

COMP 5112

Fall, 2024

Data Structures and Database Systems

Connecting Python and Java Programming Environments:

Install IJava to Jupyter notebook

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Important note

- Please note that the interactive notebook only is for your additional learning with the purpose of more efficiently practicing and understanding the codes in the lecture notes.
- For your assignments, please submit *.java files (Do **not** submit any *.ipynb files)

Set up Python and Java SE programming Environments (Window)

1. Install Python
2. Install Jupyter notebook
3. Install java SE Development Kit 21
4. Install iJava to Jupyter notebook
5. Install the other IDEs'

For example, if you have installed Python and JDK, you only follow Step 4.

If some of programmes are installed in your computer, you may skip the related steps. Please know that executing your current or previous programmes may be impacted if you update the environment.

1. Install Python

<https://www.python.org/downloads/>

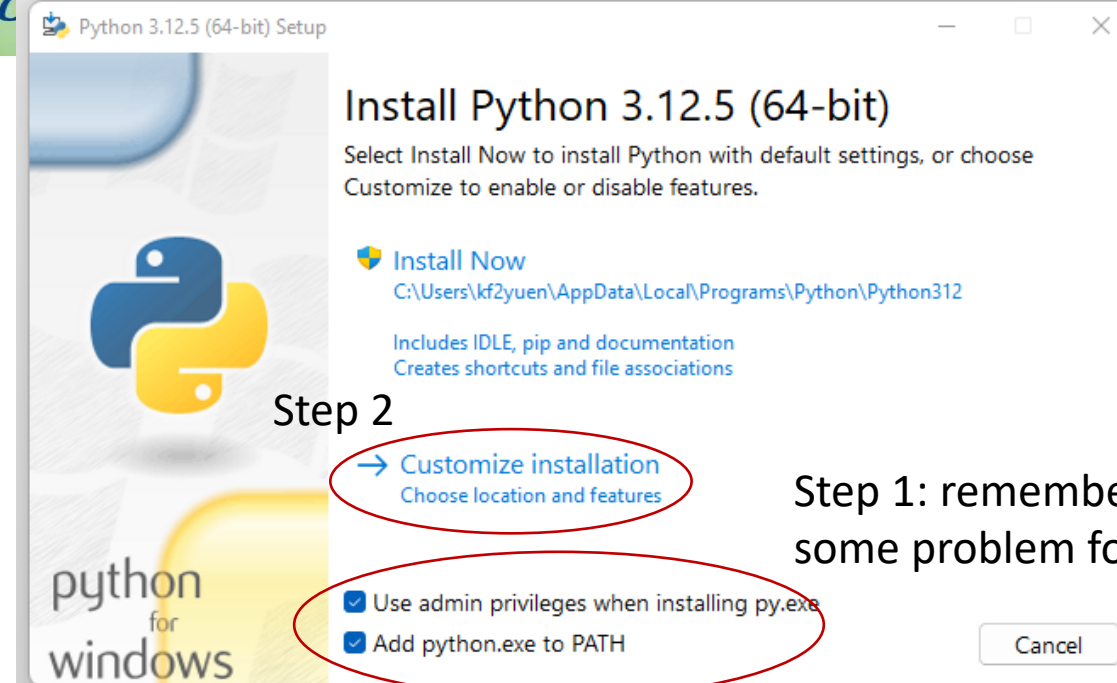
For example, Current version is 3.12.5

<https://www.python.org/downloads/release/python-3125/>

Version	Operating System	Description	MD5 Sum	File Size	GPG	Sigstore	SBOM
Gzipped source tarball	Source release		d23d56b51d36a9d51b2b13d30c849d00	25.7 MB	SIG	.sigstore	SPDX
XZ compressed source tarball	Source release		02c7d269e077f4034963bba6befdc715	19.5 MB	SIG	.sigstore	SPDX
macOS 64-bit universal2 installer	macOS	for macOS 10.9 and later	78bd8d0795062b1df63e2b8d8386a5fa	43.5 MB	SIG	.sigstore	
Windows installer (64-bit)	Windows	Recommended	bbcb2fcf9d739f776fb6414afc12c80d	25.3 MB	SIG	.sigstore	SPDX
Windows installer (32-bit)	Windows		d151f5f116e11c4d40021527f51ddf67	24.0 MB	SIG	.sigstore	SPDX
Windows installer (ARM64)	Windows	Experimental	365d59eff83dfea9af528df4ebd060cb	24.5 MB	SIG	.sigstore	SPDX
Windows embeddable package (64-bit)	Windows		0f53697bdcecfb97b99ac8aa9d9a9e13	10.5 MB	SIG	.sigstore	SPDX
Windows embeddable package (32-bit)	Windows		82dd15b14c307f5fcef80ccb45d6b404	9.4 MB	SIG	.sigstore	SPDX
Windows embeddable package (ARM64)	Windows		62c81364c232644f280b06ef5f33a029	9.8 MB	SIG	.sigstore	SPDX

