Software + AI Setup

1405 Instructor: Ruiqing (Sam) Cao

Checklist

- ❑ **Anaconda + Jupyter Notebook**
- ❑ **Virtual Environment (venv1405)**
- ❑ **Visual Studio Code**
- ❑ **VS Code + GitHub Copilot Integration**

Identify Your Operating System (OS)

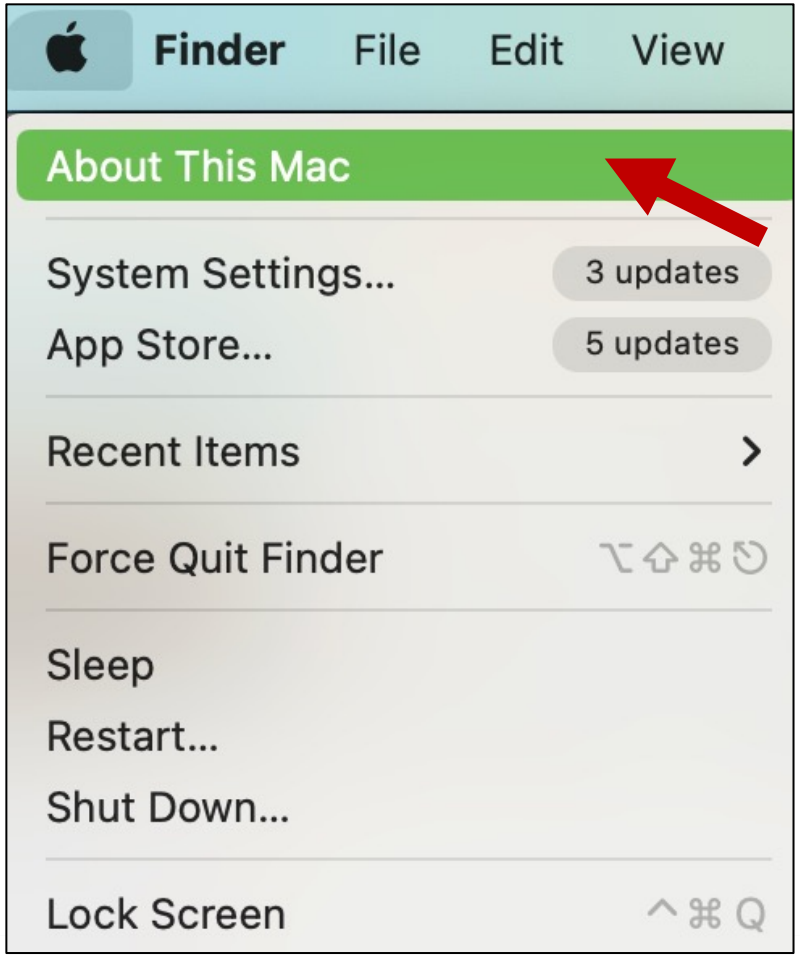
➢If your laptop is one of the following brands, it likely runs **Windows OS**: *Lenovo, HP (Hewlett-Packard), Dell, Acer, Microsoft (Surface series), ASUS, Huawei*

➢If your laptop is a MacBook, it likely runs **macOS** and uses

- **Intel chip** if your macOS matches one of the following versions: *Catalina (10.15), Mojave (10.14), High Sierra (10.13), Sierra (10.12), El Capitan (10.11), Yosemite (10.10), Mavericks (10.9), Mountain Lion (10.8)*
- **M1 chip** if if your macOS version is *Sonoma (14.x), Sequoia (15.x), Tahoe (26)*
- *Either an Intel chip or an M1 chip* if your macOS matches one of the following versions: *Ventura (13.x), Monterey (12.x), Big Sur (11.x)*

