

4. AI 앱개발 어시스턴트



GitHub Copilot



GitHub Copilot

<https://docs.github.com/ko/copilot>

The screenshot shows the GitHub Docs website for GitHub Copilot in Korean. The browser tab is 'GitHub Copilot 문서 - GitHub' and the address bar shows 'docs.github.com/ko/copilot'. The page header includes the GitHub Docs logo, a version selector set to 'Free, Pro, & Team', and a search bar. A left sidebar lists navigation links: 'About GitHub Copilot', '빠른 시작', 'GitHub Copilot 사용' (with a dropdown arrow), 'Copilot Individual' (with a dropdown arrow), 'Copilot Business' (with a dropdown arrow), 'Copilot Enterprise' (with a dropdown arrow), 'Manage Copilot in your organization' (with a dropdown arrow), 'Copilot 채팅' (with a dropdown arrow), 'CLI의 Copilot' (with a dropdown arrow), 'GitHub Copilot 구성' (with a dropdown arrow), and '문제 해결' (with a dropdown arrow). The main content area has the title 'GitHub Copilot 문서' and a subtitle 'GitHub Copilot을 사용하여 코딩할 때 AI 쌍 프로그래머의 자동 완성 스타일 제안을 받을 수 있습니다.' Below this are two buttons: '개요' (Overview) and '빠른 시작' (Get started). The page is divided into three columns. The first column, '시작 위치' (Where to start), contains a link 'GitHub Copilot 시작' with the text '기본 설정 환경에 확장을 설치하여 GitHub Copilot 사용을 시작할 수 있습니다.' The second column, '인기 사이트' (Popular sites), contains a link 'GitHub Copilot 청구 정보' with the text 'GitHub Copilot을(를) 사용하려면 개인 계정의 GitHub Copilot에 대한 구독을 보유하고 있거나, GitHub Copilot Business에 대한 구독을 보유한 GitHub Enterprise Cloud의 조직에서 시트를 할당받아야 합니다.' and a link '사용자 환경에서 GitHub Copilot 구성하기' with the text '지원되는 IDE에서 GitHub Copilot을(를) 활성화 또는 비활성화하거나 구성할 수 있습니다.' The third column, '새로운 기능' (New features), contains a link 'Copilot - February 27th update' (February 28), a link 'GitHub Copilot Enterprise is now generally available' (February 28), and a link 'Copilot in GitHub Support (GA)' (February 10). A '모두 보기' (View all) link is also present.

GitHub Docs | Version: Free, Pro, & Team

GitHub Copilot 문서

GitHub Copilot을 사용하여 코딩할 때 AI 쌍 프로그래머의 자동 완성 스타일 제안을 받을 수 있습니다.

[개요](#) [빠른 시작](#)

시작 위치

[GitHub Copilot 시작](#)
기본 설정 환경에 확장을 설치하여 GitHub Copilot 사용을 시작할 수 있습니다.

인기 사이트

[GitHub Copilot 청구 정보](#)
GitHub Copilot을(를) 사용하려면 개인 계정의 GitHub Copilot에 대한 구독을 보유하고 있거나, GitHub Copilot Business에 대한 구독을 보유한 GitHub Enterprise Cloud의 조직에서 시트를 할당받아야 합니다.

[사용자 환경에서 GitHub Copilot 구성하기](#)
지원되는 IDE에서 GitHub Copilot을(를) 활성화 또는 비활성화하거나 구성할 수 있습니다.

[GitHub.com에서 GitHub Copilot 설정 구성](#)

새로운 기능 [모두 보기](#)

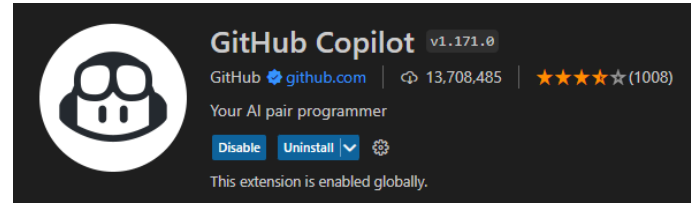
[Copilot - February 27th update](#)
February 28

[GitHub Copilot Enterprise is now generally available](#)
February 28

[Copilot in GitHub Support \(GA\)](#)
February 10

GitHub Copilot

VS Code Extension GitHub Copilot 설치

A screenshot of the VS Code interface. The left sidebar shows the "EXTENSIONS: MARKETPLACE" view with a search for "GitHub Copilot". The main area displays the "Extension: GitHub Copilot" details page. The page includes the GitHub logo, version "v1.171.0", "GitHub github.com", "13,708,485" downloads, and a "5-star (1008)" rating. Below this, it says "Your AI pair programmer" and has an "Install" button. The "DETAILS" tab is selected, showing a "Followers" section with "36k" followers, a "Try Copilot" button, and a "Free trial" badge. The "Get Code Suggestions in real-time, right in your IDE" section is visible. The right sidebar shows "Categories" (Programming Languages, Snippets, Machine Learning, Education) and "Extension Resources" (Marketplace, Issues, GitHub). The bottom status bar shows "AWS: AWS Builder ID" and "CodeWhisperer".

File Edit Selection View Go Run Terminal Help

EXTENSIONS: MARKETPLACE

GitHub Copilot

GitHub Copilot v1.171.0
GitHub github.com | 13,708,485 | ★★★★★ (1008)
Your AI pair programmer
Disable Uninstall ⚙️
This extension is enabled globally.

Extension: GitHub Copilot

GitHub Copilot v1.171.0
GitHub github.com | 13,708,485 | ★★★★★ (1008)
Your AI pair programmer
Install ⚙️

DETAILS FEATURE CONTRIBUTIONS CHANGELOG EXTENSION PACK

Followers 36k Follow @github Views 16M Try Copilot Free trial

Your AI pair programmer

Get Code Suggestions in real-time, right in your IDE

```
1 def common_prefix(a, b):
2     """Return the common prefix of two lists."""
3     if len(a) < len(b):
4         return common_prefix(b, a)
5     for i in range(len(a)):
6         if a[i] != b[i]:
7             return a[:i]
8     return a
9
10 def test_common_prefix():
11     assert common_prefix(['a','b','c'], ['a','b','c','d']) == ['a','b','c']
12     assert common_prefix(['a','b','c'], ['b','c','d']) == ['b','c']
13     assert common_prefix(['a','b','c'], ['b','c']) == ['b','c']
14     assert common_prefix(['a','b','c'], ['a','b']) == ['a','b']
15     assert common_prefix([], []) == []
```

Categories

Programming Languages
Snippets Machine Learning
Education

Extension Resources

Marketplace
Issues
GitHub

More Info

Published 2021-06-29, 23:26:17
Last released 2024-03-02, 07:35:14
Identifier github.copilot

⌵ 0 0 0 0 AWS: AWS Builder ID CodeWhisperer

GitHub Copilot – 가입

GitHub Copilot free trial

\$0.00

30-day free trial. Converts to paid subscription after the trial period ends.

Paid plan after trial

\$10/month

You can cancel GitHub Copilot at any time before the trial ends to avoid getting billed.

[← Select a different plan](#)

Confirm your payment details


Due today

\$0.00

🕒

You will be billed \$10/month starting March 31, 2024.

Billing Information

 **Danny Park**
Personal account

First name *

Danny

Last name *

park

Address (P.O. box, company name, c/o) *

1, Sunae-ro 1beon-gil, Bundang-gu

Address line 2 (Apartment, suite, unit)

City *

Seongnam-si,

Country/Region *

Korea, South

State/Province

Gyeonggi-do

Postal/Zip code

13601

Required for certain countries

Required for certain countries

Save

Payment method

Pay with

Credit or debit card

PayPal account

Card Number

Expiration Date (YYYY)


- Select One -

/

- Select One -

CVV

Save payment information



GitHub Copilot - 가입

Signup to GitHub Copilot

github.com/github-copilot/signup/billing?payment_duration=monthly

GitHub Copilot free trial

\$0.00

30-day free trial. Converts to paid subscription after the trial period ends.

Paid plan after trial

\$10/month

You can cancel GitHub Copilot at any time before the trial ends to avoid getting billed.

