Connect to Azure OpenAI in Python

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Contents

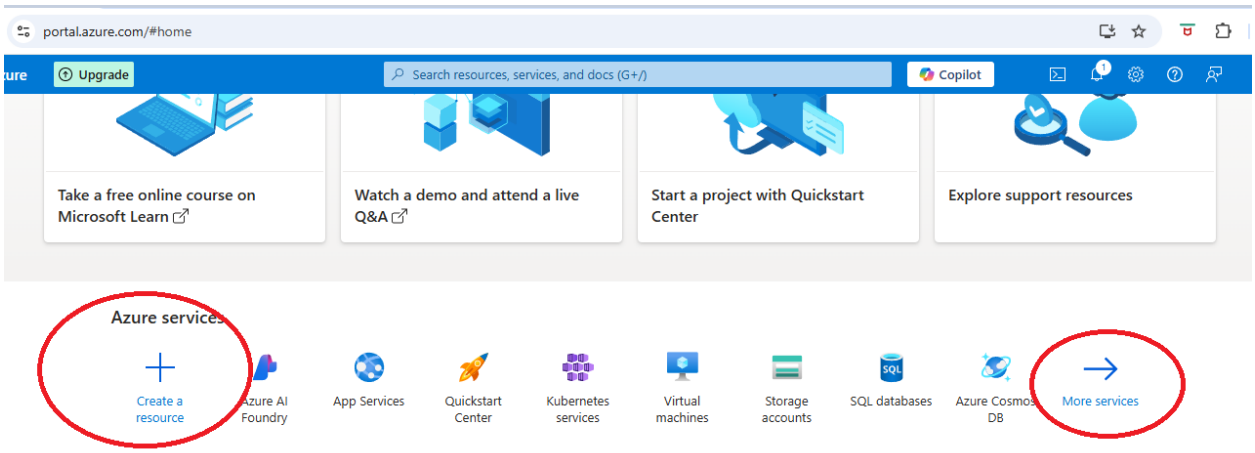
Preface

This document shows how to use Python to connect to Azure OpenAI. Generally speaking, you will need to create a resource in Azure, get the end point and api keys, and then use the end point and api leys to connect to Azure Open Ai. It's simple like that.

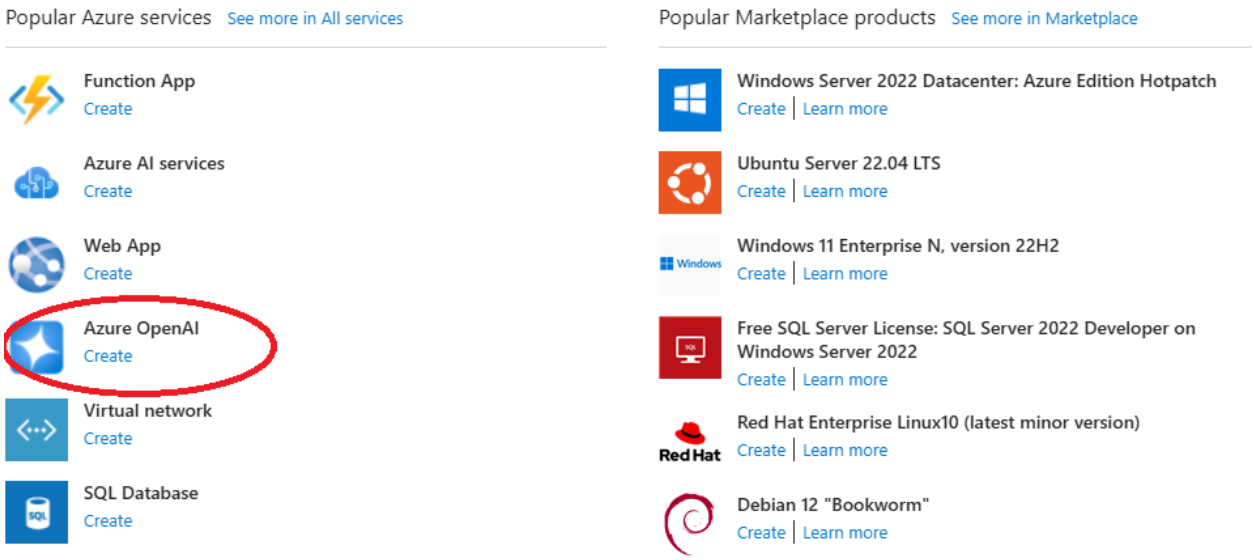
There are some differences to use Azure OpenAI and use OpenAI directly. We will only focus on Azure OpenAI at this moment.