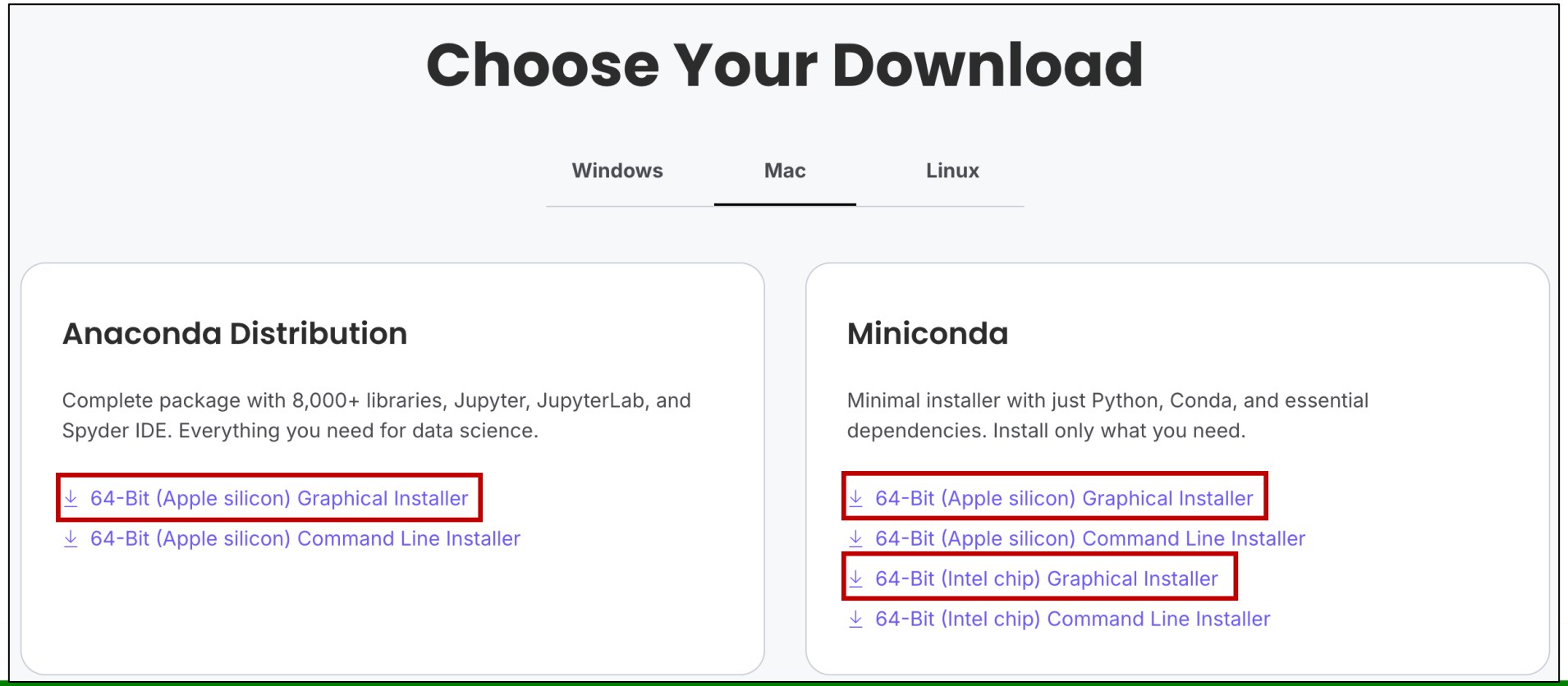
Check If Your Mac Uses M1 or Intel Chip

- Click the Apple icon in the top-left corner of your screen
- Select "About This Mac" from the dropdown menu
- A new window will display your macOS chip information



