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)

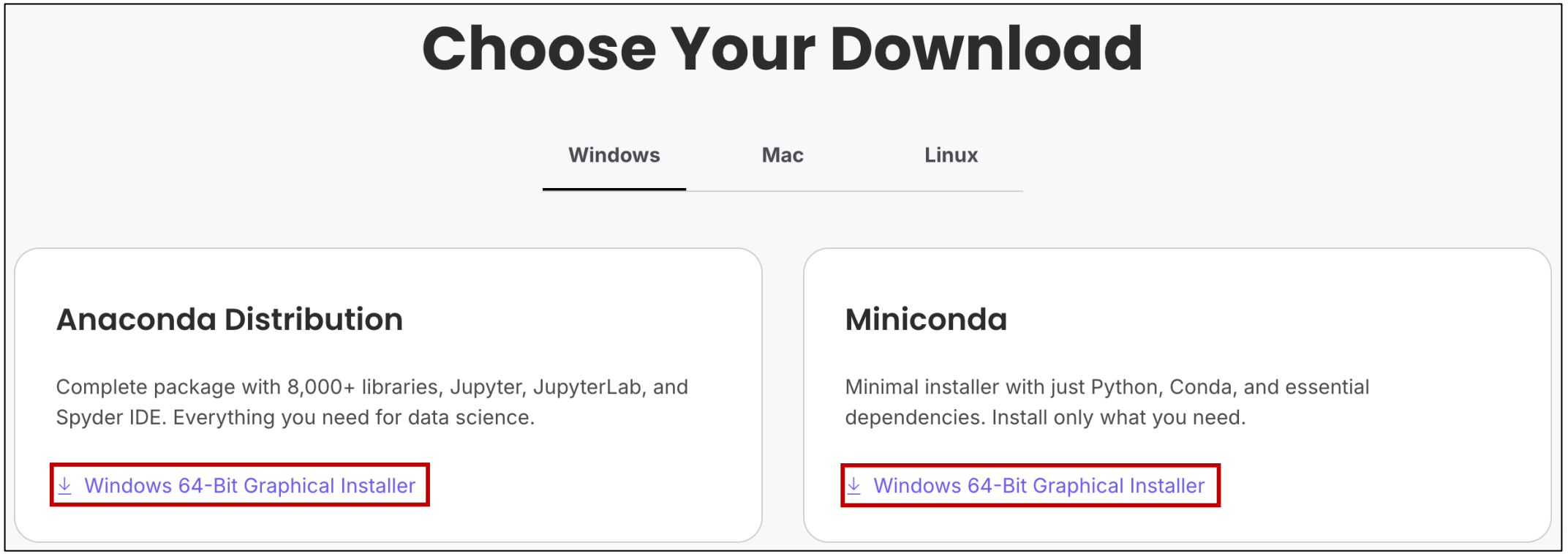
➢If your laptop is one of the following brands, it likely runs **Windows OS**: *Lenovo, HP (Hewlett-Packard), Dell, Acer, Microsoft (Surface series), ASUS, Huawei*

➢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)*

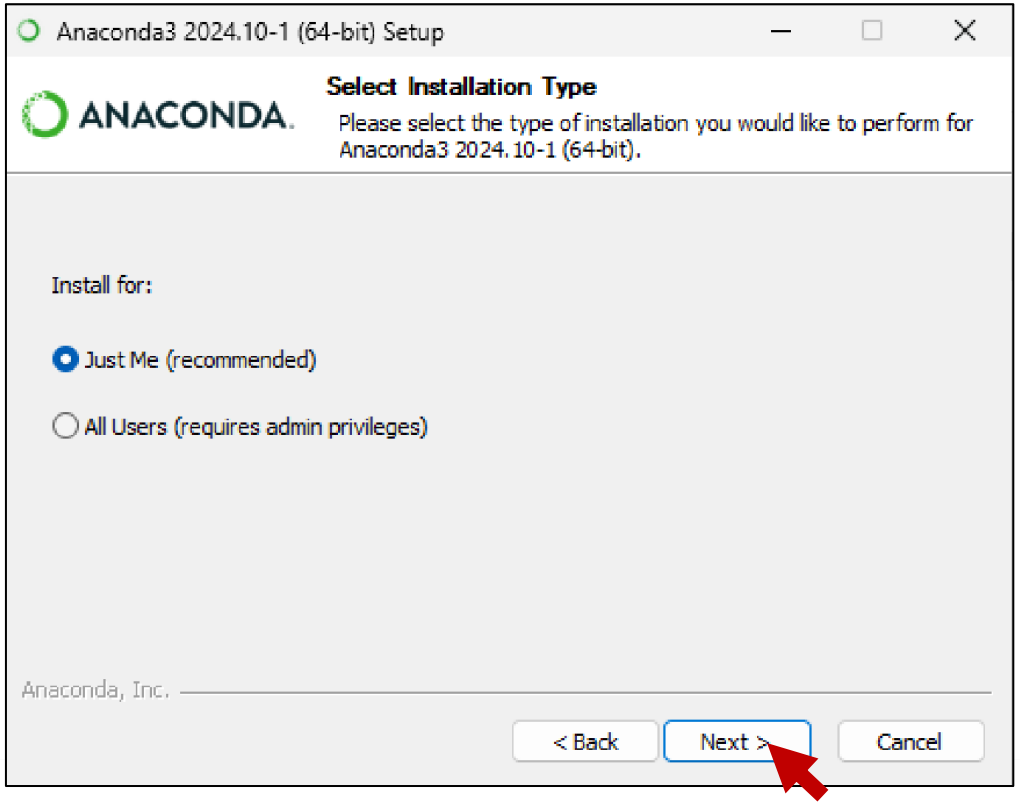
Download Anaconda for Your OS

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

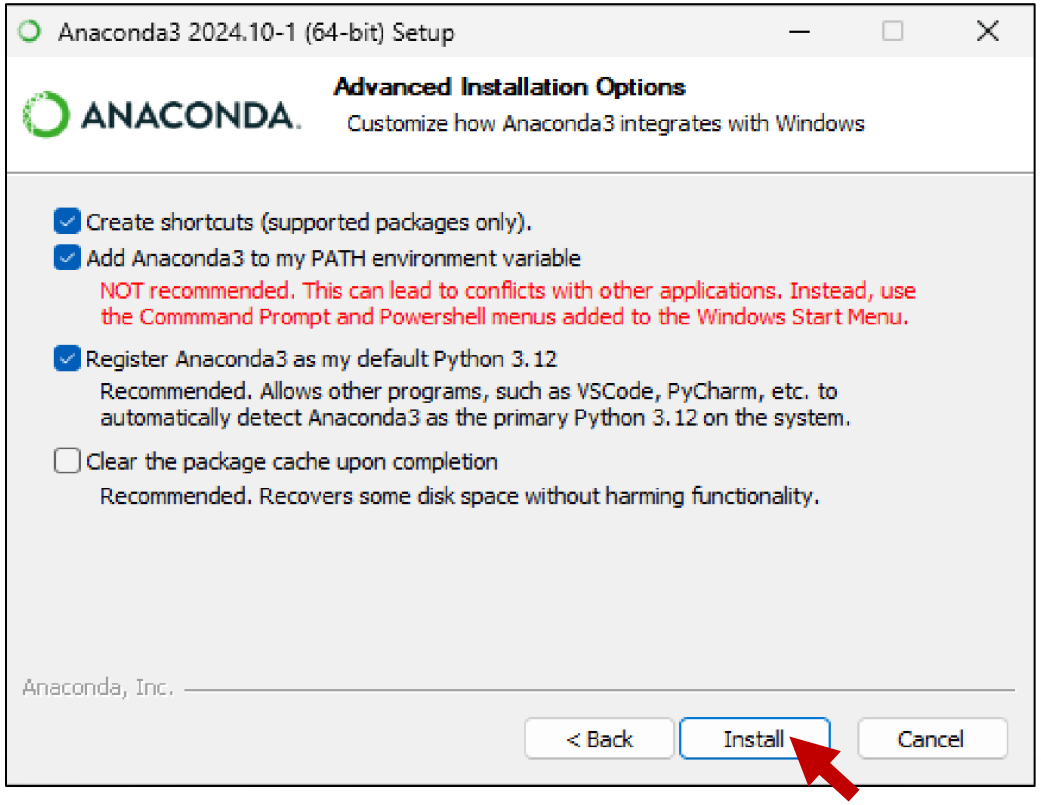


Install Anaconda (Windows)