[← Select a different plan](#)

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⌚

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First name *

Last name *

Address (P.O. box, company name, c/o) *

Address line 2 (Apartment, suite, unit)

City *

Country/Region *

Choose your country

State/Province

Postal/Zip code

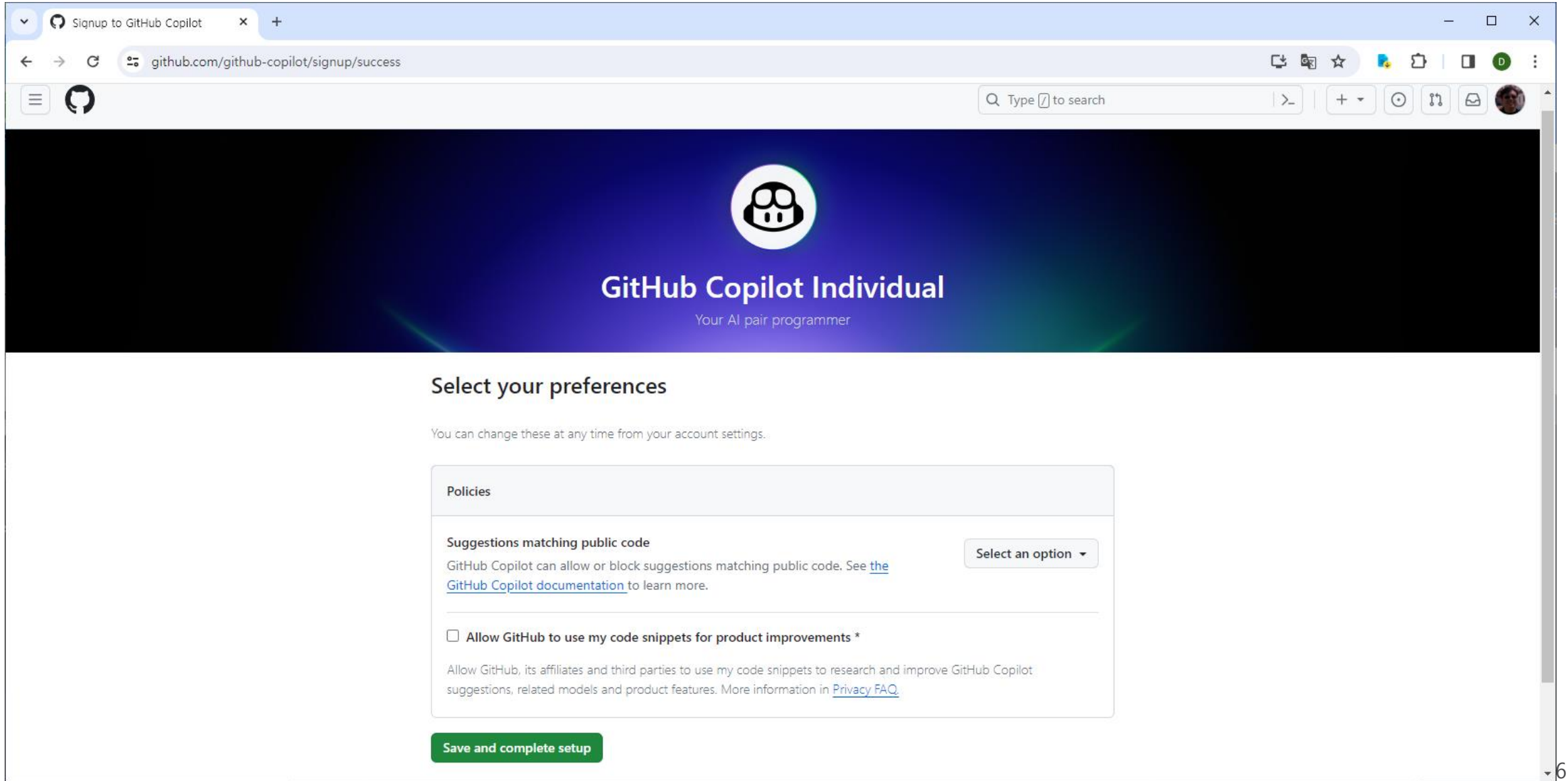
Required for certain countries

Required for certain countries

Save

5

GitHub Copilot - 가입



The screenshot shows a web browser window with the address bar displaying "github.com/github-copilot/signup/success". The page features a dark blue header with the GitHub Copilot logo (a white octocat head) and the text "GitHub Copilot Individual" and "Your AI pair programmer". Below the header, the section "Select your preferences" is displayed, with a note: "You can change these at any time from your account settings..". The preferences section is titled "Policies" and contains two main options:

- Suggestions matching public code**: A section with a dropdown menu labeled "Select an option". Below it, text states: "GitHub Copilot can allow or block suggestions matching public code. See [the GitHub Copilot documentation](#) to learn more."
- Allow GitHub to use my code snippets for product improvements ***: A checkbox that is currently unchecked. Below it, text states: "Allow GitHub, its affiliates and third parties to use my code snippets to research and improve GitHub Copilot suggestions, related models and product features. More information in [Privacy FAQ](#)."

At the bottom of the form is a green button labeled "Save and complete setup".


GitHub Copilot 기능

GitHub Copilot 가입 후 VS Code 재실행

■ Copilot 코드 제안 사용

```
def hello():  
def add(a, b):  
employees =  
def save_json(url, filename):  
  
from dataclasses import dataclass  
from datetime import date  
  
@dataclass  
class Person:  
  
query_users_by_first_or_last_name =
```

■ GitHub Copilot 단축키

	제안 수락
	인라인 제안 닫기
 	새 탭에서 모든 제안 표시
 	다음 제안 보기
 	이전 제안 보기
 	인라인 제안 트리거

macOS : Alt키 대신 Option 키 사용

GitHub Copilot 기능

■ 주석문을 사용하여 문제 설명

Print "Hello, World!"

Tab ⇌

Function to zip and unzip a file

Tab ⇌

Building a tictactoe game

Tab ⇌

Expose a REST API endpoint using the Flask framework to serve
a JSON-serialized list products queried from SQLite database.

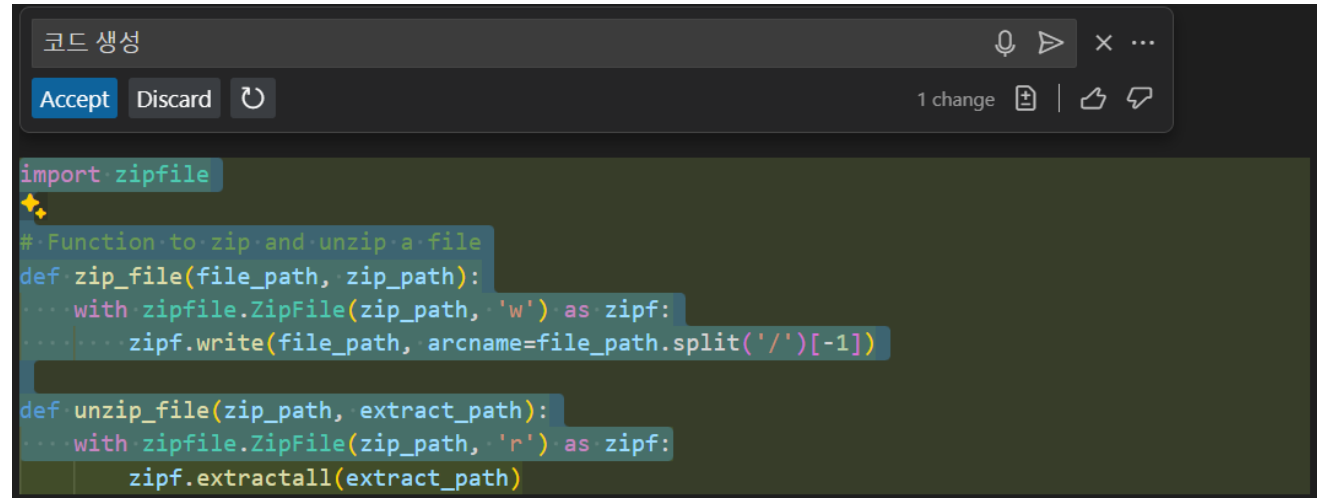
Tab ⇌

Create FizzBuzz function that receives a parameter with a number
If the number is divisible by 3, return "Fizz"
If the number is divisible by 5, return "Buzz"
If the number is divisible by 3 and 5, return "FizzBuzz"
Else, print the number

Tab ⇌

Create a PostgreSQL Server table with players.