Choose windows or MacOS

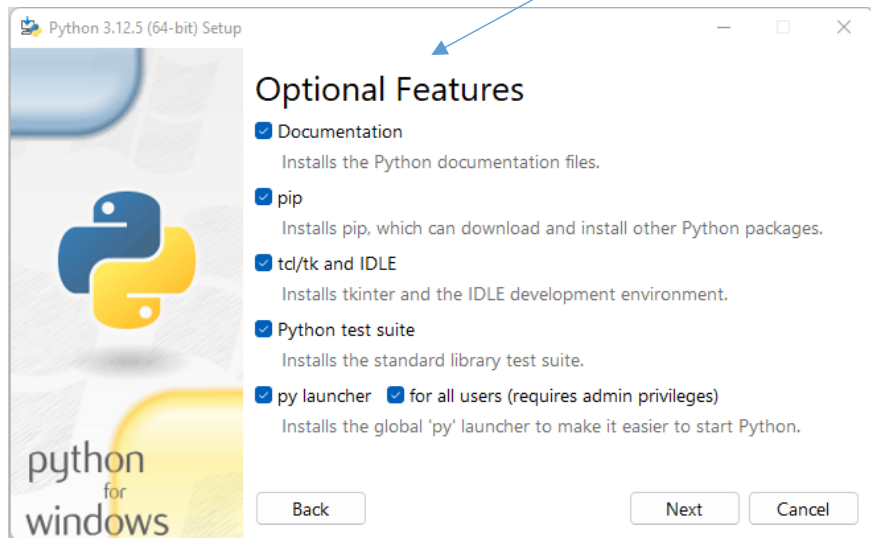
Install Python



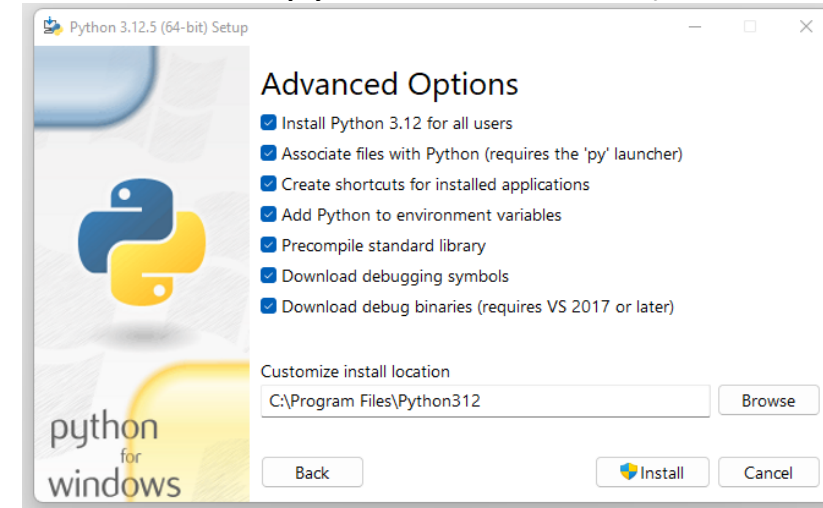
Step 2

Step 1: remember check all. Otherwise, some problem for using python in cmd / terminal.