Select “Just Me” to only install Anaconda for the local user



Select “Add Anaconda 3 to my PATH” (ignore recommendation)



Check Anaconda Directory & Version

- Open Anaconda Prompt 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 Anaconda Prompt 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 Anaconda Prompt

- 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)"
```

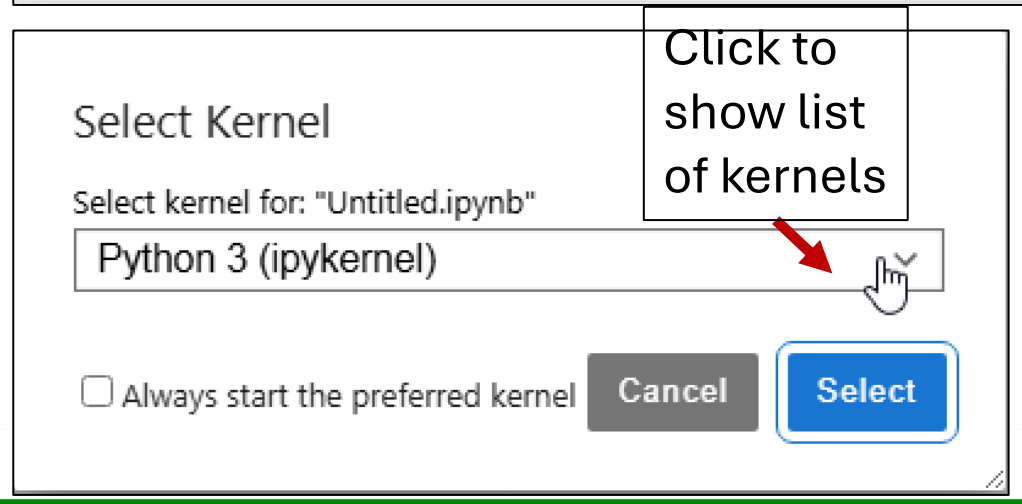
Select a Virtual Environment in Jupyter

Open Anaconda Prompt (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.