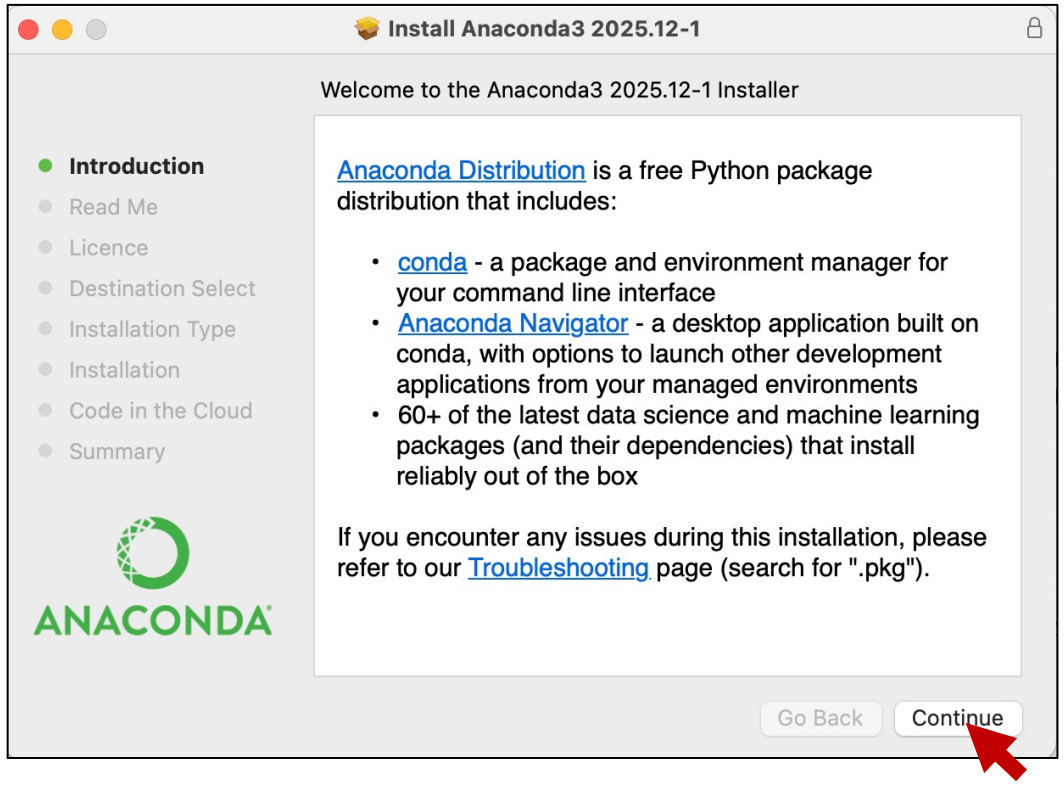
Download Anaconda for Your OS

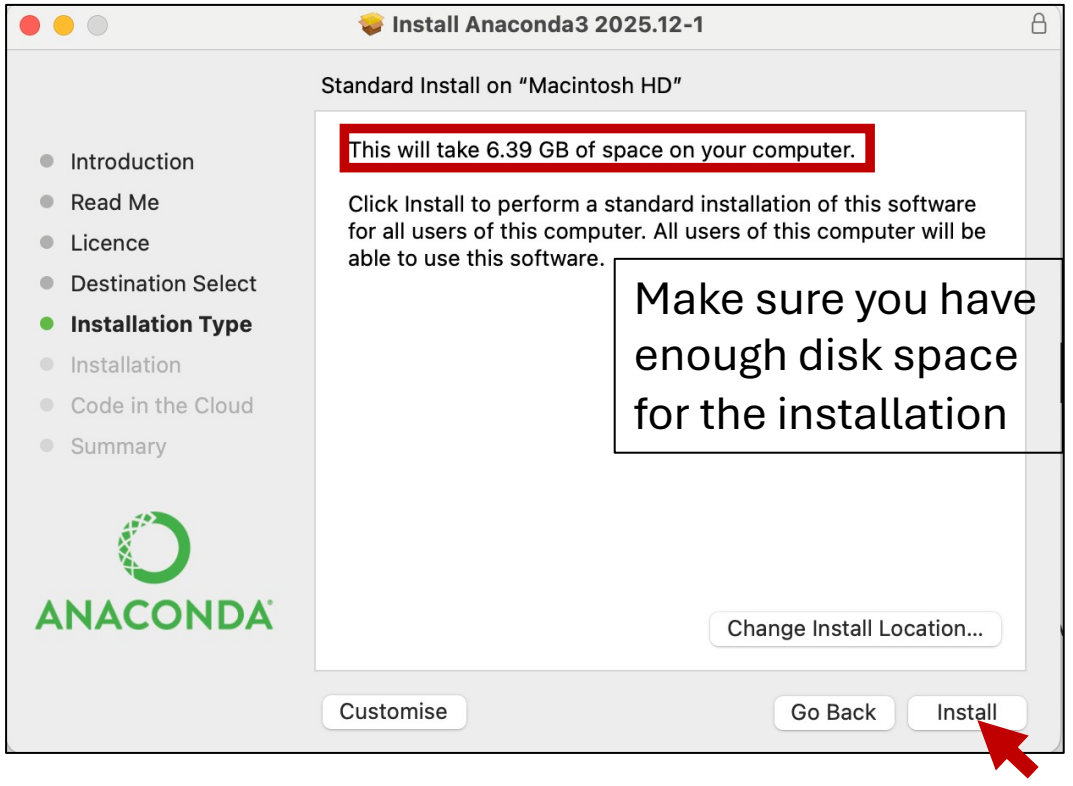
- Go to https://www.anaconda.com/download/success (or visit the Download page for Anaconda and skip registration)



Install Anaconda (macOS)

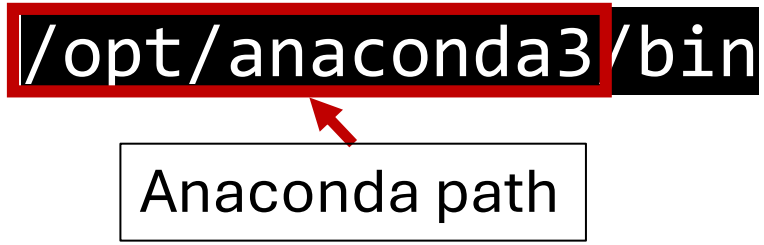
- The installation process should complete in a few minutes





Check Anaconda Directory & Version

- Open a Terminal and run "`echo $PATH`" to locate Anaconda. Look for file paths containing "`anaconda3`"



- Run "`conda --version`" to confirm Anaconda installation. The output should display the version number, indicating it is ready to use

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Create a Virtual Environment

- Create **separate virtual environments** for different projects, especially when the projects involve distinct libraries (e.g., visualization, traditional ML, deep learning)

- Make sure you are connected to the Internet. Open a terminal and run the command below to create a virtual environment named venv1405 for this course

```
conda create -n venv1405 python=3.14
```

➢When prompted `proceed ([y]/n)?` Type `y` and hit Enter

➢You will see this when venv1405 is set up:

```
# To activate this environment, use
#
#     $ conda activate venv1405
#
# To deactivate an active environment, use
#
#     $ conda deactivate
```

Use a Virtual Environment

Open a new Terminal

- To activate the virtual environment `venv1405`, run:
  `conda activate venv1405`
- To list all Conda environments and see which one is active (marked with an asterisk *), run:
  `conda info --envs` or `conda env list`
- To deactivate the current virtual environment, run:
  `conda deactivate`

Register a Virtual Environment

To use a virtual environment in Jupyter Notebook, register it in the IPython kernel with these steps:

- Activate the virtual environment

```
conda activate venv1405
```

- Make sure `ipykernel` is installed inside the virtual environment

```
pip install ipykernel
```

- Add the virtual environment to Jupyter as a kernel, and choose a display name for it within Jupyter

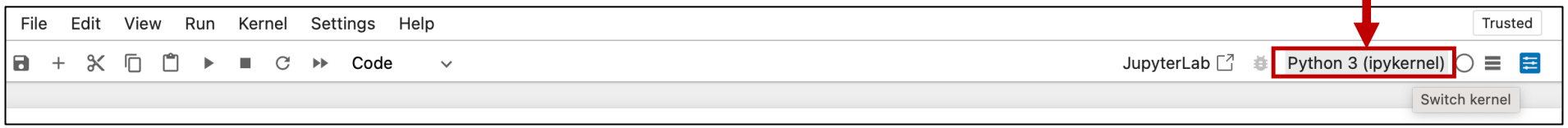
```
python -m ipykernel install --user --name=venv1405 -
        -display-name "Python (venv1405)"
```

Select a Virtual Environment in Jupyter

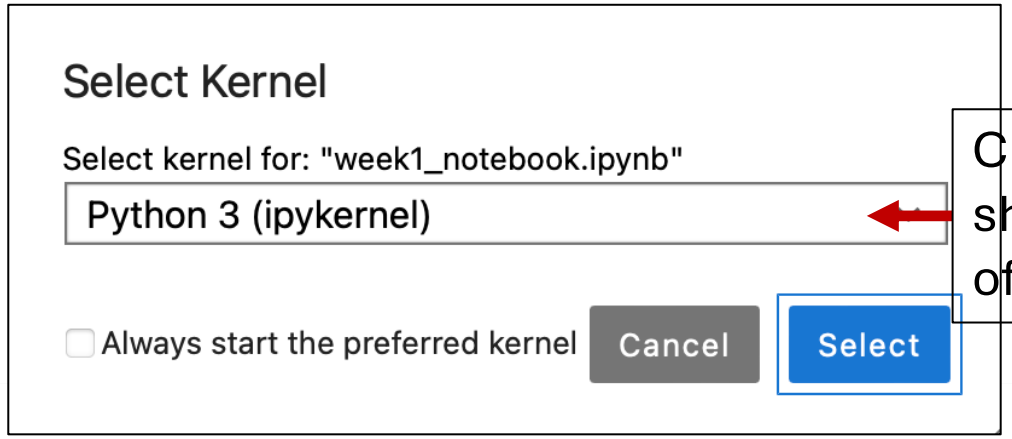
Open a new Terminal (make sure `venv1405` is deactivated here)

- Run "`jupyter notebook`" to open the Jupyter Notebook interface in your web browser. Create a new Notebook (.ipynb) or open an existing one, and click on ipykernel from the top-right corner

1.

