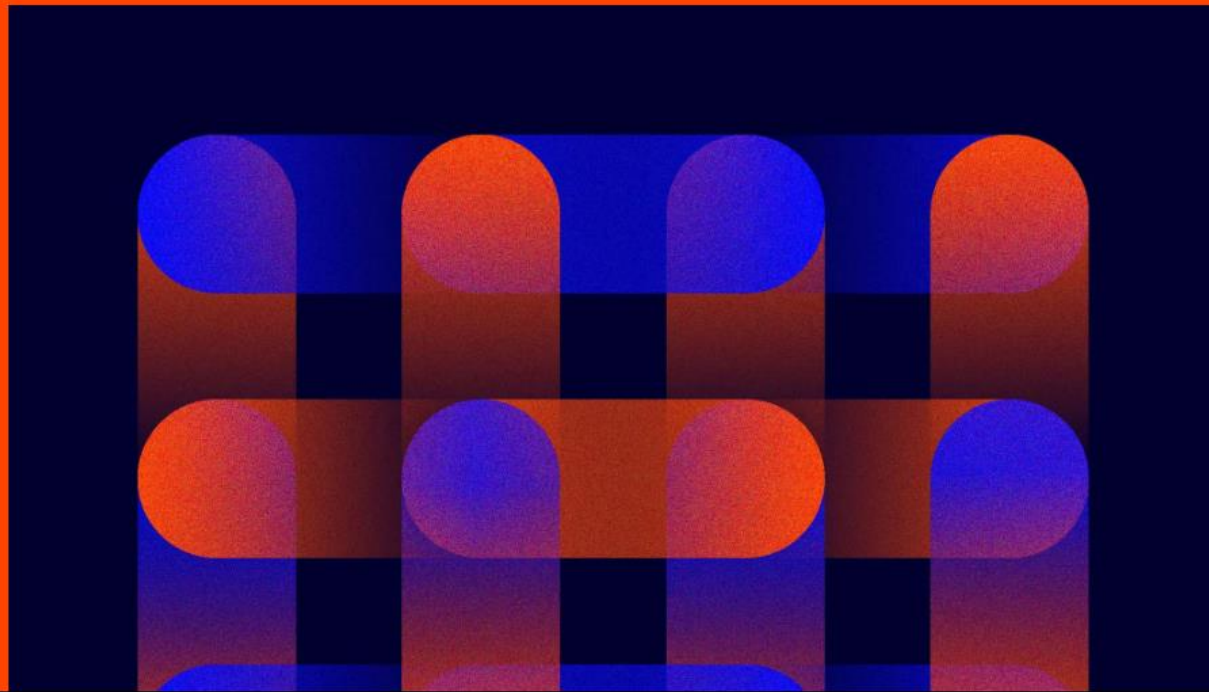
Blog

OpenAI API

We're releasing an API for accessing new AI models developed by OpenAI.

[Sign up](#)

[Explore the API](#)





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Streaming is now available in the Assistants API. [Learn more](#)

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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@^4.0.0
```



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.



找到 ENDPOINTS 及其種類



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Authentication

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Chat (對話)



Audio

- Chat**
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- The chat completion object
- The chat completion chunk object

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Messages

Chat

Given a list of messages comprising a conversation, the model will return a response.

Related guide: [Chat Completions](#)

Create chat completion

- Default
- Image input
- Streaming
- Functions
- Logprobs

POST <https://api.openai.com/v1/chat/completions>

Creates a model response for the given chat conversation.

Request body

messages array **Required**

A list of messages comprising the conversation so far. [Example](#)

[Python code.](#)

▼ Show possible types

model string **Required**

```
Example request      gpt-3.5-turbo  curl  [copy icon]
1  curl https://api.openai.com/v1/chat/completion
2  -H "Content-Type: application/json" \
3  -H "Authorization: Bearer $OPENAI_API_KEY" \
4  -d '{
5    "model": "gpt-3.5-turbo",
6    "messages": [
7      {
8        "role": "system",
9        "content": "You are a helpful assistant"
10     },
11     {
```



Chat (對話)

- ① 簡單來說就是：給 OpenAI 一串話，OpenAI 的 model 就會回應，也就是大家熟知的 ChatGPT 的功能。
- ② 區別在於，沒有 Web UI 可以使用。
- ③ 要注意的是，OpenAI 之下，這個功能不會記住上一次的對話。所以如果要連續對話，需要把之前的內容也一起回傳回去。



Image (圖案)

P

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Create image edit

Create image variation

The image object

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Images

Given a prompt and/or an input image, the model will generate a new image.

Related guide: [Image generation](#)

Create image

POST <https://api.openai.com/v1/images/generations>

Creates an image given a prompt.

Request body

prompt string **Required**

A text description of the desired image(s). The maximum length is 1000 characters for `dall-e-2` and 4000 characters for `dall-e-3`.

model string Optional Defaults to dall-e-2

Example request

curl