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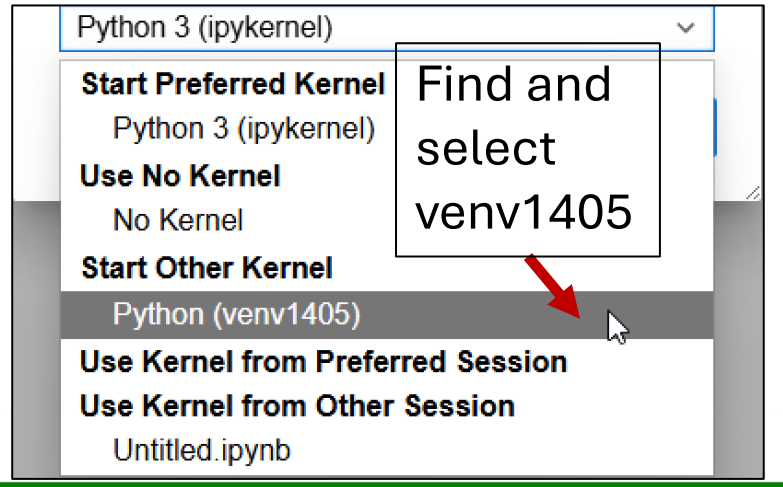

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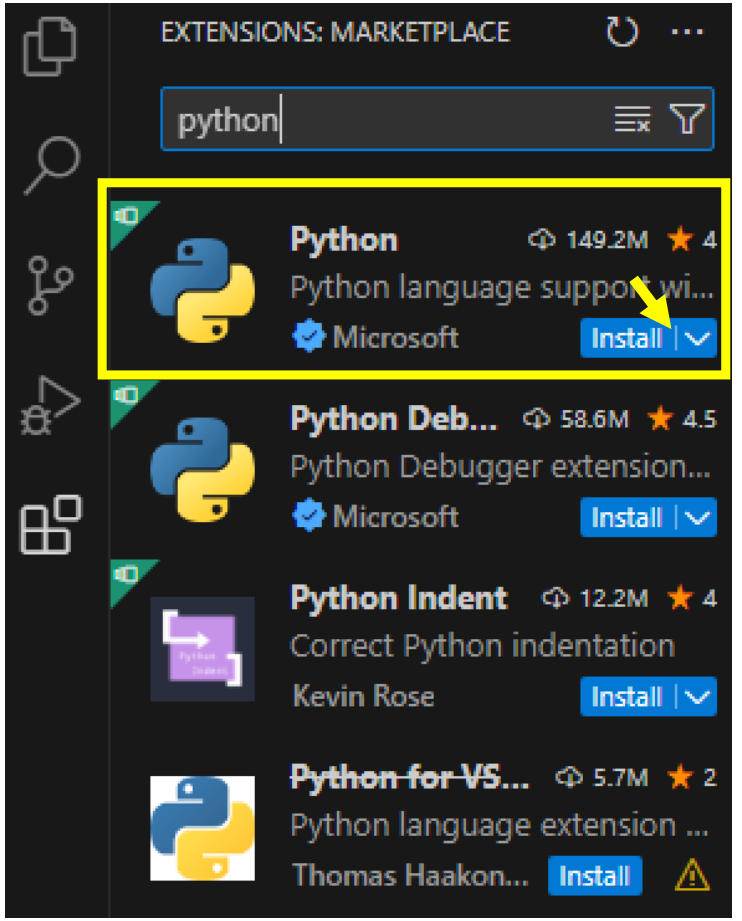
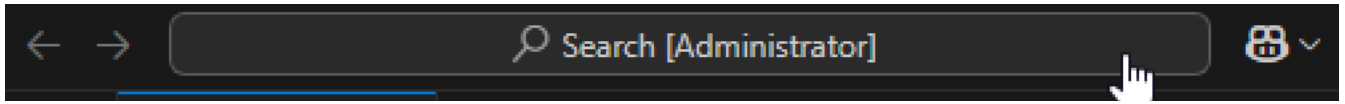
Install Visual Studio Code (VS Code)

- Visit https://code.visualstudio.com and download the