Tab ⇌

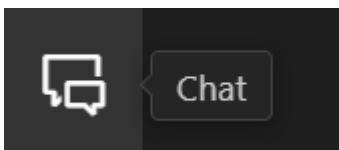


```
코드 생성
Accept Discard ↺
1 change

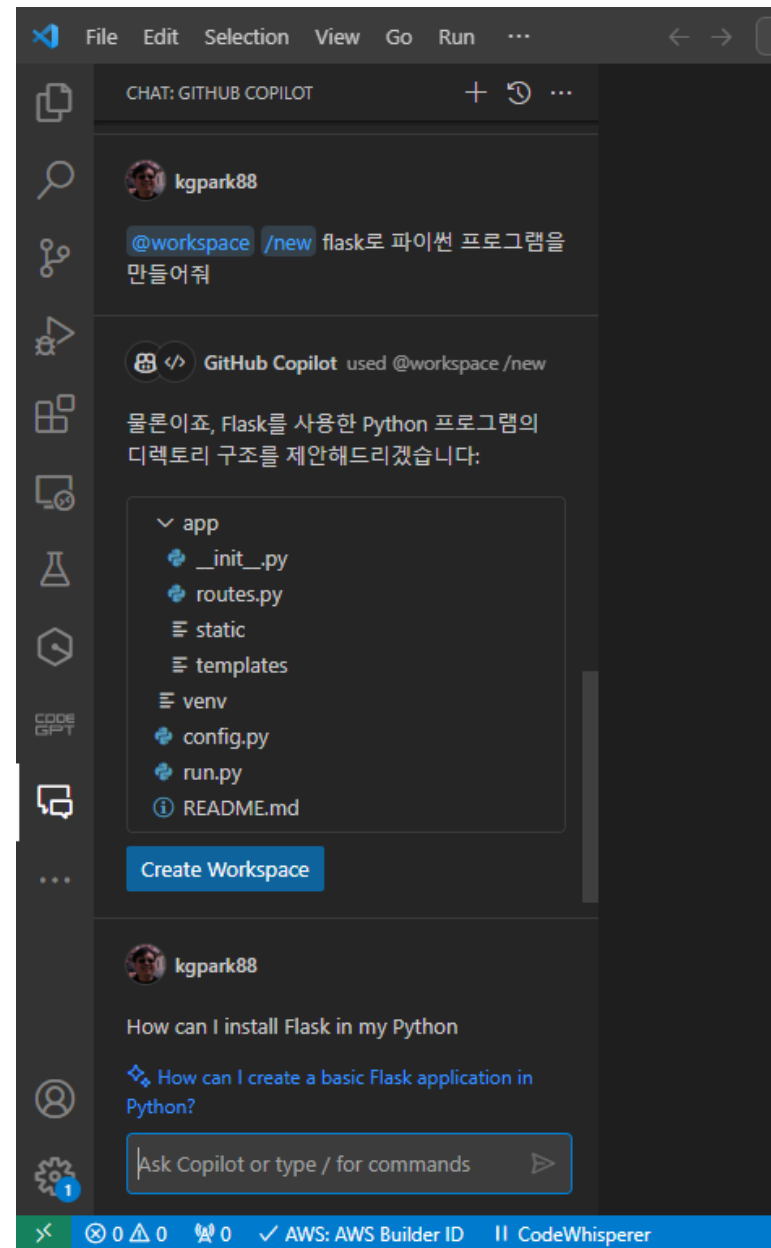
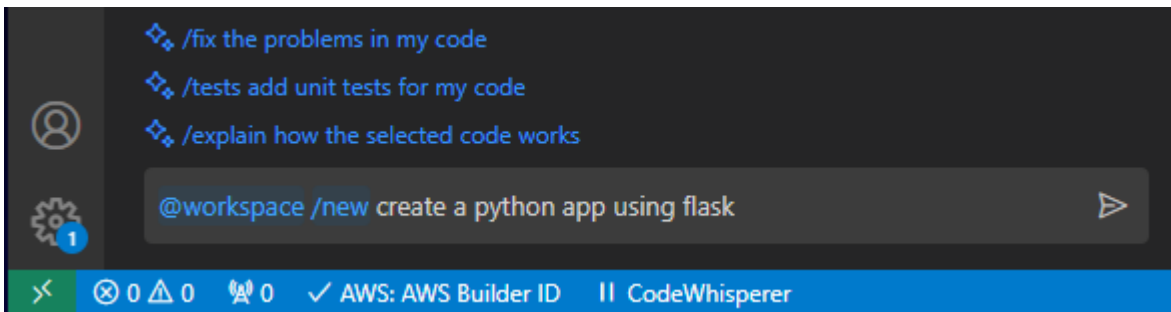
import zipfile
# Function to zip and unzip a file
def zip_file(file_path, zip_path):
    with zipfile.ZipFile(zip_path, 'w') as zipf:
        zipf.write(file_path, arcname=file_path.split('/')[-1])

def unzip_file(zip_path, extract_path):
    with zipfile.ZipFile(zip_path, 'r') as zipf:
        zipf.extractall(extract_path)
```

GitHub Copilot 기능



@workspace /new flask로 파이썬 프로그램을 만들어줘



GitHub Copilot 기능

/fix No module named 'matplotlib'

The screenshot displays the VS Code interface with the GitHub Copilot extension. On the left sidebar, the 'CHAT: GITHUB COPILOT' panel shows documentation for the `index()` function. The main editor area is titled 'Import Required Libraries' and contains a code cell with the following Python code:

```
# Importing the necessary libraries
import pandas as pd
import matplotlib.pyplot as plt

# Setting the style for matplotlib

plt.style.use('fivethirtyeight')
```

Below the code cell, a traceback for `ModuleNotFoundError: No module named 'matplotlib'` is visible. A chat window is open, showing the command `/fix ModuleNotFoundError: No module named 'matplotlib'` and the response: "To fix the 'ModuleNotFoundError: No module named 'matplotlib'' error, you can install the matplotlib module using the command `%pip install matplotlib`."

The chat window also includes a suggestion: "How can I customize the style of the matplotlib plot in my Jupyter Notebook?" and a "View in Chat" button.

The bottom status bar shows the current file is `Cell 2 of 10` and the Python environment is `py311 (Python 3.11.8)`.

GitHub Copilot 기능

@workspace /newNotebook import stock.csv and plot Close over time

The screenshot displays the GitHub Copilot interface within a VS Code environment. On the left, a chat window shows a conversation with a user named kgpark88. The user's message is "@workspace /newNotebook import KT.csv and plot Close over time". The Copilot response includes a brief description of the docstring for the `index()` function and an overall summary of the code. Below this, a list of references is shown, including a link to "Import Required Libraries". A "Create Notebook" button is visible at the bottom of the chat window.

The main editor area on the right shows a Jupyter notebook titled "Untitled-1.ipynb". The notebook has two cells. The first cell is titled "Import Required Libraries" and contains the following Python code:

```
# Importing the necessary libraries
import pandas as pd
import matplotlib.pyplot as plt

# Setting the style for matplotlib
plt.style.use('fivethirtyeight')
```

The second cell is titled "Load the CSV File" and contains the following Python code:

```
# Loading the CSV file
kt_df = pd.read_csv('KT.csv')

# Display the first few rows of the DataFrame
kt_df.head()
```

The status bar at the bottom indicates "Cell 10 of 10" and "CodeWhisperer".

GitHub Copilot 기능

@workspace /explain Write an explanation for the active selection as paragraphs of text.

The screenshot shows the VS Code interface with a Python file named `coding_with_ai.ipynb` open. The active cell contains the following code:

```
# Converting the 'Date' column to a DateTime object
kt_df['Date'] = pd.to_datetime(kt_df['Date'])

# Checking the data types of each column after
kt_df.dtypes
```

GitHub Copilot has generated an explanation for this code snippet, displayed in the left sidebar. The explanation is as follows:

Used 1 reference >

The provided code snippet is performing two operations on a pandas DataFrame named `kt_df`.

The first line of code is converting the 'Date' column of the DataFrame to a DateTime object. This is done using the `pd.to_datetime()` function, which is a very useful function in pandas when working with time series data. It converts a series of date-like objects into a series of DateTime objects. This conversion is necessary because the data in the 'Date' column might be stored as strings or other data types that are not suitable for time series analysis. By converting the 'Date' column to DateTime objects, we can take advantage of pandas' powerful time series functionality.

The second line of code is checking the data types of each column in the DataFrame after the conversion. This is done using the `dtypes` attribute of the DataFrame, which returns a Series with the data type of each column. The purpose of this line is to confirm that the 'Date' column has been successfully converted to DateTime objects.

Below the explanation, there is a search bar with the text "Ask Copilot or type / for commands".

In the background, a context menu is open over the code, showing various actions like "Go to Definition", "Find All References", "Show Call Hierarchy", "Copilot", "Rename Symbol", "Change All Occurrences", "Refactor...", "Source Action...", "Notebook Cell", "Cut", "Copy", "Paste", "Run Python", and "Command Palette...".