Create a Resource on Azure Portal

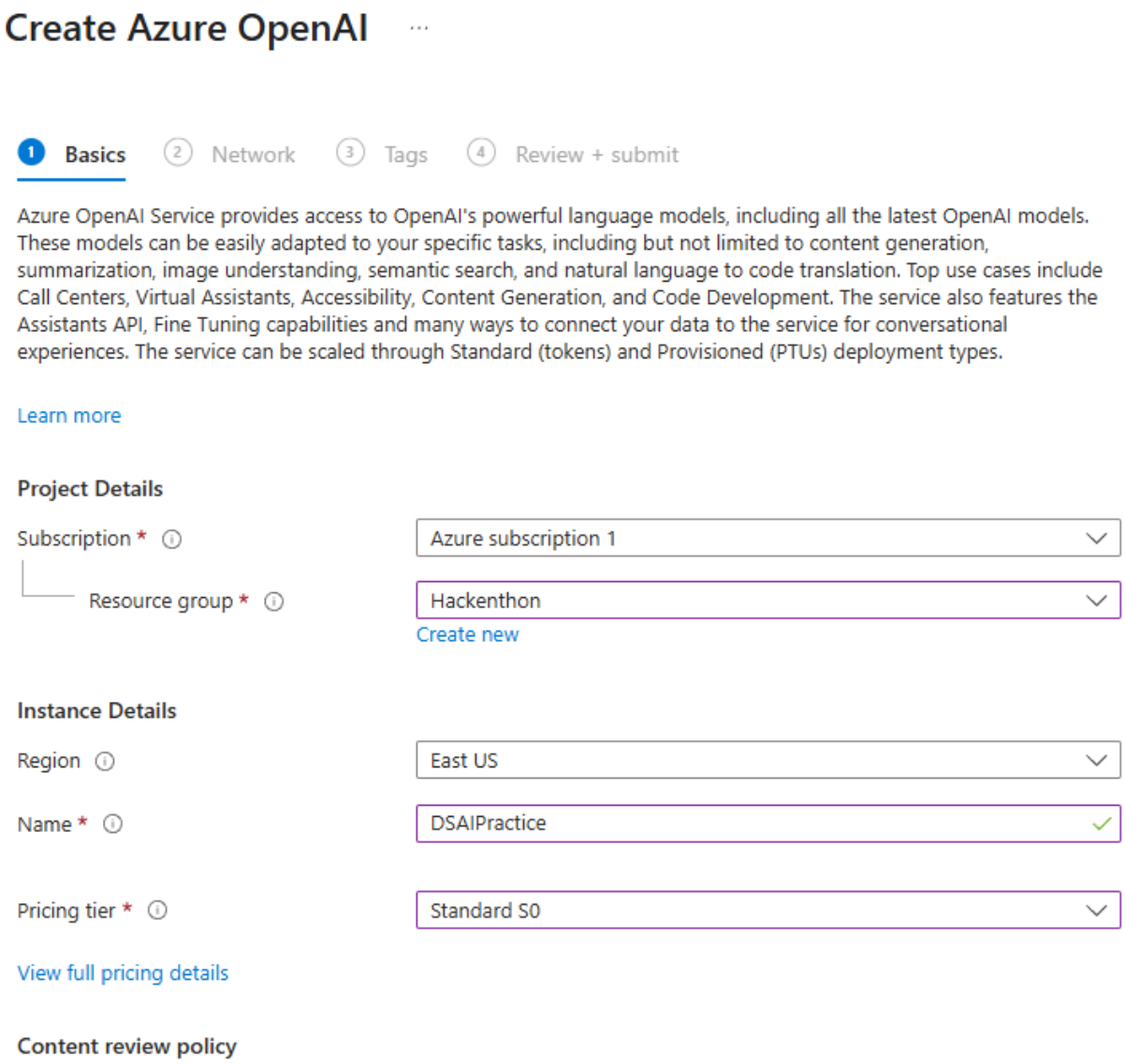
1. Login to Azure portal https://portal.azure.com/#home (Create a Azure account if you don't have one).
2. Click on Create a resource or More Services:



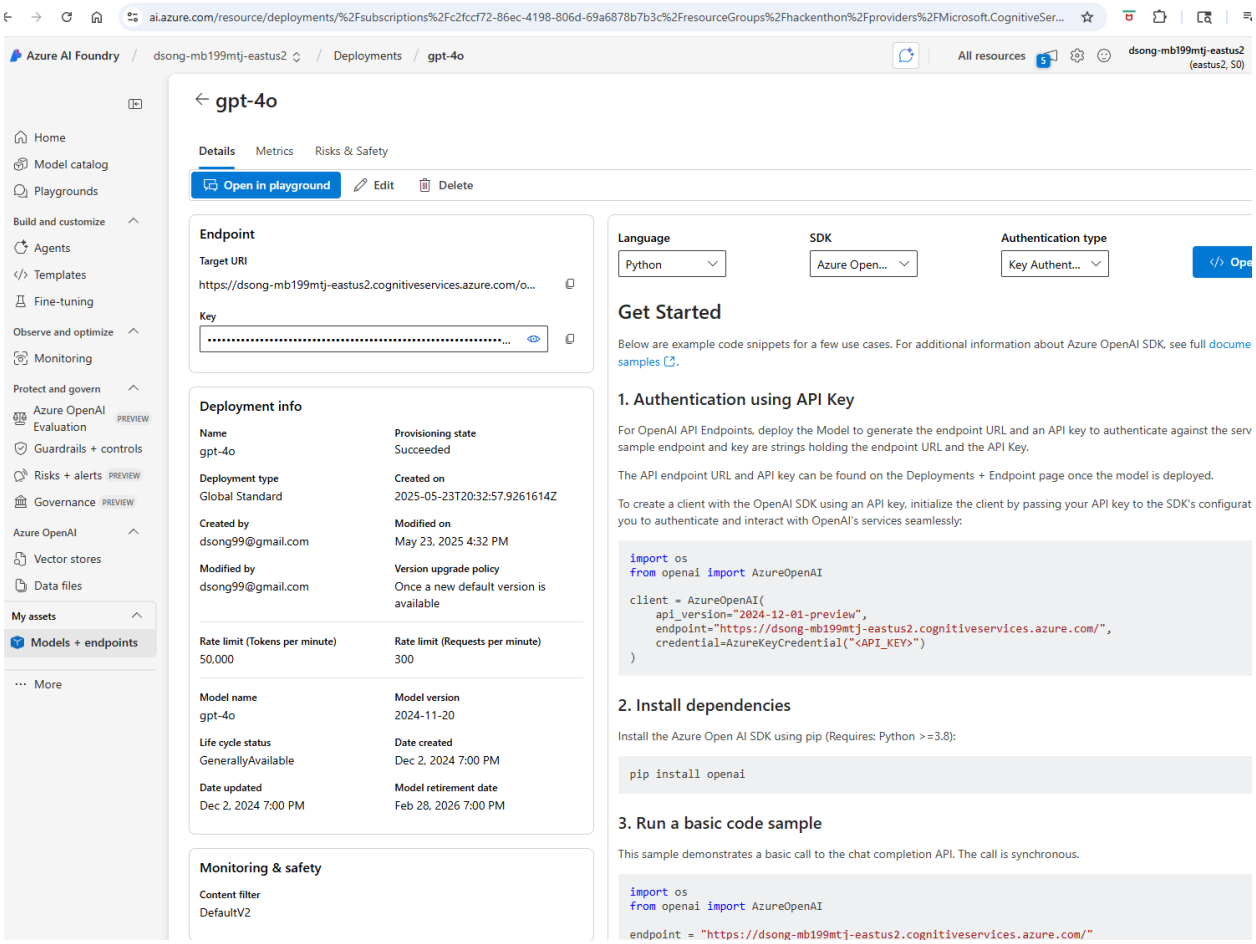
3. Click on Azure OpenAI



4. Fill in information, then click next, next, …, at the end click create button.



5. One the resource is created, it will be deployed. The deployment process will take a minute or two. Once it's done, click on resources, this will bring to the resource page. Click on the resource you just created.
   You can also get to the page by clicking **Model + endpoints** at the left end corner of the resource page.



6. On top of the page, you can see Endpoint and key, these two are needed in your python script, just copy those two values. On the right side of the page, it shows examples how to connect to Azure OpenAI.