appropriate Visual Studio Code version for your OS
- Locate and run the downloaded executable (.exe), and follow the instructions to install VS Code
- Open Visual Studio Code, go to *View* > *Extensions*, search for "Python" in the Marketplace, and install the Python extension by Microsoft

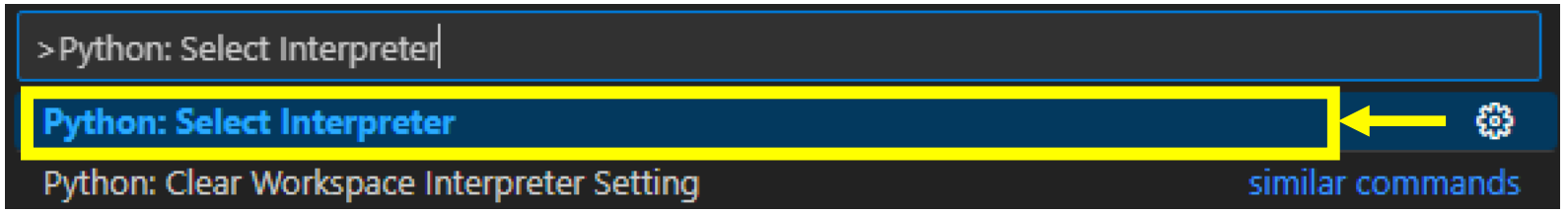