```
1 curl https://api.openai.com/v1/images/generatio
2   -H "Content-Type: application/json" \
3   -H "Authorization: Bearer $OPENAI_API_KEY" \
4   -d '{
5     "model": "dall-e-3",
6     "prompt": "A cute baby sea otter",
7     "n": 1,
8     "size": "1024x1024"
9   }'
```



Image (圖案)

OpenAI 目前支援三種圖片產生方式：

- ① **產圖**：提供一段提示詞 (prompt)，AI 會根據給的敘述產生出圖片。
- ② **修圖**：提供一段提示詞 (prompt)，加上想被修改的圖片，AI 會根據給的敘述去加工。
- ③ **優化**：給一張圖片，AI 會自行修改。也就是看 OpenAI 自己要怎麼處理。



Audio (語音)



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Create speech



Create transcription



Create translation



The transcription object



The transcription object



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Audio

Learn how to turn audio into text or text into audio.

Related guide: [Speech to text](#)

Create speech

POST `https://api.openai.com/v1/audio/speech`

Generates audio from the input text.

Request body

model string **Required**

One of the available **TTS models**: `tts-1` or `tts-1-hd`

input string **Required**

The text to generate audio for. The maximum length is 4096 characters.

Example request

curl



```
1 curl https://api.openai.com/v1/audio/speech \  
2   -H "Authorization: Bearer $OPENAI_API_KEY" \  
3   -H "Content-Type: application/json" \  
4   -d '{  
5     "model": "tts-1",  
6     "input": "The quick brown fox jumped over t  
7     "voice": "alloy"  
8   }' \  
9   --output speech.mp3
```



Audio (語音)

OpenAI 目前支援兩種不同的語音功能：

- ① **語音轉文字**：轉換成同語言的文字，如果是多種語言混合的，文字也會是多種語言。
- ② **語音翻譯**：目前只支援翻譯成英文。
- ③ **目前支持的格式有**：mp3、mp4、mpeg、mpga、m4a、wav、webm。



Embeddings (嵌入)



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Create embeddings

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Embeddings

Get a vector representation of a given input that can be easily consumed by machine learning models and algorithms.

Related guide: [Embeddings](#)

Create embeddings

POST `https://api.openai.com/v1/embeddings`

Creates an embedding vector representing the input text.

Request body

input string or array **Required**
Input text to embed, encoded as a string or array of tokens. To embed multiple inputs in a single request, pass an array of strings or array of token arrays. The input must not exceed the max input tokens for the model (8192 tokens for `text-embedding-ada-`

Example request

curl

```
1 curl https://api.openai.com/v1/embeddings \  
2   -H "Authorization: Bearer $OPENAI_API_KEY" \  
3   -H "Content-Type: application/json" \  
4   -d '{  
5     "input": "The food was delicious and the wa  
6     "model": "text-embedding-ada-002",  
7     "encoding_format": "float"  
8   }'
```



Embeddings (嵌入)

- ① 這個功能，就是我們一般所熟知，傳統 machine learning 所提到的 embedding。
- ② 給 OpenAI 任一單字，或一段文字，他會回傳 1536 維的向量。
- ③ 目前使用的 model 是 Ada v2。



Fine-tuning (微調)



Chat



Embeddings



Fine-tuning

Create fine-tuning job

List fine-tuning jobs

List fine-tuning events

List fine-tuning checkpoints

Retrieve fine-tuning job

Cancel fine-tuning

The fine-tuning job object

The fine-tuning job event object

The fine-tuning job checkpoint object



Batch



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Fine-tuning

Manage fine-tuning jobs to tailor a model to your specific training data.

Related guide: [Fine-tune models](#)

Create fine-tuning job

POST https://api.openai.com/v1/fine_tuning/jobs

Creates a fine-tuning job which begins the process of creating a new model from a given dataset.

Response includes details of the enqueued job including job status and the name of the fine-tuned models once complete.

[Learn more about fine-tuning](#)

Request body

Default Epochs Validation file W&B Integration

Example request

curl