GitHub Copilot 기능

my-flask-app [Administrator]

CHAT: GITHUB COPILOT

kgpark88

@workspace /newNotebook import KT.csv and plot Close over time

GitHub Copilot used @workspace /newNotebook

Used 1 reference >

Here's an outline for a Jupyter notebook that imports 'KT.csv' and plots 'Close' over time:

- Import Required Libraries
- Load the CSV File
- Inspect the Data
- Convert Date to DateTime
- Plot 'Close' Over Time

Create Notebook

kgpark88

/fix ModuleNotFoundError: No module named 'matplotlib'

GitHub Copilot

To fix the "ModuleNotFoundError: No module named 'matplotlib'" error, you can install the matplotlib module using the command `%pip install matplotlib`.

```
%pip install matplotlib
```

Ask Copilot or type / for commands

coding_with_ai.ipynb

D: > 강의자료 > 생성형AI로AI애플리케이션개발하기 > code > coding_with_ai.ipynb > M+Plot 'Close' Over Time > # Plotting 'Close' over time

+ Code + Markdown | ▶ Run All ↺ Restart ≡ Clear All Outputs | 📄 Variables ≡ Outline ...

py311 (Python 3.11.8)

```
plt.xlabel('Date') # Setting the x-label of the plot
plt.ylabel('Close') # Setting the y-label of the plot
plt.legend() # Displaying the legend
plt.show() # Displaying the plot
```

[5] ✓ 0.5s

Python

Close Over Time

Close

Date

Cell 11 of 11

GitHub Copilot Adventure



<https://github.com/microsoft/CopilotAdventures>

GitHub Copilot Adventure : 워밍업



배경

에코성 에코룸은 들어오는 모든 사람에게 숫자를 말하는 신비한 힘을 가지고 있습니다.

이 방에서는 숫자가 차례로 울려 퍼지고, 다음 메아리를 예측할 수 있는 사람만이 성의 숨겨진 보물을 얻을 자격이 있습니다.

목표

에코룸에 들어가서 숫자 순서를 듣고 다음에 울려 퍼질 숫자를 예측하는 것입니다.

과거에 에코룸에서 울려 퍼진 일련의 숫자가 제공됩니다.

이 숫자를 사용하여 순서의 다음 숫자를 알아내세요.

[Specification]

Input: 과거에 에코룸에서 울려 퍼진 최소 세 개의 숫자 목록, 연속된 숫자 사이의 차이는 일정합니다.

예 : [3, 6, 9, 12]

Output : 시퀀스의 다음 숫자를 나타내는 단일 숫자입니다.

예 : 15

- 문제 : <https://github.com/microsoft/CopilotAdventures/blob/main/Adventures/StartHere.md>
- 솔루션 : <https://github.com/microsoft/CopilotAdventures/blob/main/Solutions/Python/The-Chamber-Of-Echos.py>

GitHub Copilot Adventure : 시계 마을 템포라



배경

템포라 마을 중심에는 그랜드 시계탑의 시간이 기준시간입니다. 시간이 지나면 마을의 작은 시계들이 기준시간에서 벗어납니다.

목표

마을에 있는 각 시계가 그랜드 시계탑의 시간보다 몇 분이나 앞서는지 뒤처져 있는지 계산하세요.

[Specification]

Input: 24시간 형식의 시계 시간

o 그랜드 시계탑 시간 15:00

o 마을 주변의 시계 시간:

- 시계 1: 14:45
- 시계 2: 15:05
- 시계 3: 15:00
- 시계 4: 14:40

Output : 시간 차이를 분 단위로 나타내는 정수 리스트. 양수 값은 시계가 앞서 있음을 나타내고 음수 값은 시계가 뒤처짐을 나타냄

■ 문제 : <https://github.com/microsoft/CopilotAdventures/blob/main/Adventures/1-Beginner/The-Clockwork-Town-of-Tempora.md>

■ 솔루션 : <https://github.com/microsoft/CopilotAdventures/blob/main/Solutions/Python/The-Clockwork-Town-of-Tempora.py>¹⁶

GitHub Copilot Adventure : 알고라의 마법의 숲



배경

알고라의 숲에 사는 두 크리처 록스와 파엘리스가 숲에 균형을 가져오는 의식으로, 천 년마다 신성한 춤을 추고 있습니다.

목표 : 두 동물의 춤이 끝난 후 숲의 상태를 파악하는 것입니다.

[Specification]

1 Dance 동작(Moves) : Twirl, Leap, Spin 동작 중 하나를 수행합니다.
2. Dance 효과(Effects) 두 크리처의 춤 동작 조합으로 마법효과가 발생하고 숲의 상태가 변합니다.

- o Twirl + Twirl = Fireflies light up the forest.

- o Leap + Spin = Gentle rain starts falling.

- o Spin + Leap = A rainbow appears in the sky.

다른 조합으로 다양한 효과를 만들 수 있습니다.

3. Dance Sequence: 춤은 5개의 시퀀스로 구성되고, 각 춤 동작 후의 숲의 상태를 표시해야 합니다.

4. Creature Moves

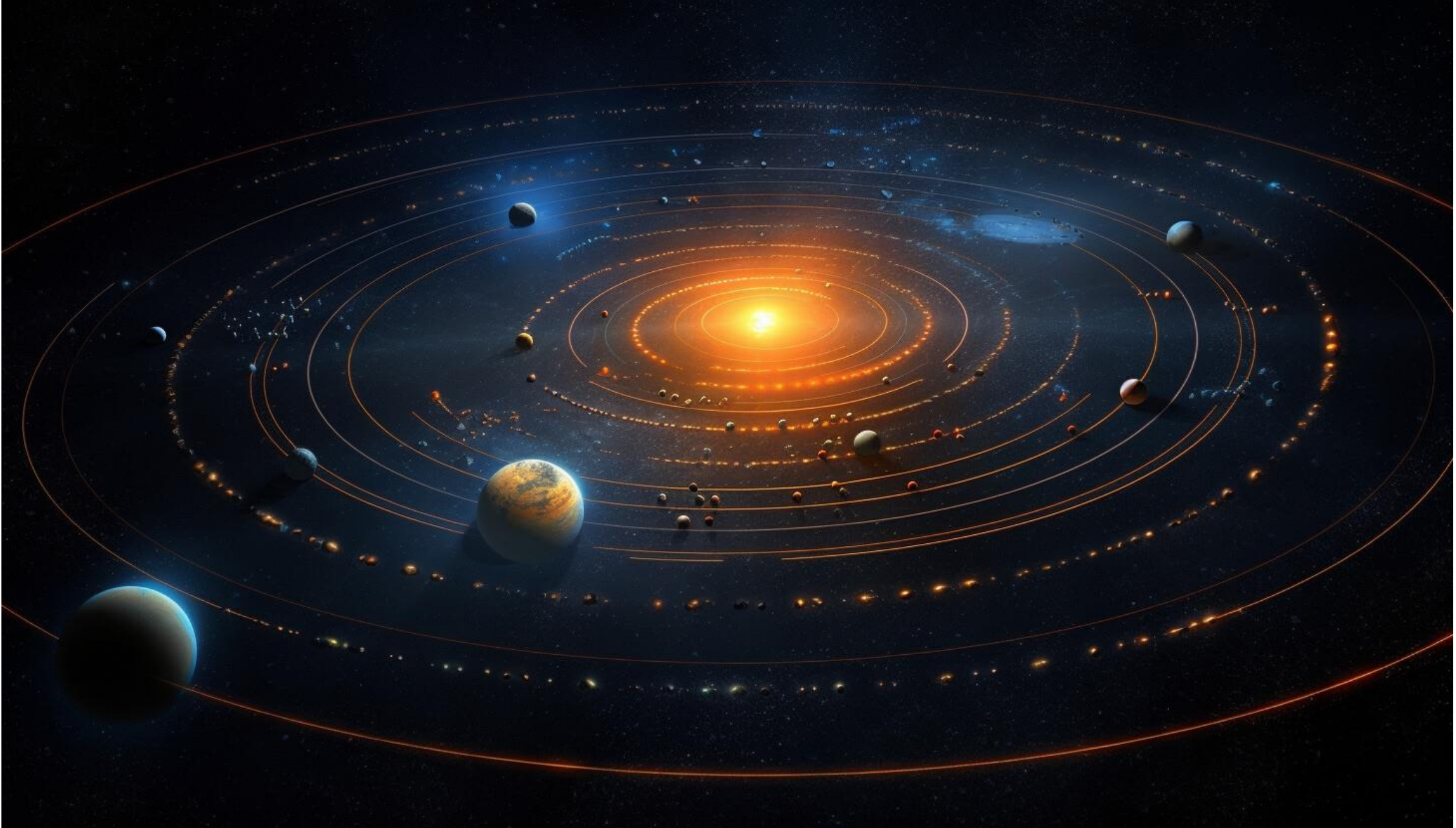
- o Lox : Twirl, Leap, Spin, Twirl, Leap