Configure Python Interpreter in VS Code

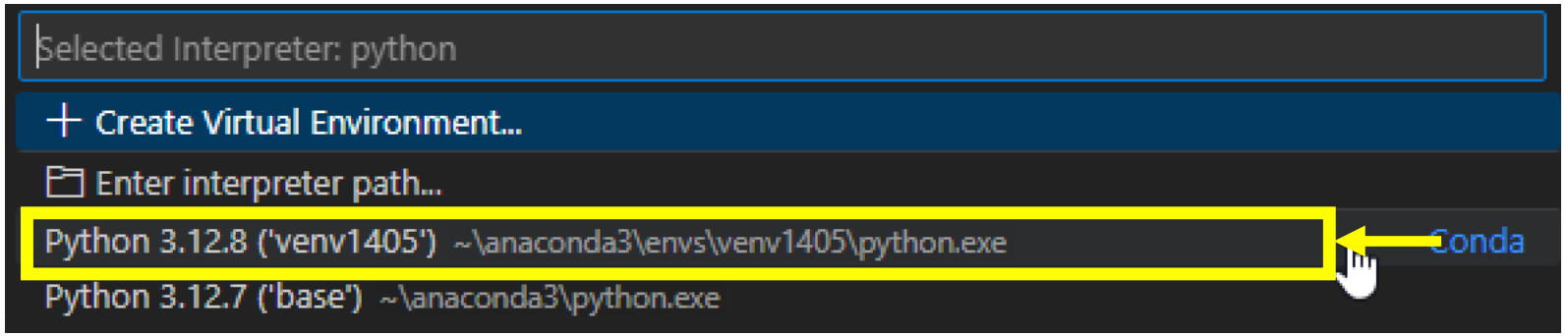
- Find the search bar



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

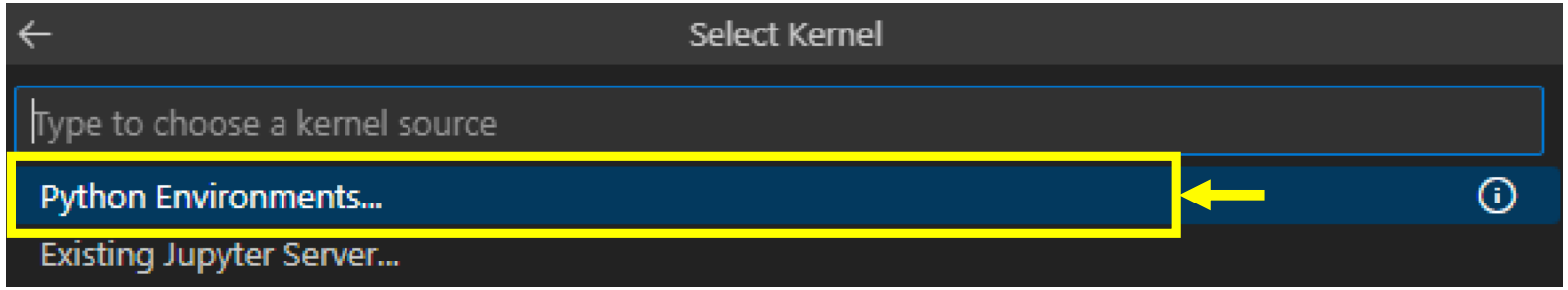


- Find the virtual environment "venv1405" and click on it

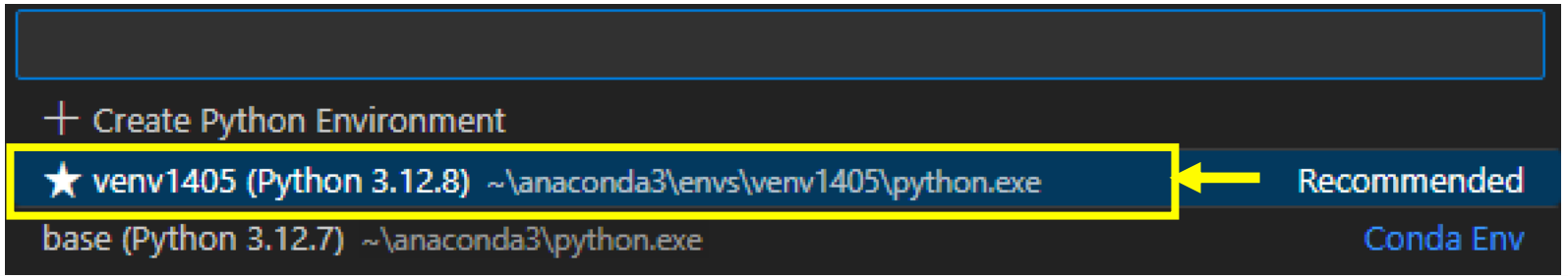