```
1 curl https://api.openai.com/v1/fine_tuning/jobs
2   -H "Content-Type: application/json" \
3   -H "Authorization: Bearer $OPENAI_API_KEY" \
4   -d '{
5     "training_file": "file-BK7bzQj3FfZFXr7DbL6x
6     "model": "gpt-3.5-turbo"
7   }'
```

Response



Fine-tuning (微調)

- ① 可以用這個 endpoints 讓 OpenAI ，幫你用你所提供的資料，訓練客製化的 Chat model 。
- ② 例如你想要在任何問題下，都回答一個固定的答案，就可以提供 input/output 作範例，這個 endpoint 就會回傳專為你的資料 fine-tune 過的模型編號。之後就可以用 chat endpoint 直接呼叫你的客製化模型。

跟 OpenAI API 互動

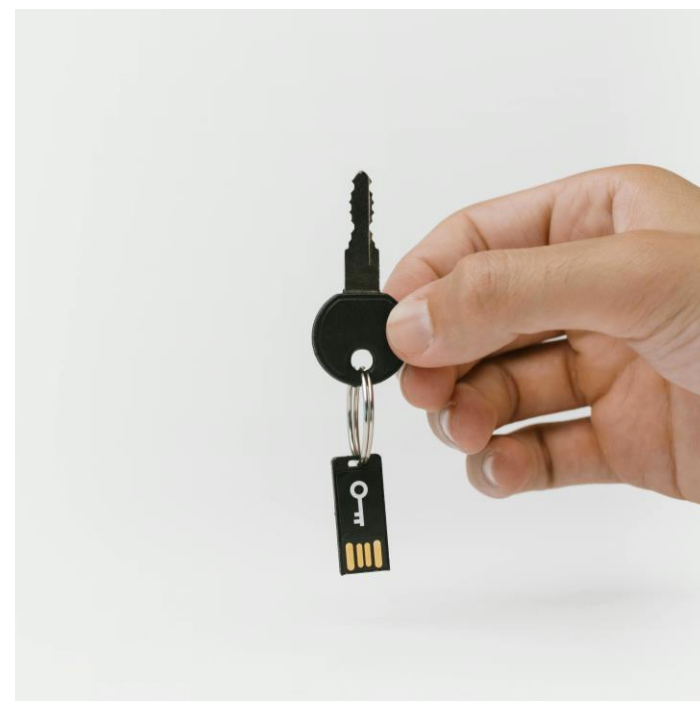
取得 API Key





跟 OpenAI 的 API 互動

- ① 取得 OpenAI 的 API key
- ② 選擇自己要使用的語言
官方支援的有 Python 以及 Node.js
其他語言可以在下列連結找到
<https://platform.openai.com/docs/libraries/community-libraries>
- ③ 打開編輯器寫 Code
跟 OpenAI 互動，一定要提供 API Key。





取得 OpenAI 的 API Key : 找到 OpenAI API 的 Logo



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找到 API keys



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API keys

Your secret API keys are listed below. Please note that we do not display your secret API keys again after you generate them.

Do not share your API key with others, or expose it in the browser or other client-side code. In order to protect the security of your account, OpenAI may also automatically disable any API key that we've found has leaked publicly.

Enable tracking to see usage per API key on the [Usage page](#).

NAME	SECRET KEY	TRACKING ⓘ	CREATED	LAST USED ⓘ	PERMISSIONS	
ccwork_app_team	sk-...jwx0	+ Enable	2023年7月17日	2024年3月18日	All	

+ Create new secret key

Default organization

If you belong to multiple organizations, this setting controls which organization is used by default when making requests with the API keys above.

Personal

Note: You can also specify which organization to use for each API request. See [Authentication](#) to learn more.



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Project API keys

Project API keys have replaced user API keys.

We recommend using project based API keys for more granular control over your resources. [Learn more](#)

[View user API keys](#)

As an owner of this project, you can view and manage all API keys in this project.

Do not share your API key with others, or expose it in the browser or other client-side code. In order to protect the security of your account, OpenAI may also automatically disable any API key that has leaked publicly.

View usage per API key on the [Usage page](#).



Create an API key to access the OpenAI API.

[+ Create new secret key](#)



如何取得「API keys」

Default Project Personal

Project API keys

Project API keys have replaced user API keys. We recommend using project based API keys for more granular control over your resources. [Learn more](#) [View user API keys](#)

As an owner of this project, you can create API keys to use with the OpenAI API. To protect the security of your account, OpenAI may also automatically disable API keys that have not been used for a long time. [View usage per API key](#)

Do not share your API keys. If you do, you may expose your account to unauthorized access.

View usage per API key

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Create new secret key

Name Optional

ccwork_app_team **這裡可以自行輸入名稱**

Project

Default Project

Permissions

All Restricted Read Only

點擊產生 API Keys

Cancel Create secret key



如何取得「API keys」

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Project API keys

API key generated! ✕

i Project API keys have replaced user API keys.
We recommend using project based API keys for more granular control over your resources. [Learn more](#) View user API keys

As an owner of this project, you can view and manage all API keys in this project.

Do not share your API keys. OpenAI automatically discards API keys that are not used for 90 days.

View usage per API key

NAME

ccwork_app_team

+ Create new API key

PERMISSIONS

Read and write API resources

CREATED BY

PERMISSIONS

Creator Training Scho... All

Save your key

Please save this secret key somewhere safe and accessible. For security reasons, you won't be able to view it again through your OpenAI account. If you lose this secret key, you'll need to generate a new one.

`E47paUC0dVnWCDL6aFwxT3B1bkFJ5LnVoVaoDdErcK6` Copy

點擊複製 API Keys

Done

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如何取得「API keys」

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API key copied! × 跳出訊息 · 代表複製成功

Project API keys have replaced user API keys.
We recommend using project based API keys for more granular control over your resources. [Learn more](#) [View user API keys](#)

As an owner of this project, you can view and manage all API keys in this project.

Do not share your API keys. OpenAI will automatically disable API keys that are shared publicly.

View usage per API key

NAME

ccwork_app_team

+ Create new API key

Save your key

Please save this secret key somewhere safe and accessible. For security reasons, you won't be able to view it again through your OpenAI account. If you lose this secret key, you'll need to generate a new one.

sk-proj-E47paUC0dVnWCDL6aFwxT3B1bkFJ5LnVoVa [Copy](#)

Permissions

Read and write API resources

Done

CREATED BY

PERMISSIONS

Creator Training Scho... All [Edit](#) [Delete](#)

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View usage per API key on the [Usage page](#).

NAME	SECRET KEY	CREATED	LAST USED ⓘ	CREATED BY	PERMISSIONS	
ccwork_app_team	sk-...gNvV	2024年5月6日	Never	Creator Training Scho...	All	

+ Create new secret key



範例一：在 Python 程式中找到 API Key 的對應位置