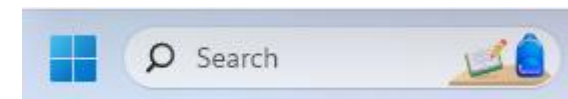
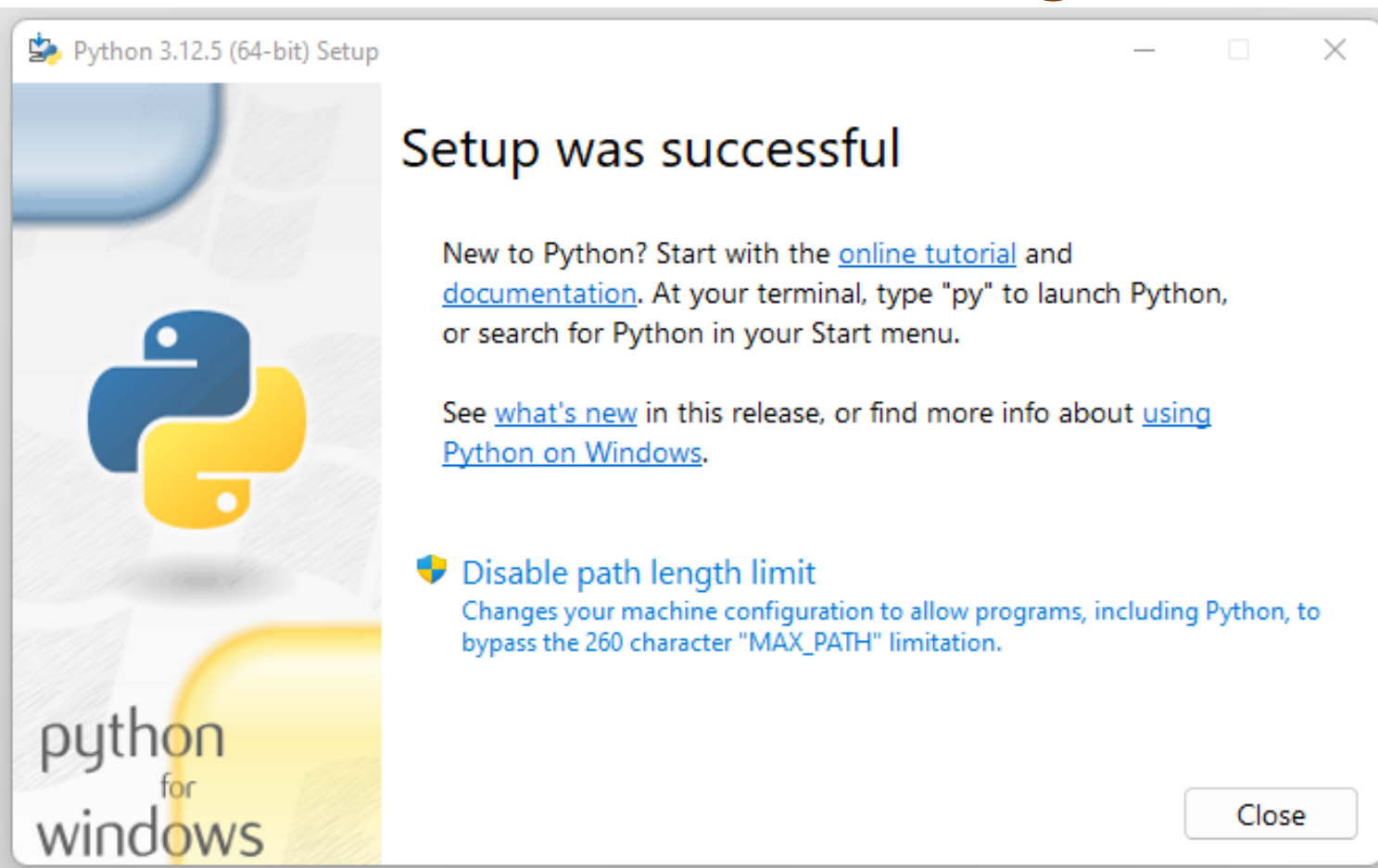
Step 3: Check all