Select Kernel to Run Jupyter in VS Code

- 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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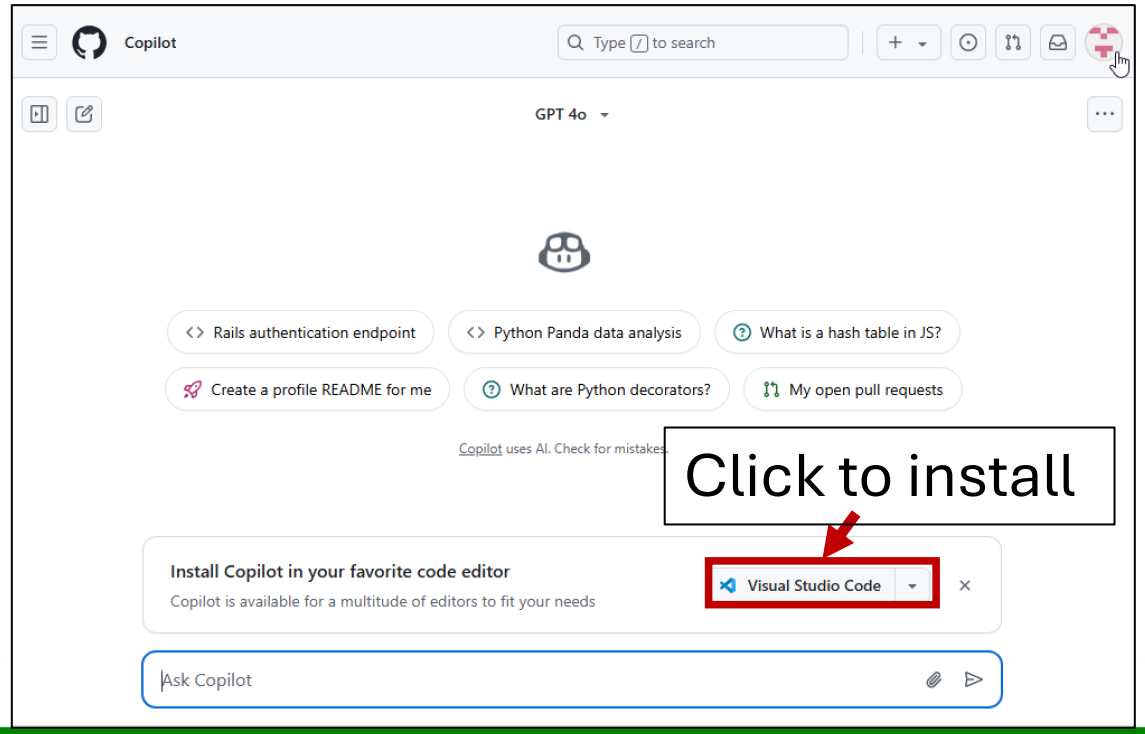
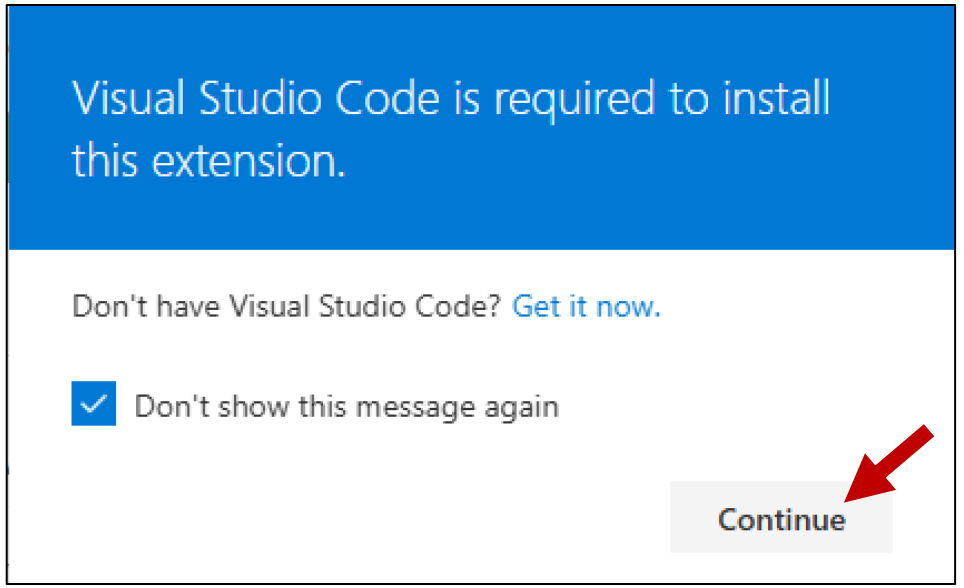
Install GitHub Copilot for VS Code

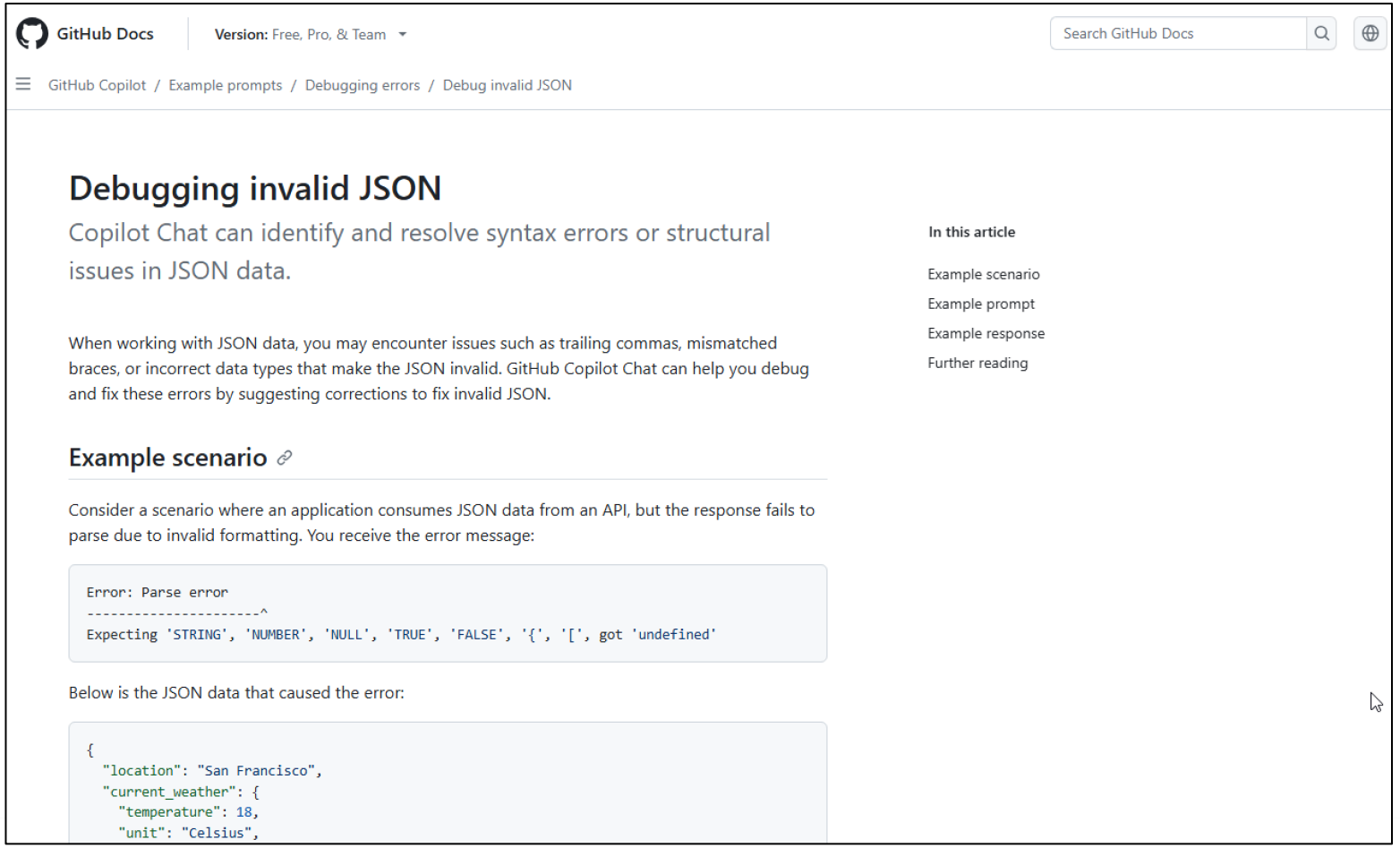