```
curl https://api.openai.com/v1/models \  
-H "Authorization: Bearer $OPENAI_API_KEY"
```

- ① 用來向 OpenAI 的 API 送出一個 HTTP 要求，目的是取得可用的模型列表。
- ② `https://api.openai.com/v1/models` 是目標 API 的端點 (endpoints) 。
- ③ `/v1/models` 是一個路徑，指向 OpenAI API 的模型列表資源。
- ④ `-H "Authorization: Bearer $OPENAI_API_KEY"` 是一個 HTTP header，用來傳遞身份驗證資訊。
- ⑤ `Authorization` 是 header 的類型，`Bearer` 是一種身份驗證方案，後面跟著一個 token。
- ⑥ **`$OPENAI_API_KEY` 是一個環境變數，用來儲存訪問 OpenAI API 所需的金鑰。**
- ⑦ 這段程式碼的作用，是透過向 OpenAI API 送出 HTTP 要求，使用指定的 token 來取得可用的模型列表。



範例二：在 Python 程式中找到 API Key 的對應位置

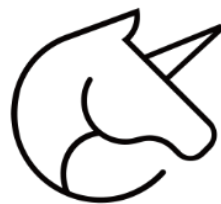
```
import openai
openai.api_key = os.getenv("OPENAI_API_KEY")
```

- ① 這段程式碼是用來設定 OpenAI 的 API 金鑰。
- ② `import openai`：這行代碼導入 `openai` 的模組。
- ③ `openai.api_key = os.getenv("OPENAI_API_KEY")`：這行設置了 OpenAI API 的金鑰。
- ④ `os.getenv()` 函數用於獲取環境變數的值，而 `"OPENAI_API_KEY"` 則是要獲取的環境變數的名稱。
- ⑤ **在程式執行時，需要先設置環境變數 `OPENAI_API_KEY`，並將其設置為你的 OpenAI API 金鑰。**
- ⑥ 這段程式碼的作用，是將程式與 OpenAI API 連接起來，以便後續使用 API 的功能。

跟 OpenAI API 互動

課後練習





課後學習

在 OpenAI API 裡面，本課程已簡述了其中 5 個主要的 API endpoints，請查詢一下其他 4 個 endpoints，簡單說明查到的資訊。

課程已說明：

- Chat (對話)
- Image (圖案)
- Audio (語音)
- Embeddings (嵌入)
- Fine-tuning (微調)

課後學習：

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- Models
- Moderations

The screenshot shows the OpenAI API documentation website. The top navigation bar includes 'Documentation' and 'API reference'. A search bar is present with a 'CTRL K' shortcut. The left sidebar contains navigation icons and a list of sections: 'GETTING STARTED' (Introduction, Authentication, Making requests, Streaming) and 'ENDPOINTS' (Audio, Chat, Embeddings, Fine-tuning, Batch, Files, Images, Models, Moderations). The main content area is titled 'Introduction' and contains text about interacting with the API and installing the official Python and Node.js libraries. Code blocks show the installation commands: `pip install openai` and `npm install openai@^4`. The 'Authentication' section is partially visible at the bottom.