- o Faelis : Spin, Twirl, Leap, Leap, Spin

■ 문제 : <https://github.com/microsoft/CopilotAdventures/blob/main/Adventures/1-Beginner/The-Magical-Forest-of-Algora.md>

■ 솔루션 : <https://github.com/microsoft/CopilotAdventures/blob/main/Solutions/Python/The-Magical-Forest-of-Algora.py>

GitHub Copilot Adventure : 루모리아의 천체 정렬



GitHub Copilot Adventure : 스톤베일의 전설적인 결투



GitHub Copilot Adventure : 엘도리아의 스크롤



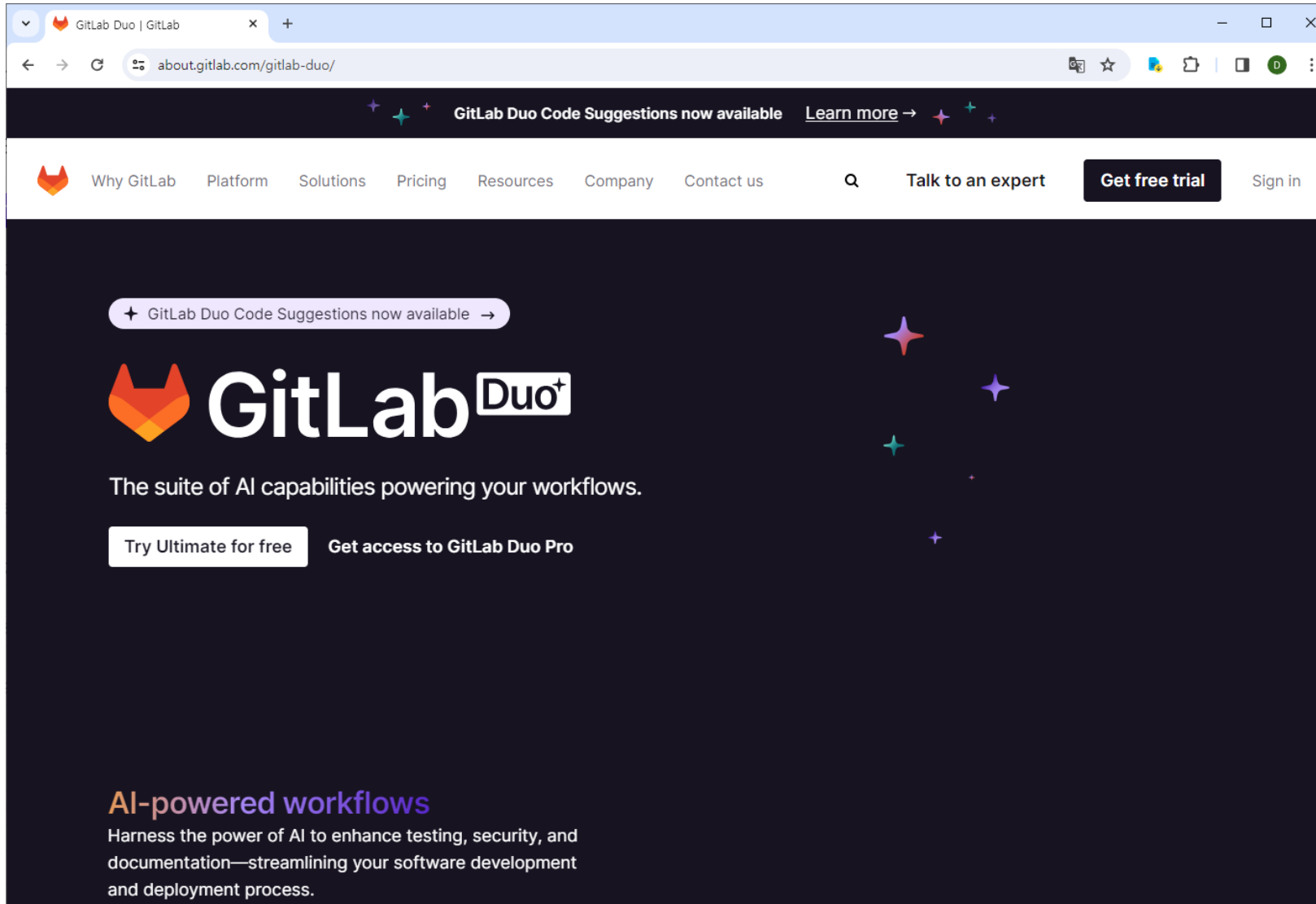
<https://github.com/microsoft/CopilotAdventures/blob/main/Adventures/2-Intermediate/The-Scrolls-of-Eldoria.md>