- GitHub offers ***free*** Copilot integration for VS Code. Sign up for a GitHub account at https://github.com using a valid email address
- Log into your account, and go to https://github.com/copilot



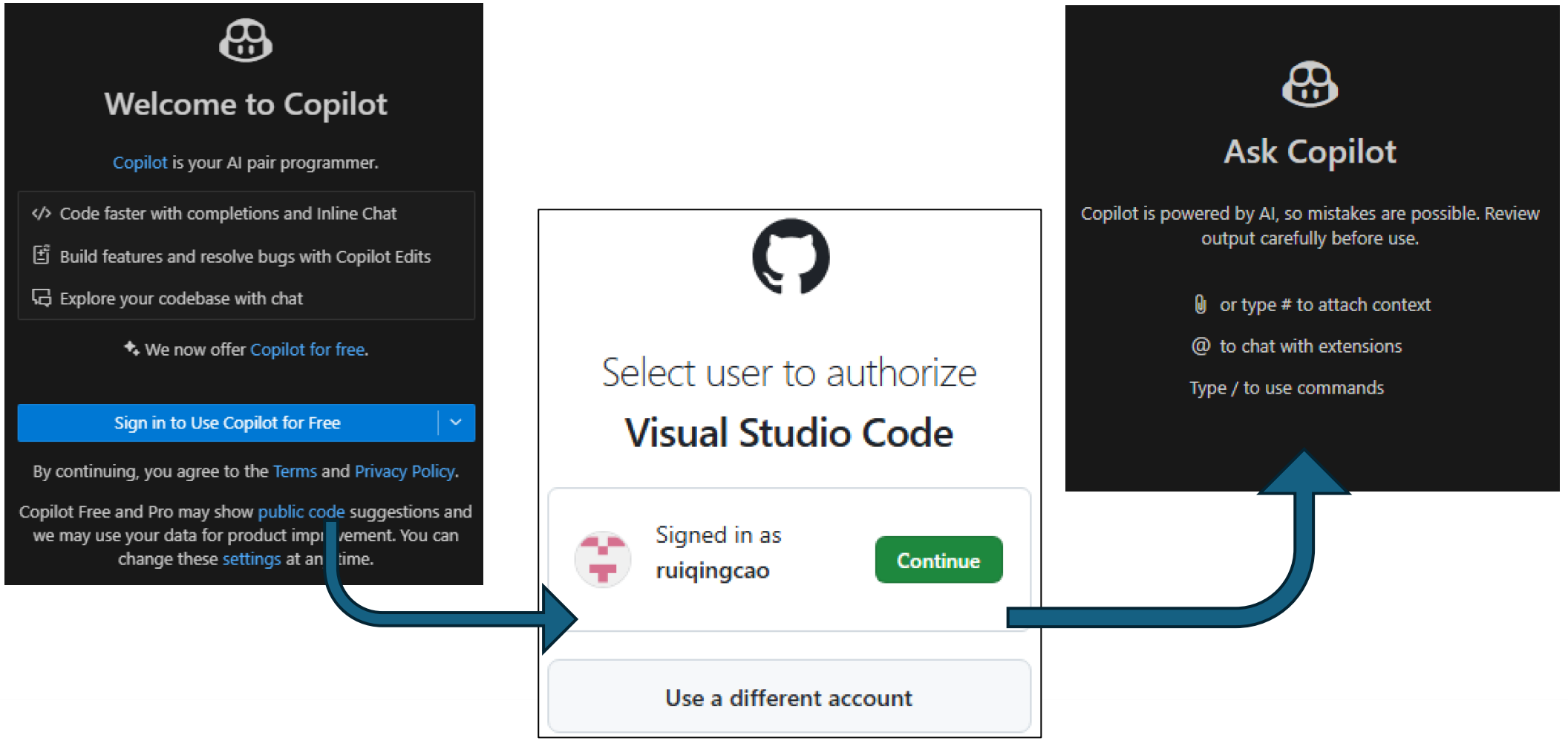


GitHub Copilot Documentation

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