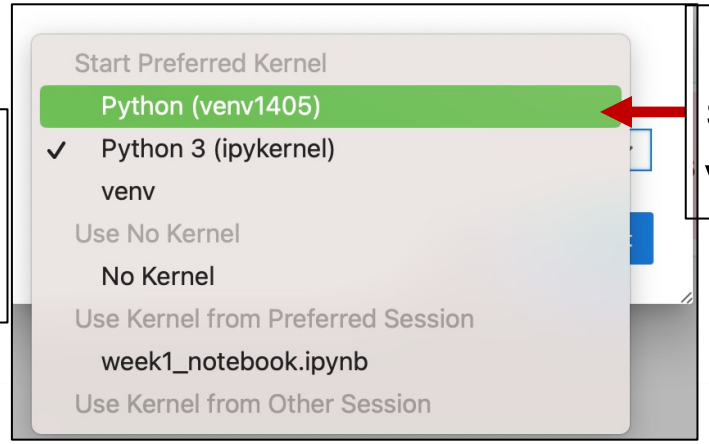


2.



Click to show list of kernels

3.



Find and select venv1405

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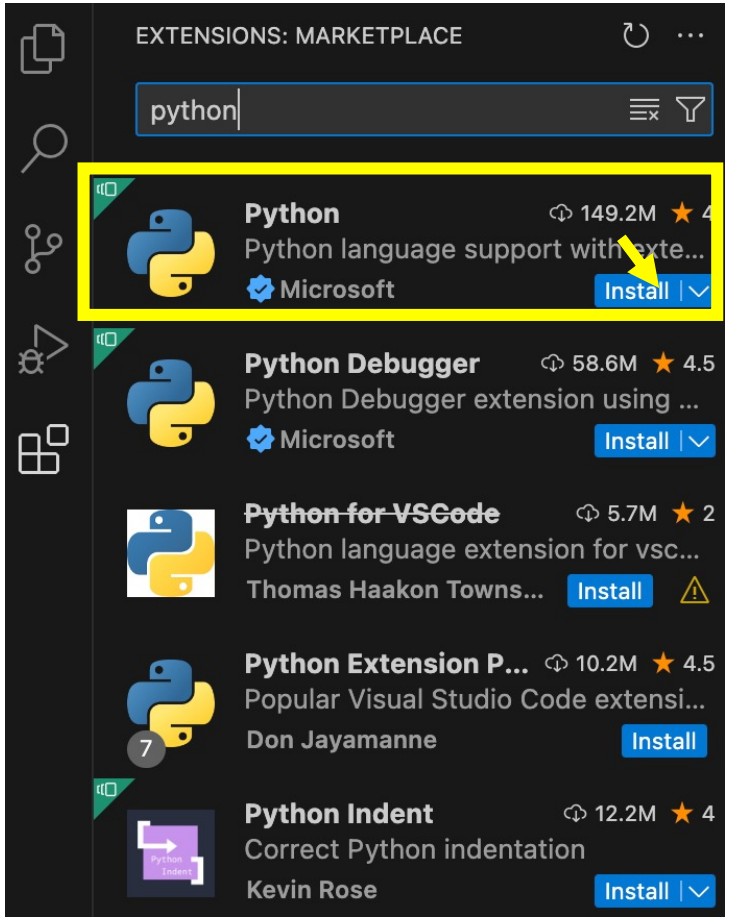
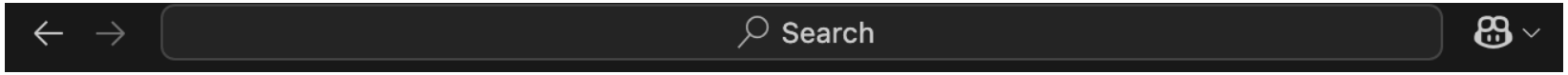
Install Visual Studio Code (VS Code)

- Visit https://code.visualstudio.com and download the appropriate Visual Studio Code version for your OS
- Locate the downloaded file (Visual Studio Code.app) and move it to **/Applications**
- Open Visual Studio Code, go to *View* > *Extensions*, search for "Python" in the Marketplace, and install the Python extension by Microsoft