GitHub Copilot Adventure : 미토스의 그리드랙 아레나

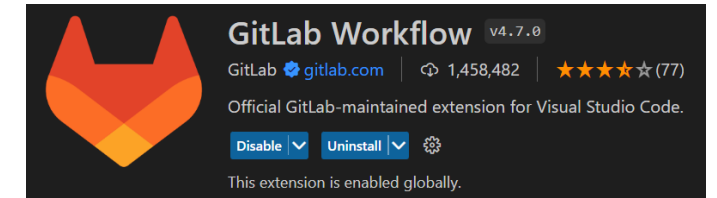


GitLab Duo

<https://about.gitlab.com/gitlab-duo/>



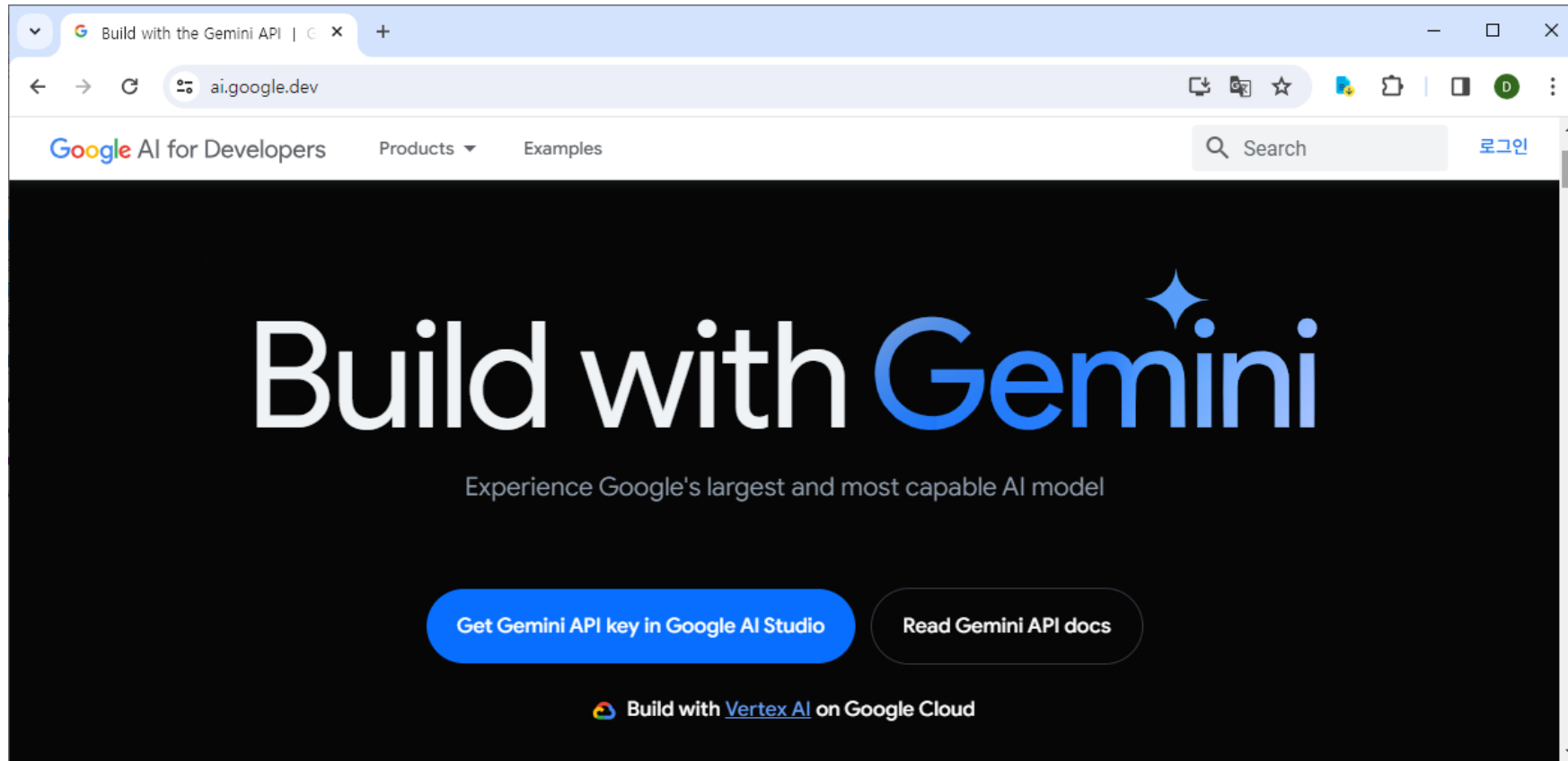
- VS Code
GitLab Workflow Extension 설치



- Code Suggestions
- Duo Chat
- Repository X-Ray

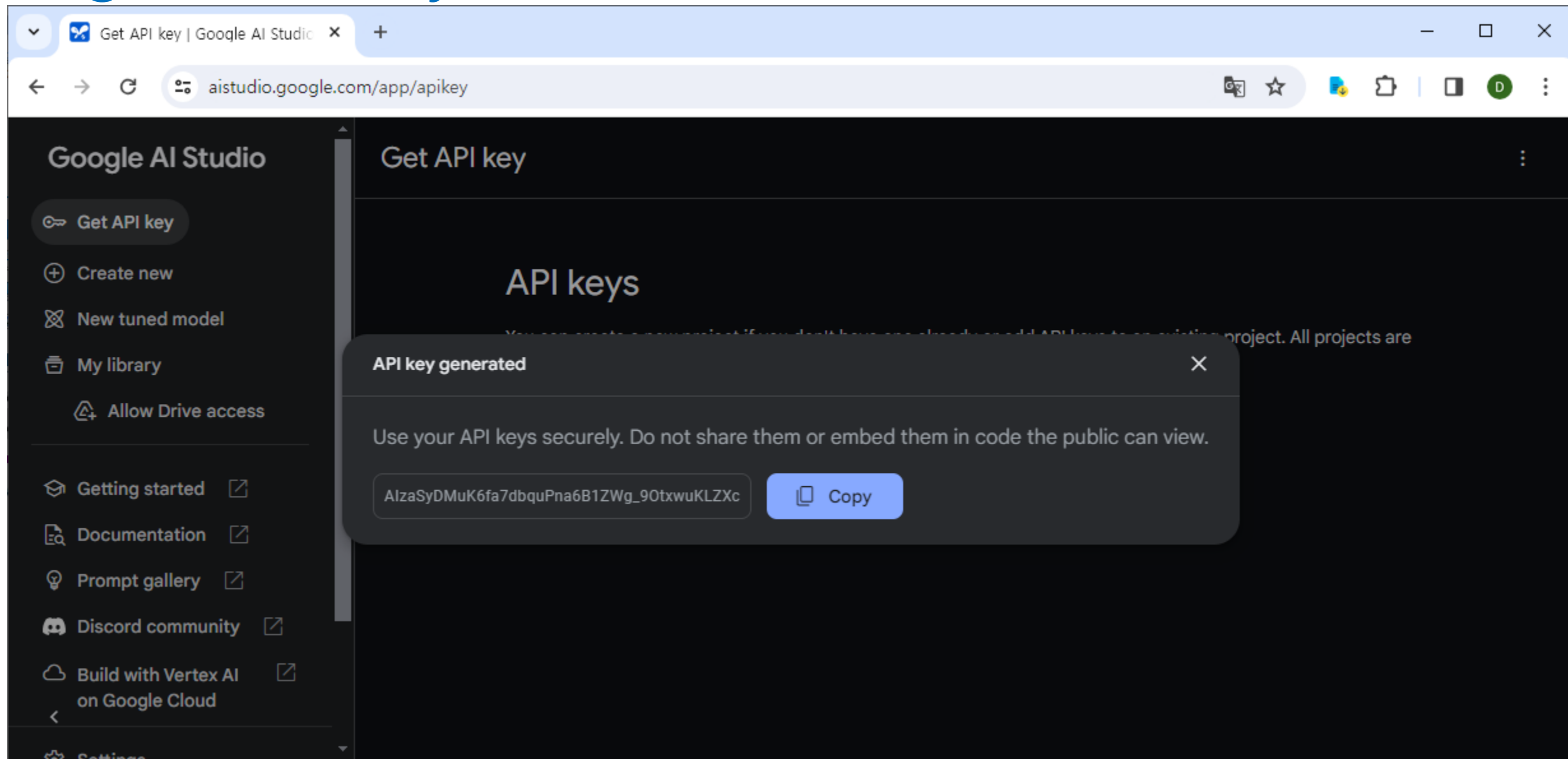
Google Gemini

<https://ai.google.dev/>



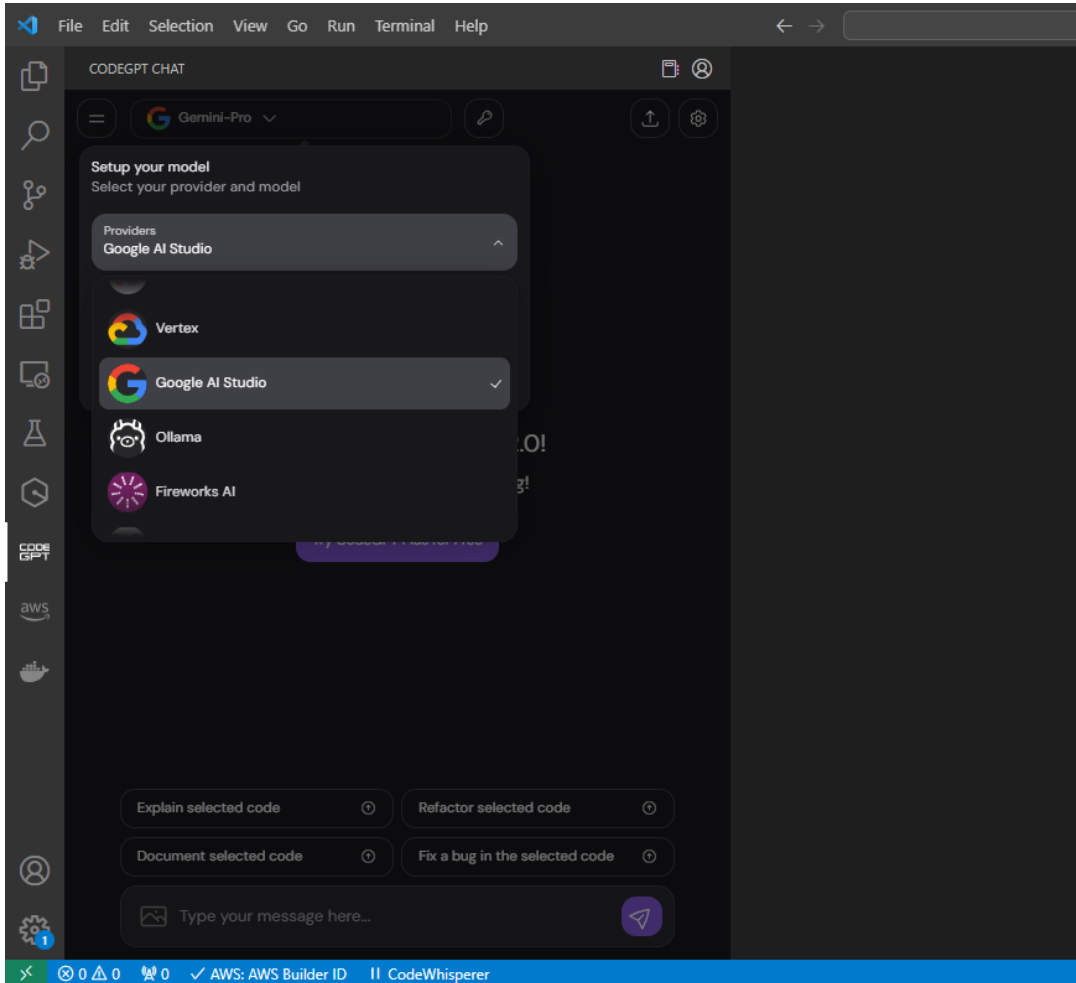
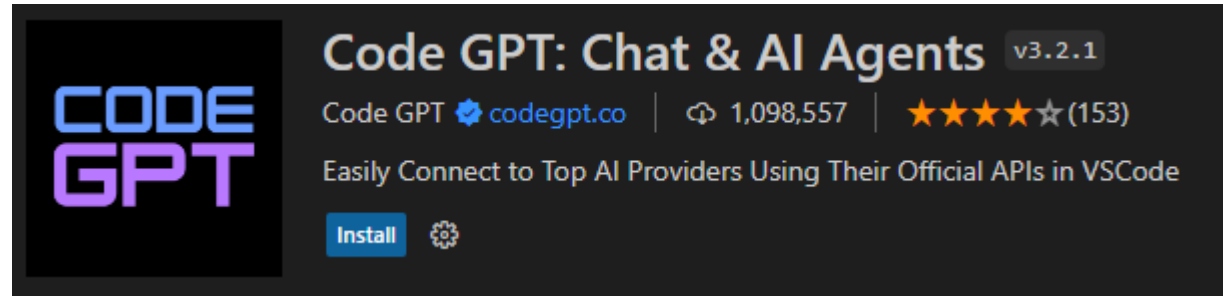
Free of charge	Pay-as-you-go
Rate Limits*	Rate Limits*
60 QPM (queries per minute)	Supported beyond 60 QPM