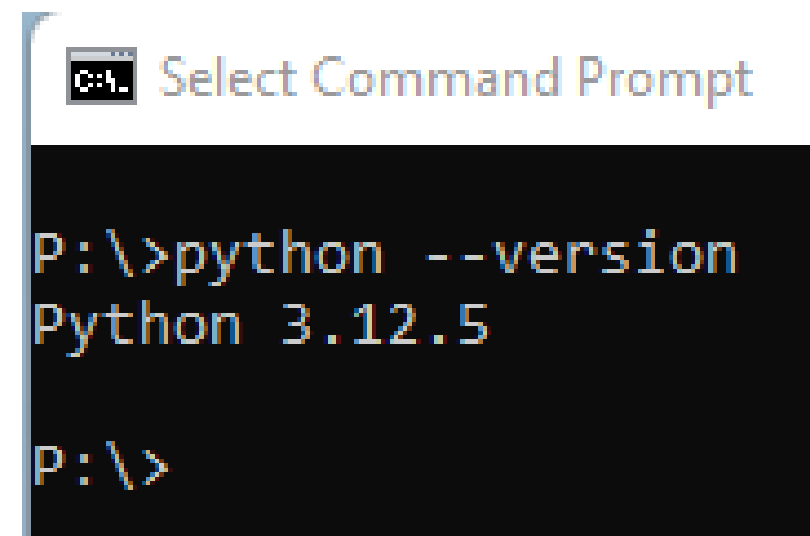
Step 4: Check all, or use default setting (ensure where the python is installed)



Congratulations!



Type cmd (or PowerShell) in “search” for Command Prompt (or PowerShell) .
Verify the python can be used in Command Prompt.



2. Install Jupyter notebook

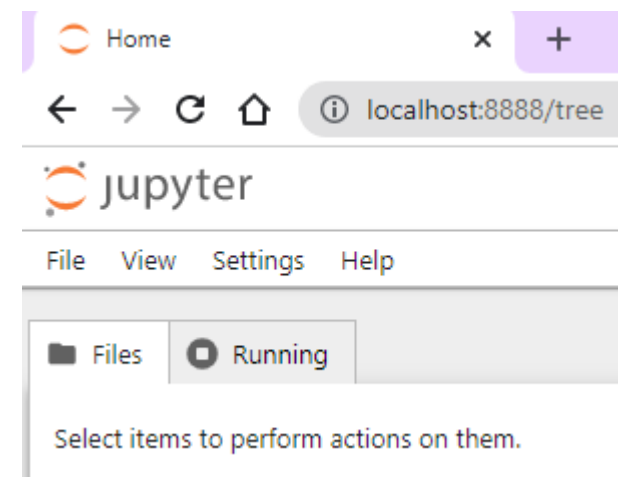
Command Prompt

```
P:\>python --version  
Python 3.12.5  
  
P:\>pip install jupyter
```

After finishing installation, type..

```
P:\>python -m notebook  
[I 2024-09-06 19:15:56.4  
[I 2024-09-06 19:15:56.4  
[I 2024-09-06 19:15:56.4
```

The Jupyter notebook successfully launches.



pip: **P**ackage **I**nstaller for **P**ython

for more information,
> pip help
> pip list

Special issue

```
[I 2024-09-06 20:23:57.774 ServerApp] Jupyter Server 2.14.2 is running at:  
[I 2024-09-06 20:23:57.774 ServerApp] http://localhost:8888/tree?token=a96c7ef9dd7fe61d2dcf2741e2422ca2f6bcd620a19ae42c  
[I 2024-09-06 20:23:57.774 ServerApp] http://127.0.0.1:8888/tree?token=a96c7ef9dd7fe61d2dcf2741e2422ca2f6bcd620a19ae42c
```

- If your browser cannot launch Jupyter notebook, or you carelessly close the web, find and Copy the address in command prompt.
- Paste the http address to your web browser to launch the Jupyter notebook.

Close the Jupyter notebook to Prepare to install JDK

Close your Command Prompt (or PowerShell terminal)



Close a web page of the Jupyter notebook as well

3. Install JDK

- Download Java SE Development Kit 21
<https://www.oracle.com/java/technologies/downloads/#jdk21-windows>
- JDK 22 is Not recommended because it is NOT under LTS.

Java downloads Tools and resources Java archive

JDK 22 **JDK 21** JDK 17 GraalVM for JDK 22 GraalVM for JDK 21 GraalVM for JDK 17

JDK Development Kit 21.0.4 downloads

JDK 21 binaries are free to use in production and free to redistribute, at no cost, under the [Oracle No-Fee Terms and Conditions \(NFTC\)](#).