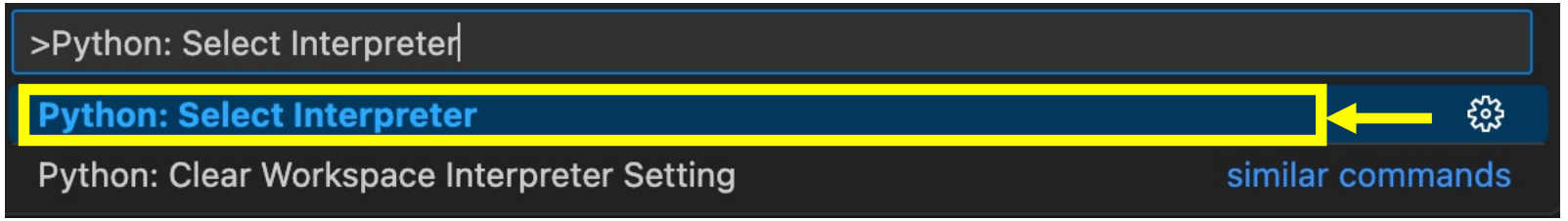


Configure Python Interpreter in VS Code

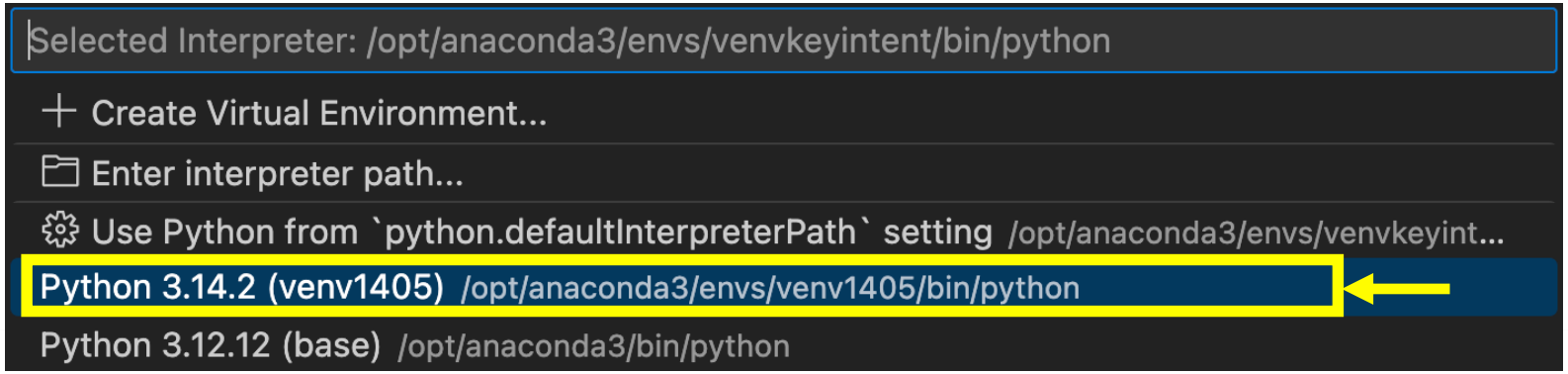
- Find the search bar



- Type "*>Python: Select Interpret*" and select from the dropdown list

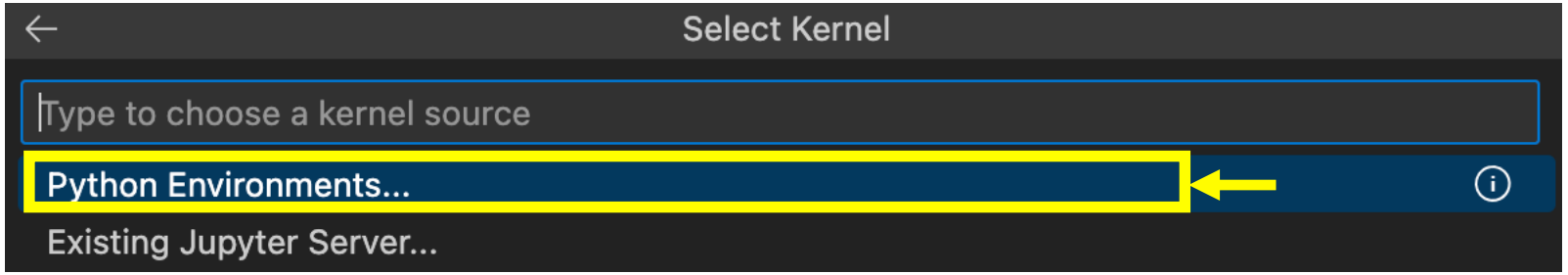


- Find the virtual environment "venv1405" and click on it

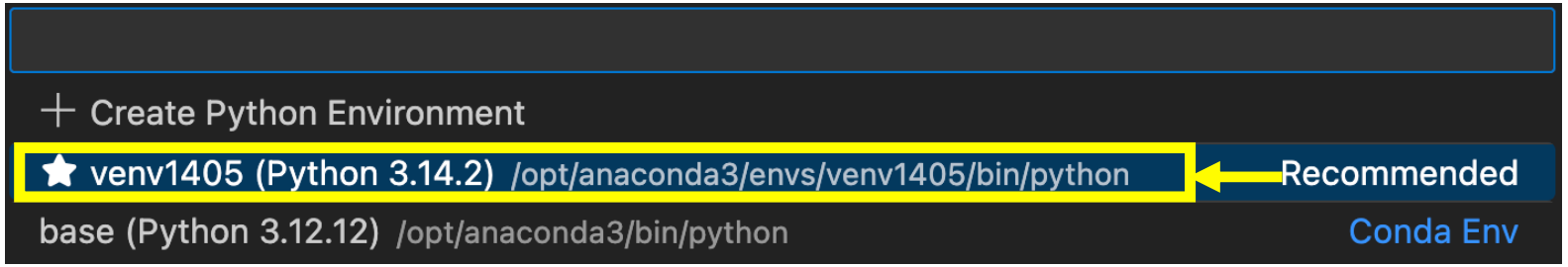


Select Kernel to Run Jupyter in VS Code

- If you try to run a code block in a Jupyter notebook (.ipynb), you may be asked to select a kernel, click on “Python Environments”