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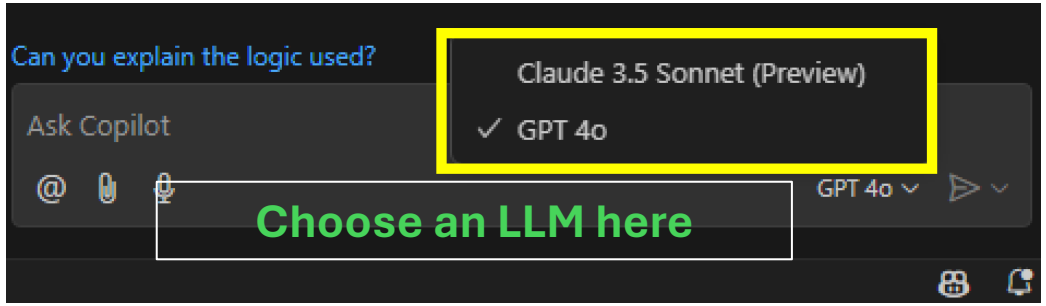
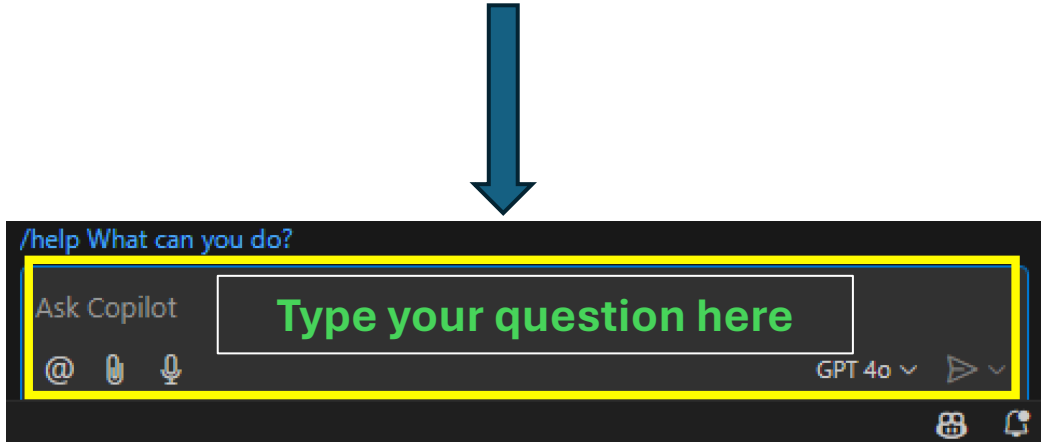
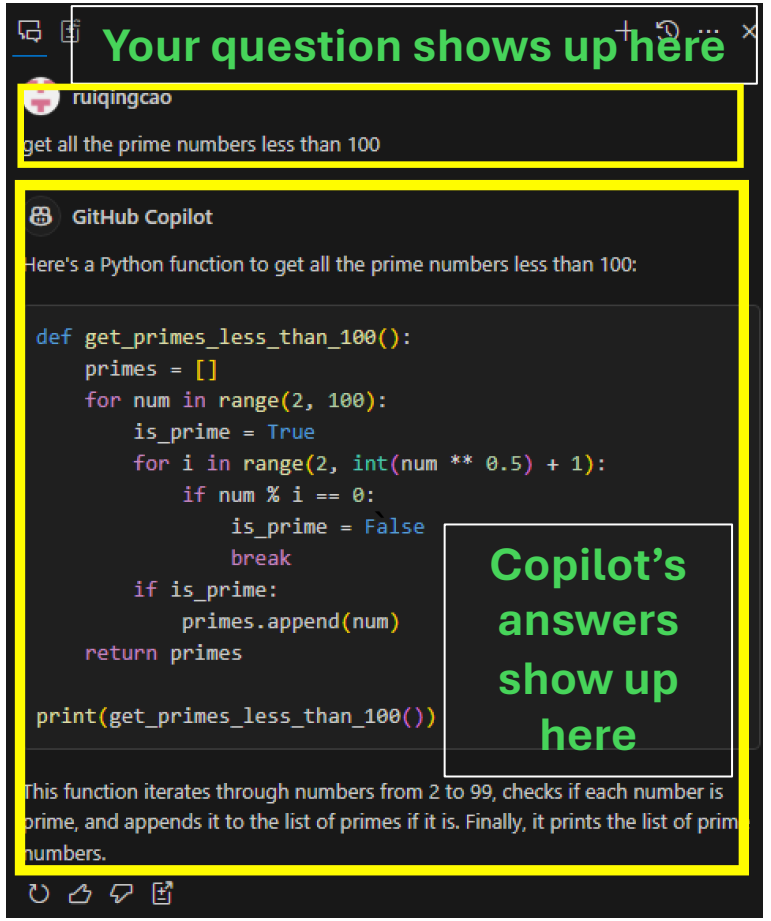
Ask Copilot for Programming Help

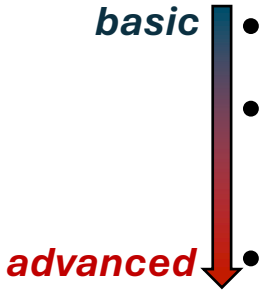






Use AI Tools for Programming Help

- 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