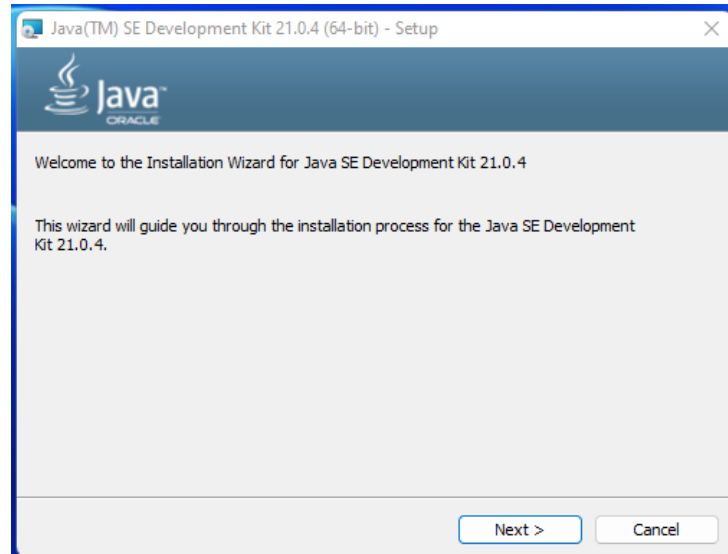
JDK 21 will receive updates under the NFTC, until September 2026, a year after the release of the next LTS. Subsequent JDK 21 updates will be licensed under the [Java SE OTN License \(OTN\)](#) and production use beyond the [limited free grants](#) of the OTN license will [require a fee](#).

Linux macOS **Windows**

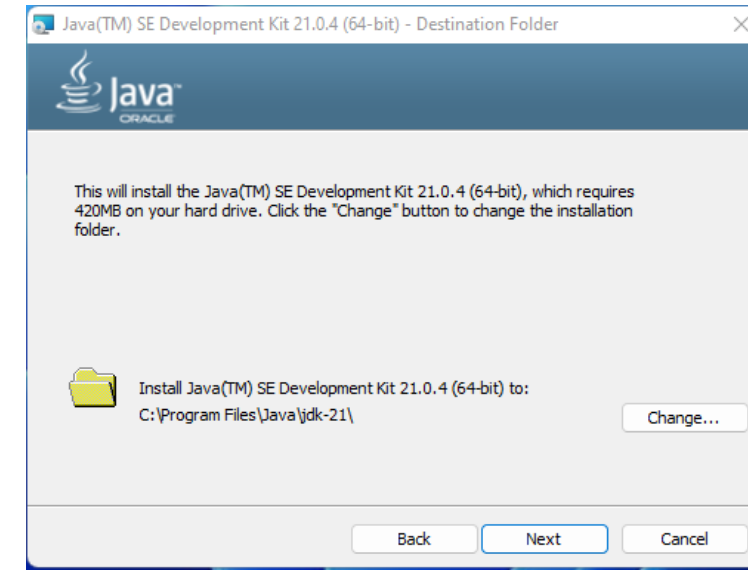
Product/file description	File size	Download
x64 Compressed Archive	185.84 MB	https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.zip (sha256)
x64 Installer	164.23 MB	https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.exe (sha256)
x64 MSI Installer	162.97 MB	https://download.oracle.com/java/21/latest/jdk-21_windows-x64_bin.msi (sha256)

- Click the JDK file downloaded and install by default settings as below.