- Select the virtual environment venv1405 created for the course



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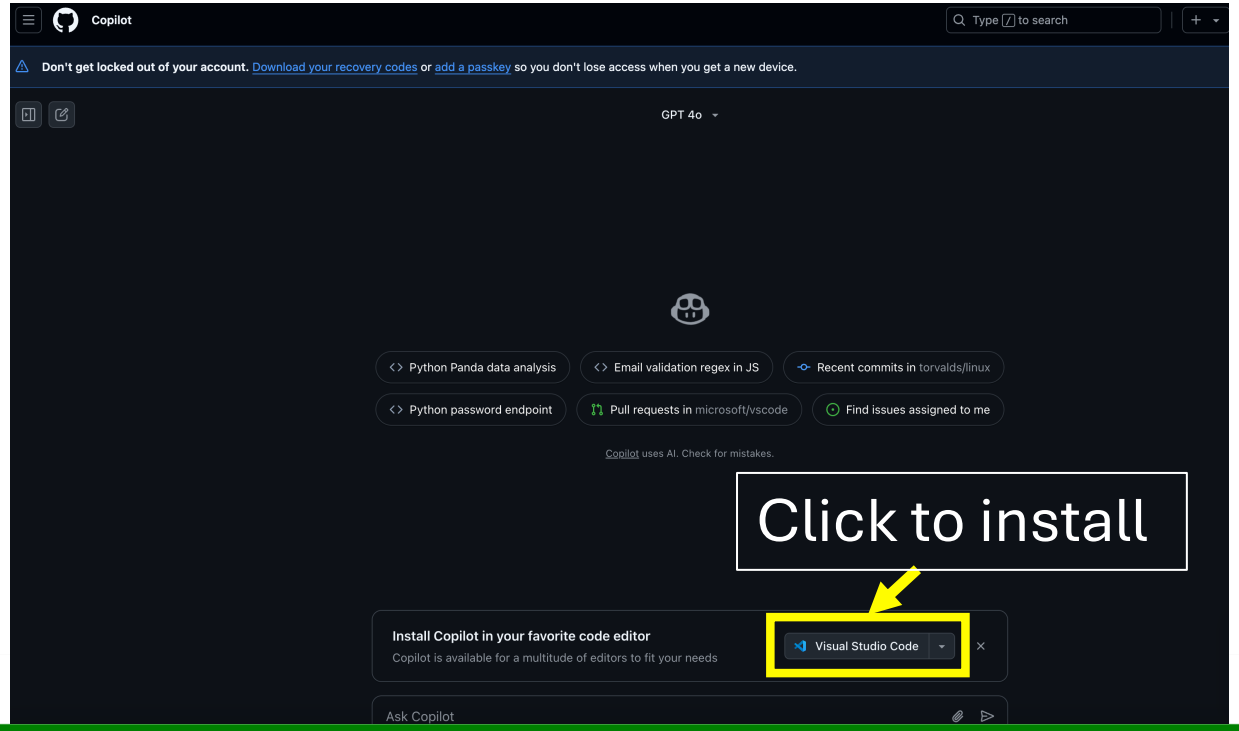
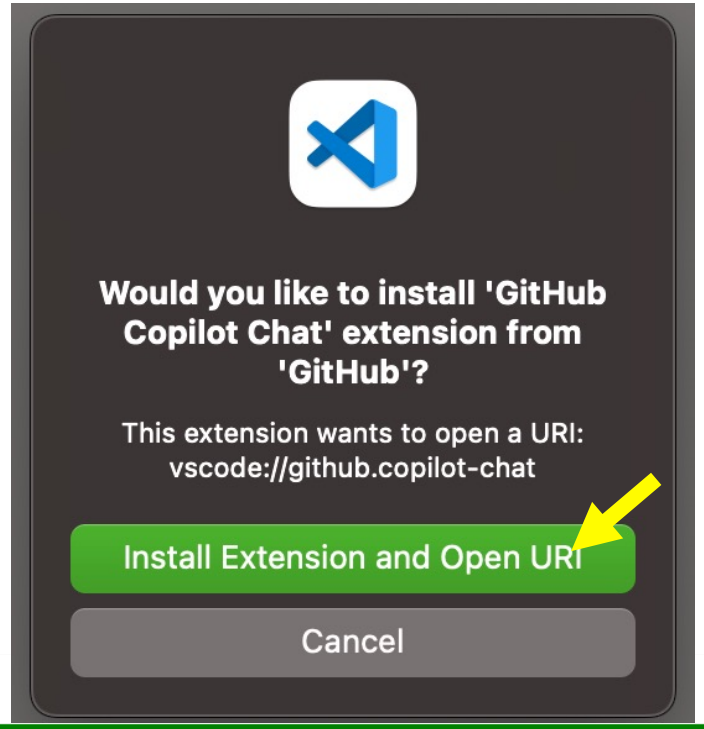
Install GitHub Copilot for VS Code