Use Python to create a chat bot

Install Python packages

This example use a few Python packages, you will need to install them either use conda or pip: dotenv, langchain, langchain_openai

Create a file named: ".env"

Copy and paste the endpoint and key from resource page above to this file:

```
AZURE_OPENAI_API_KEY='AxYnHXDtx***'
AZURE_OPENAI_ENDPOINT='https://dsong-***version=2025-01-01-preview'
```

Source code

```
from langchain_openai import AzureChatOpenAI
from dotenv import load_dotenv
from langchain.prompts import ChatPromptTemplate


load_dotenv()

llm = AzureChatOpenAI(
    azure_deployment="gpt-4o",  # or your deployment
    api_version="2025-01-01-preview",  # or your api version
)

user_input=input('You:')

prompt = ChatPromptTemplate(
    {
        ('system', ('You are a helpful AI assistant. Please assist the
user')),
        ('human', user_input)
    }
)

response = llm.invoke(prompt.format(user_input=user_input))
print(response.content)
```

1. Note: load_dotenv() loads the .env file and set properties in that file to the environment.

Connect to Azure OpenAI

This example will show how to connect to AzureOpenAI without using langchain.

Required package: install openai

Source Code

```
import os
from openai import AzureOpenAI

endpoint = 'https://dsong-mb199mtj-*** 2025-01-01-preview'
model_name = "gpt-4o"
deployment = "gpt-4o"

subscription_key = 'AxYnHXDtxFCi1uuKKk3r7rk***'
api_version = "2025-01-01-preview"

client = AzureOpenAI(
    api_version=api_version,
```

```
        azure_endpoint=endpoint,
        api_key=subscription_key,
    )

    response = client.chat.completions.create(
        messages=[
            {
                "role": "system",
                "content": "You are a helpful assistant.",
            },
            {
                "role": "user",
                "content": "I am going to Paris, what should I see?",
            }
        ],
        max_tokens=10,
        temperature=0,
        top_p=1.0,
        model=deployment
    )

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

Generate two dataframe differences report from OpenAI

Scouce code

```
import os
from openai import AzureOpenAI

endpoint = 'https://dsong-***-
eastus2.cognitiveservices.azure.com/openai/deployments/gpt-
4o/chat/completions?api-version=2025-01-01-preview'
model_name = "gpt-4o"
deployment = "gpt-4o"

subscription_key = 'AxYnHXD***'
api_version = "2025-01-01-preview"

client = AzureOpenAI(
    api_version=api_version,
    azure_endpoint=endpoint,
    api_key=subscription_key,
)
import pandas as pd

df1 = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
df2 = pd.DataFrame({'A': [1, 2, 5], 'B': [4, 7, 6]})

comparison = df1.compare(df2)
prompt = f"""
```

```
Compare the following two dataframes and generate a report highlighting the
differences:

DataFrame 1:
{df1.to_string()}

DataFrame 2:
{df2.to_string()}

Generate a concise report summarizing the changes, including added, removed,
and modified rows or values.
"""


response = client.chat.completions.create(
    messages=[
        {
            "role": "system",
            "content": "You are a helpful assistant.",
        },
        {
            "role": "user",
            "content": prompt,
        }
    ],
    max_tokens=200,
    temperature=0,
    top_p=1.0,
    model=deployment
)


# Extract the generated report
print(response.choices[0].message.content)
```

result

Report: Comparison of DataFrame 1 and DataFrame 2

Summary of Differences:

1. **Modified Values**:

  - In row index `1`, column `B`:

    - **DataFrame 1**: Value is `5`

    - **DataFrame 2**: Value is `7`

2. **Modified Rows**:

- Row index `2`:

  - **DataFrame 1**: `[A=3, B=6]`

  - **DataFrame 2**: `[A=5, B=6]`

3. **No Added or Removed Rows**:

   - Both DataFrames have the same number of rows (3). No rows were added or removed.

Detailed Changes:

| Index | Column | DataFrame 1 Value | DataFrame 2 Value | Change Type |

|-------|--------|-------------------|-------------------|---------------|

| 1 | B | 5

References:

1. OpenAI document https://platform.openai.com/docs/overview
2. Python connect to OpenAI: https://www.youtube.com/watch?v=czvVibB2lRA
3. Tutorial video on Azure OpenAI and GPT Models https://www.youtube.com/watch?v=jQyYeYWD97I
4. Tutorial video Getting Started with Azure OpenAI | GPT 4o https://www.youtube.com/watch?v=H_1Ge6wxaaE
5. How to setup Azure OpenAI service and use it in Python https://www.youtube.com/watch?v=50ZwmkCvE88
6. Free AI: https://huggingface.co/
7. Python langchain package: https://python.langchain.com/docs/integrations/chat/azure_chat_openai/