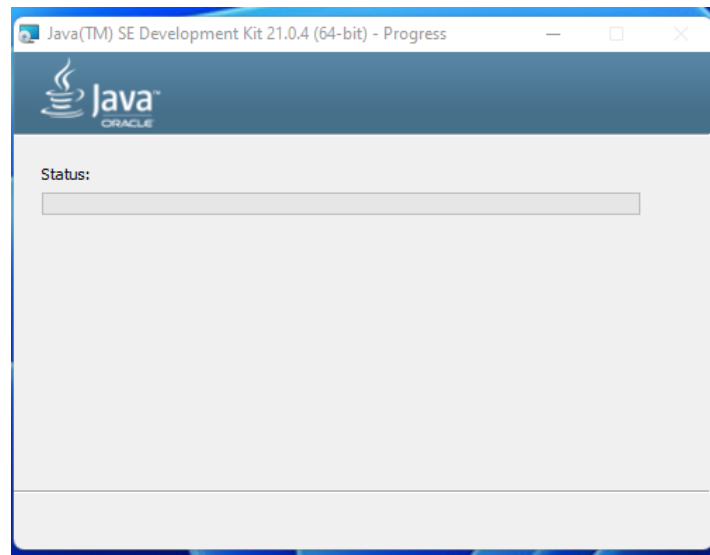
Step 1



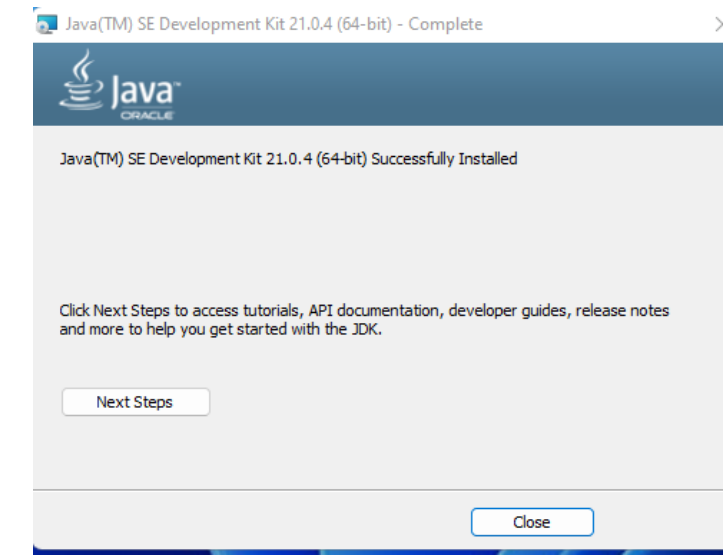
Step 2



Step 3



Step 4



Congratulations!

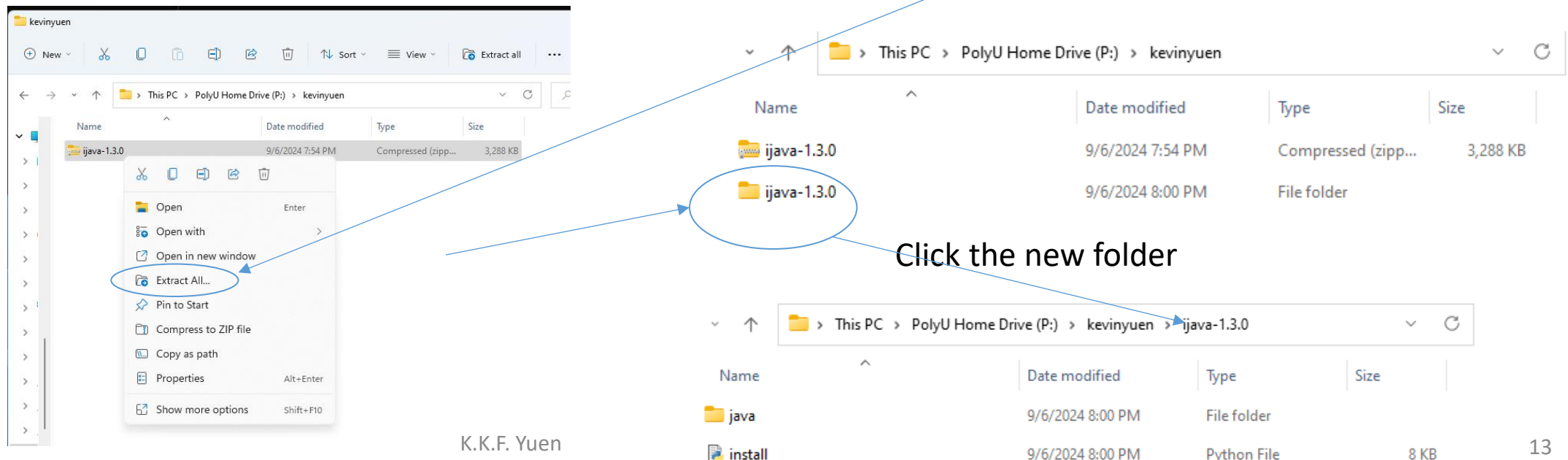
- Type **cmd** in “search” bar to launch Command Prompt.
- Type the command as below.