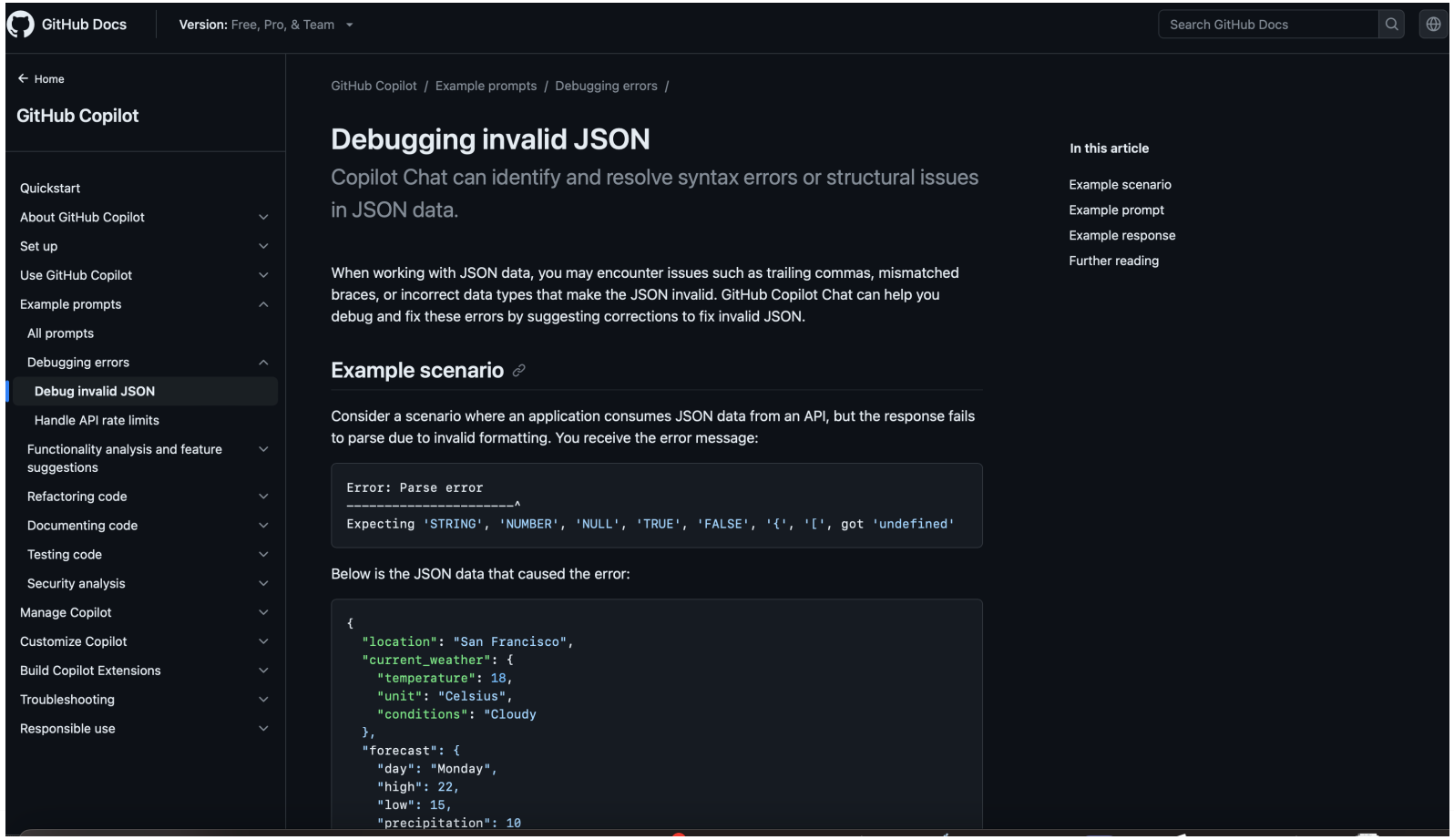
- GitHub offers ***free*** Copilot integration for VS Code. Sign up for a GitHub account at https://github.com using a valid email address
- Log into your account, and go to https://github.com/copilot