Google AI API Key

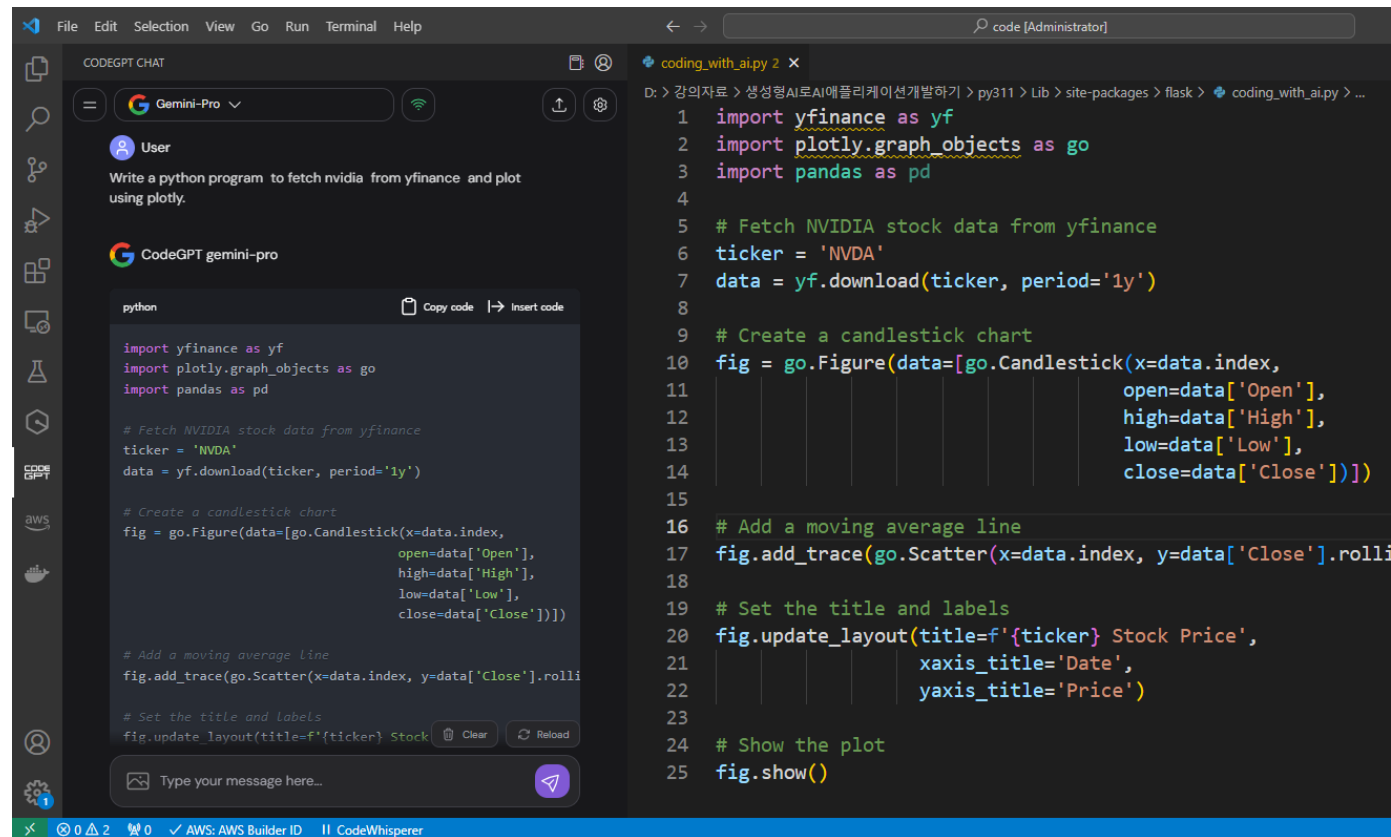


Code GPT

VS Code Extension Code GPT 설치



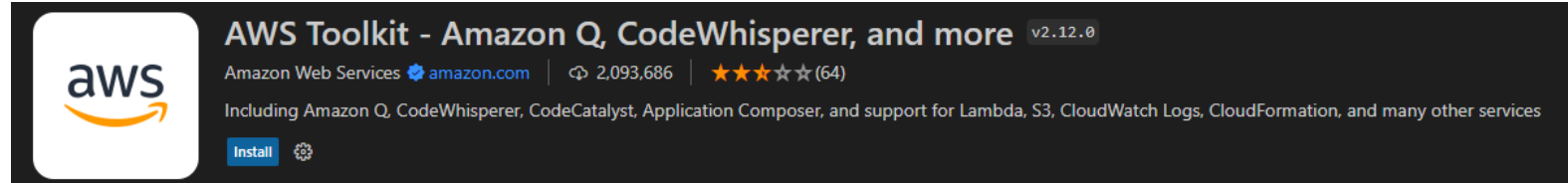
Write a python program to fetch nvidia from yfinance and plot using plotly.



Amazon CodeWhisperer

VS Code Extension

AWS Toolkit for Visual Studio 2022 설치



- 실시간 코드 제안 - 15개 이상의 언어로 자동 코드 추천, CloudFormation, AWS CDK, Terraform 등 인프라 코드도 포함
- AWS 서비스와 함께 사용하도록 최적화 - Amazon EC2, Lambda, S3를 비롯한 AWS API에 최적화
- 보안 검사 - 코드를 스캔하여 찾기 어려운 취약점을 감지하고 즉시 수정할 수 있는 코드 제안

Amazon CodeWhisperer

The screenshot shows the AWS Toolkit for VS Code interface. The left sidebar contains navigation links for AWS, AMAZON Q (PREVIEW), CODEWHISPERER, EXPLORER, and CODECATALYST. The main panel displays the 'Select a sign-in option to continue:' screen. A confirmation dialog is open, asking to confirm the code 'RWNL-XXVR' for the AWS Builder ID. The dialog has 'Proceed To Browser' and 'Cancel' buttons.

Visual Studio Code

Confirm Code for AWS Builder ID

Confirm this code in the browser: RWNL-XXVR

[Proceed To Browser](#) [Cancel](#)

Amazon Q + CodeWhisperer

Build, maintain, and train AI models. [Learn more.](#)

[Follow instructions...](#)

[Use Professional License](#)

Resource Explorer

Connected with profile default

- US East (N. Virginia)
- US East (Ohio)
- API Gateway
- App Runner
- CloudFormation
- testlambdafunctionstack [UPDATE_COMPLETE]
- testlambdafunctionstack-AwsSnsAutoDepend... [CREATE_COMPLETE]
- testlambdafunctionstack [CREATE_COMPLETE]
- CloudWatch Logs

[Use Single Sign-on \(SSO\)](#)

[Or, provide IAM Roles Credentials](#)

Don't have an AWS account? [Sign up for free.](#)

Amazon CodeCatalyst

Spend more time coding and less time managing development environments. [Learn more.](#)

[Use for free with AWS Builder ID](#)

[Use Single Sign-on \(SSO\)](#)

Don't have a CodeCatalyst account? [Get started with creating a Space.](#)