 Command Prompt

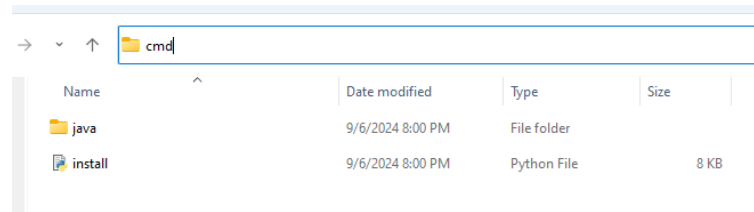
```
P:\>java -version
java version "21.0.4" 2024-07-16 LTS
Java(TM) SE Runtime Environment (build 21.0.4+8-LTS-274)
Java HotSpot(TM) 64-Bit Server VM (build 21.0.4+8-LTS-274, mixed mode, sharing)
```

4. Install IJava into notebook

- Download the zip file to your preferred location:
<https://github.com/SpencerPark/IJava/releases/download/v1.3.0/ijava-1.3.0.zip>
- Right click the zip file downloaded and click **Extract All**.



- Under the bar of the new folder, type “cmd” to show the command prompt with current location.



- Type the command below under the directory to install IJava.

```
C:\Windows\System32\cmd.exe  
  
P:\kevinyuen\ijava-1.3.0>python install.py
```

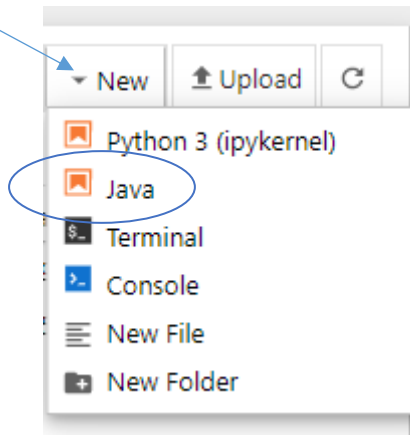
- After the program is installed, you can see the message where the Java kernel in Jupyter is.

```
Installed java kernel into "C:\ProgramData\jupyter\kernels\java"
```

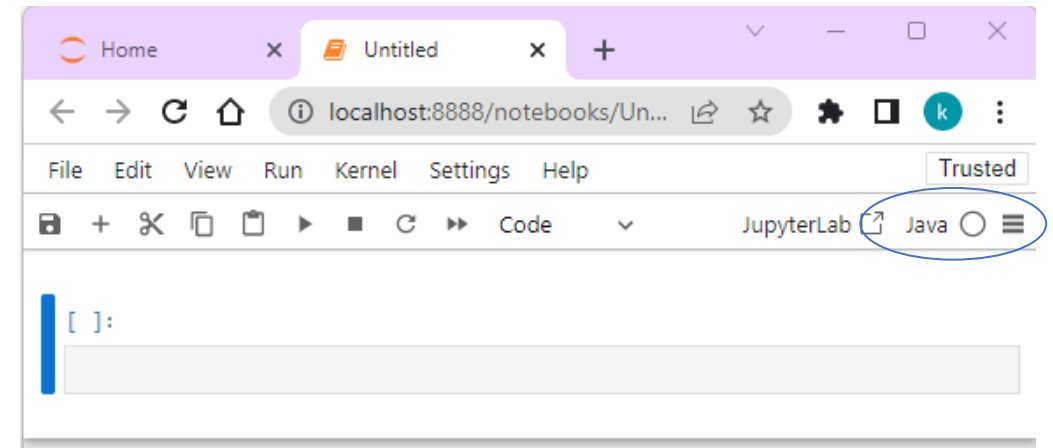
1. Launch Jupyter notebook

```
P:\kevinyuen>python -m notebook  
[I 2024-09-06 20:23:57.029 Server  
[I 2024-09-06 20:23:57.029 Server
```

2. Under “New”, click the Java kernel



3. You will see a Java Notebook created.



Congratulations!