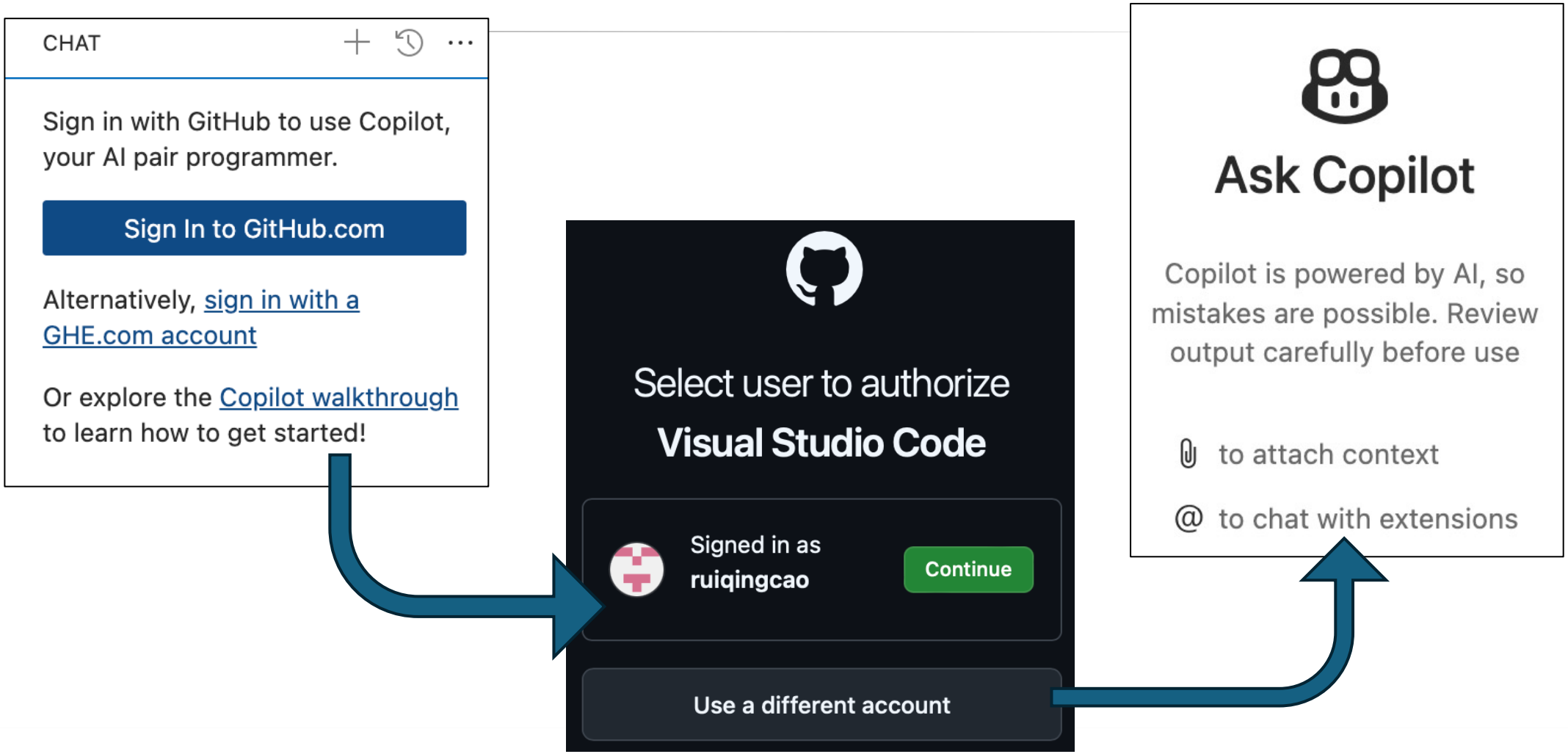


GitHub Copilot Documentation

For a user guide and examples of using GitHub Copilot, see https://docs.github.com/copilot



Sign Into GitHub from VS Code



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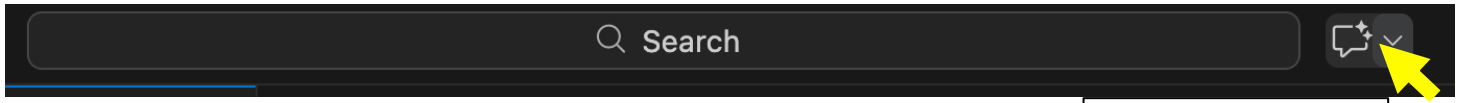
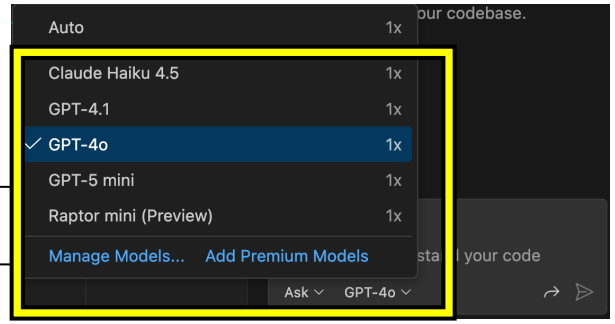
Ask Copilot for Programming Help

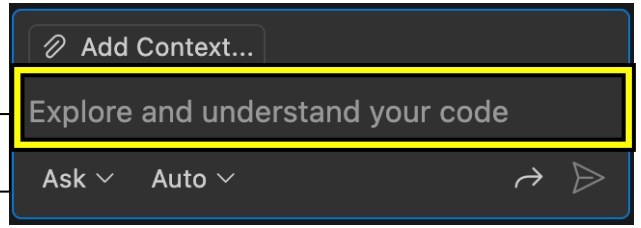


Open Chat

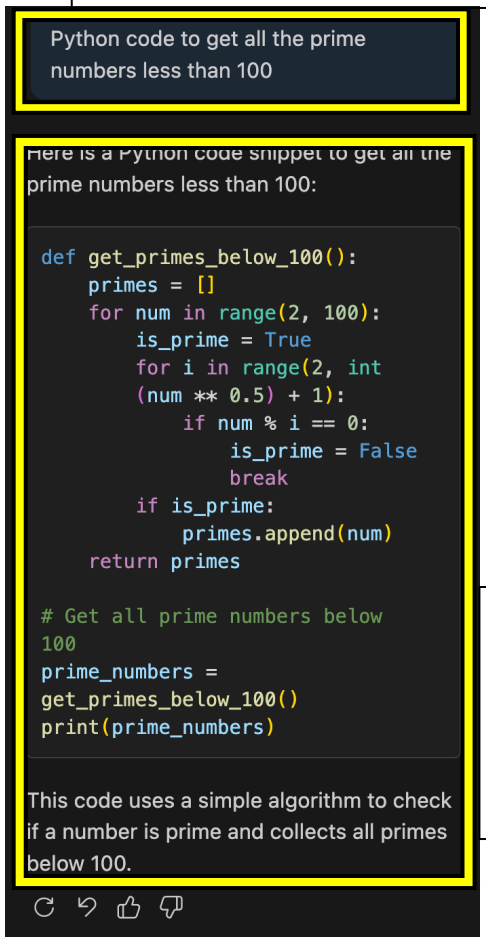
Your question shows up here



Choose an LLM here



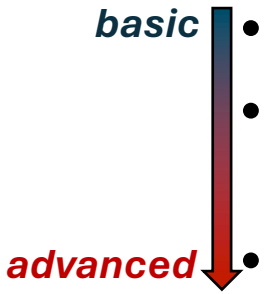
Type your question here



Copilot's answers show up here

Use AI Tools for Programming Help

- Too many options these days…



  - Conversational interfaces: ChatGPT, Claude, Qwen
  - GitHub Copilot: GPT-4o and Claude Haiku 4.5 are free, but need to pay for premium models
  - Coding agents: Cursor, Claude Code

- You can ask programming questions directly to an LLM

→ But make sure to double check AI-generated answers, and modify any AI-generated code as needed to ensure accuracy

- Prompting tips:

(1) Break a task into smaller steps (2) Provide clear instructions for each step

GenAI Code Annotation Example

- Model: Claude Opus 4.5 (Anthropic)
- Prompting process (details in “få_leksakslösenord.ipynb”):
  - Copy and paste the code from “få_leksakslösenord.ipynb” into the Claude message box and press Enter
  - Claude will analyze the code and provide a detailed step-by-step explanation of each command
  - To request inline comments on the code, type: "Please add inline comments to the Python code" and press Enter
  - Claude will add comments to the code which explain the purpose of each line