Google Colab

The image displays two screenshots of the Google Colab web interface. The left screenshot shows the 'Untitled0.ipynb' notebook with a red box highlighting the '생성' (Generate) button in the bottom right corner. The right screenshot shows the same notebook with the 'Colab AI' button highlighted by a red box. Below the 'Colab AI' button, a side panel is open, displaying AI-generated code and prompts. The code in the side panel is as follows:

```
# prompt: import data_csv as as a dataframe

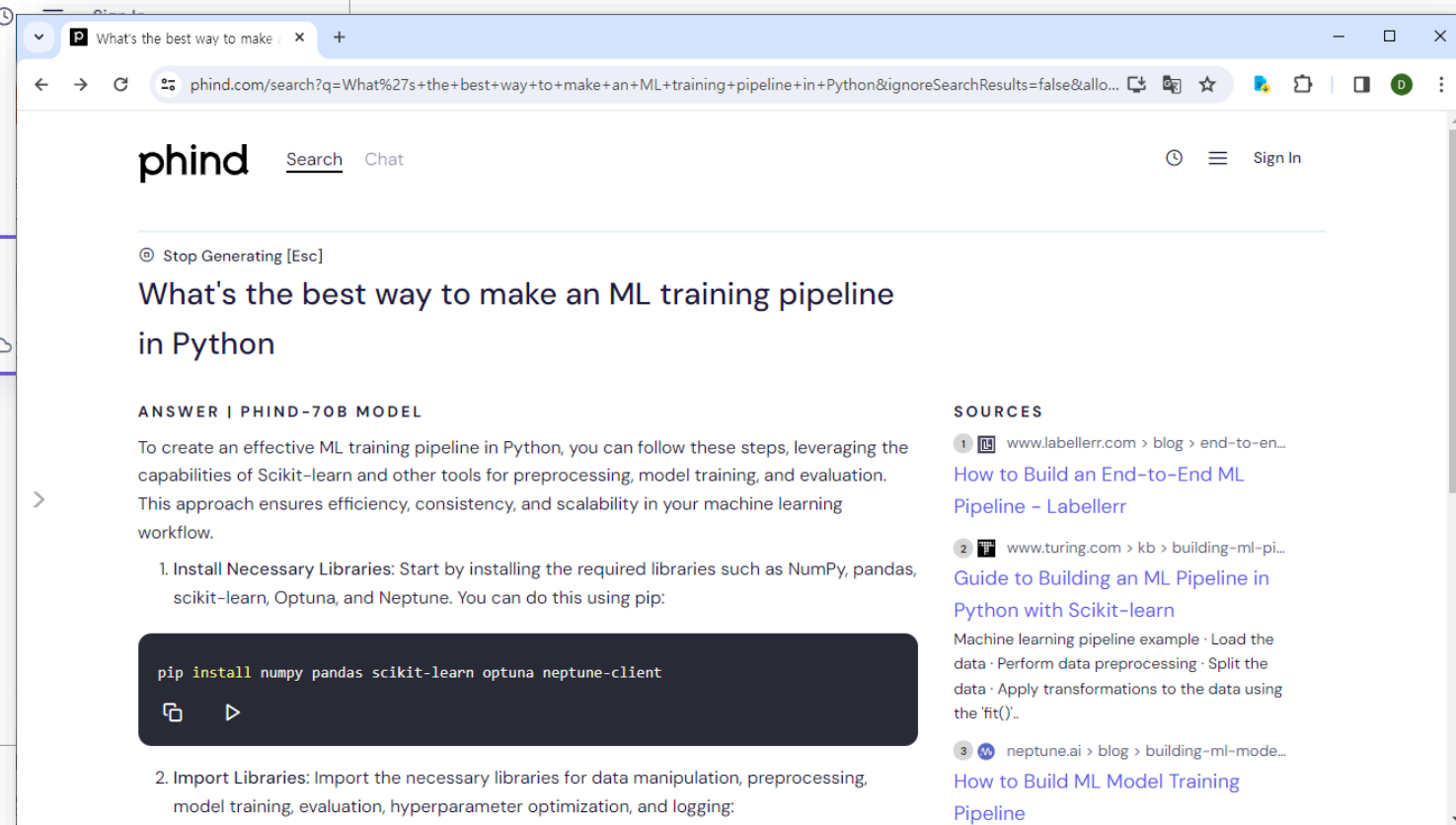
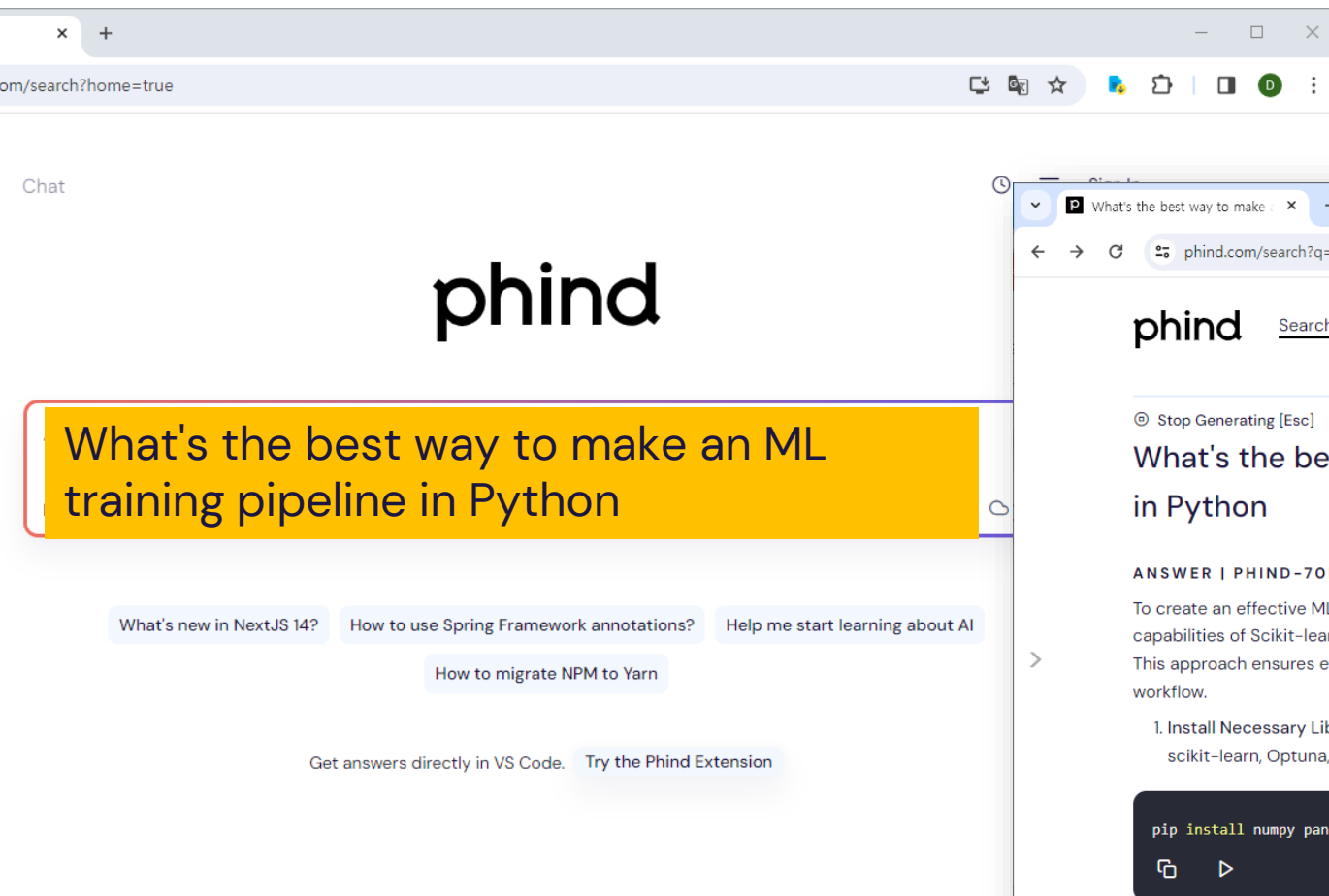
import pandas as pd

# Read the CSV file into a pandas DataFrame
data_csv = pd.read_csv('data.csv')

# Print the DataFrame
print(data_csv)
```

The side panel also includes a text input field with the placeholder text '여기에 메시지를 입력하세요.' (Enter message here.) and a character count '0 / 400'. Below the input field, there is a disclaimer in Korean: '답변에 Google의 관점을 반영하지 않는 부정확하거나 불쾌감을 주는 정보가 표시될 수 있습니다. 자세히 알아보기' (Answers may not reflect Google's perspective and may contain inaccurate or offensive information. Learn more).

파인드 (Phind)



Thank you 😊