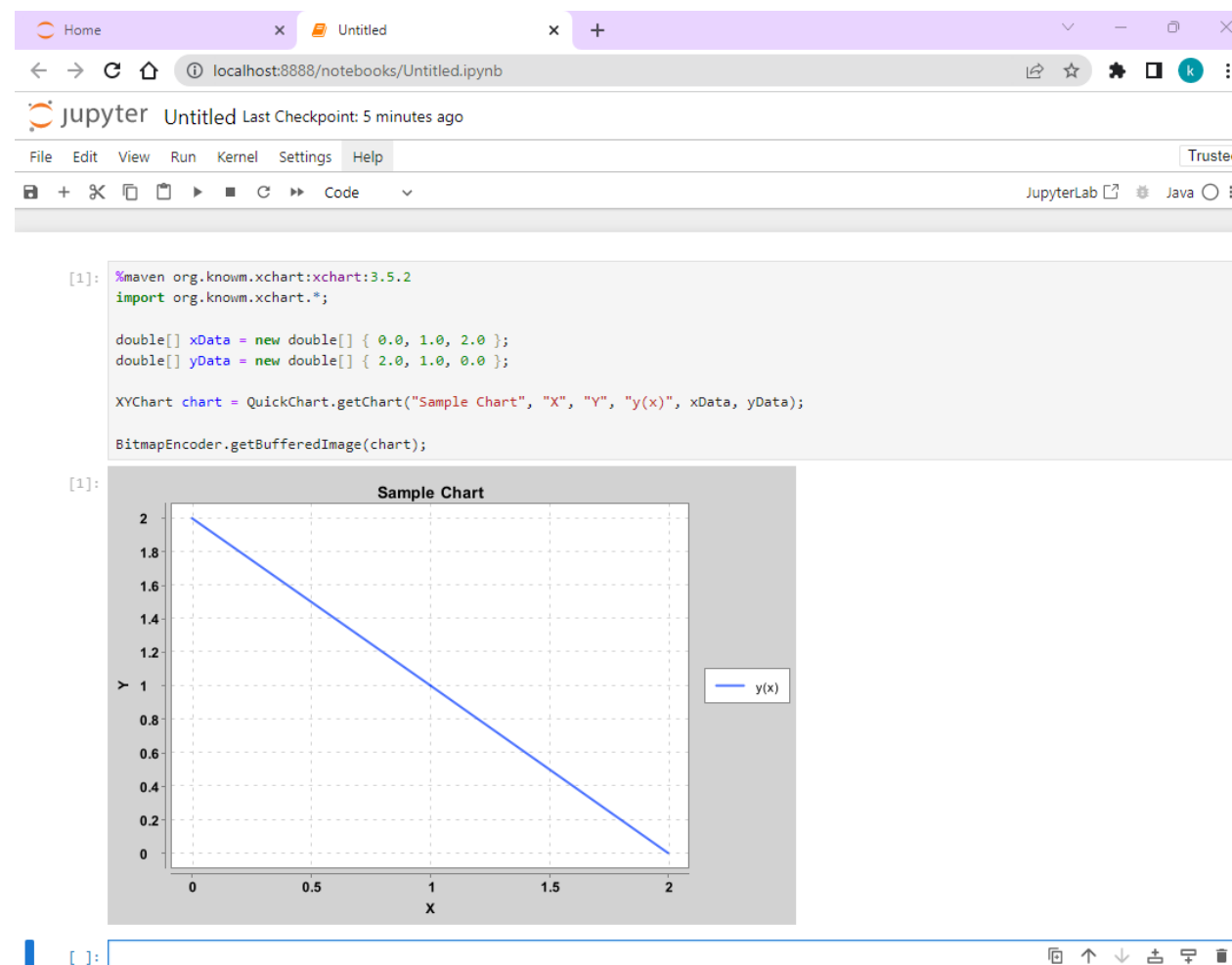
Try the code below to and run on the Java Notebook page.

```
%maven org.knowm.xchart:xchart:3.5.2
import org.knowm.xchart.*;

double[] xData = new double[] { 0.0, 1.0, 2.0 };
double[] yData = new double[] { 2.0, 1.0, 0.0 };

XYChart chart = QuickChart.getChart("Sample
Chart", "X", "Y", "y(x)", xData, yData);

BitmapEncoder.getBufferedImage(chart);
```



5. Free IDE's for Java Coding

- IntelliJ IDEA Community Edition
<https://www.jetbrains.com/idea/download/other.html>
- Visual Studio Code
<https://code.visualstudio.com/>
- Apache NetBeans
<https://netbeans.apache.org/front/main/index.html>
- Eclipse
<https://www.eclipse.org/downloads/>