

Future Vehicle Education Workshop

**Subject:
Environment Setting**

Automation Lab.



PC

■ PC Hardware Environment



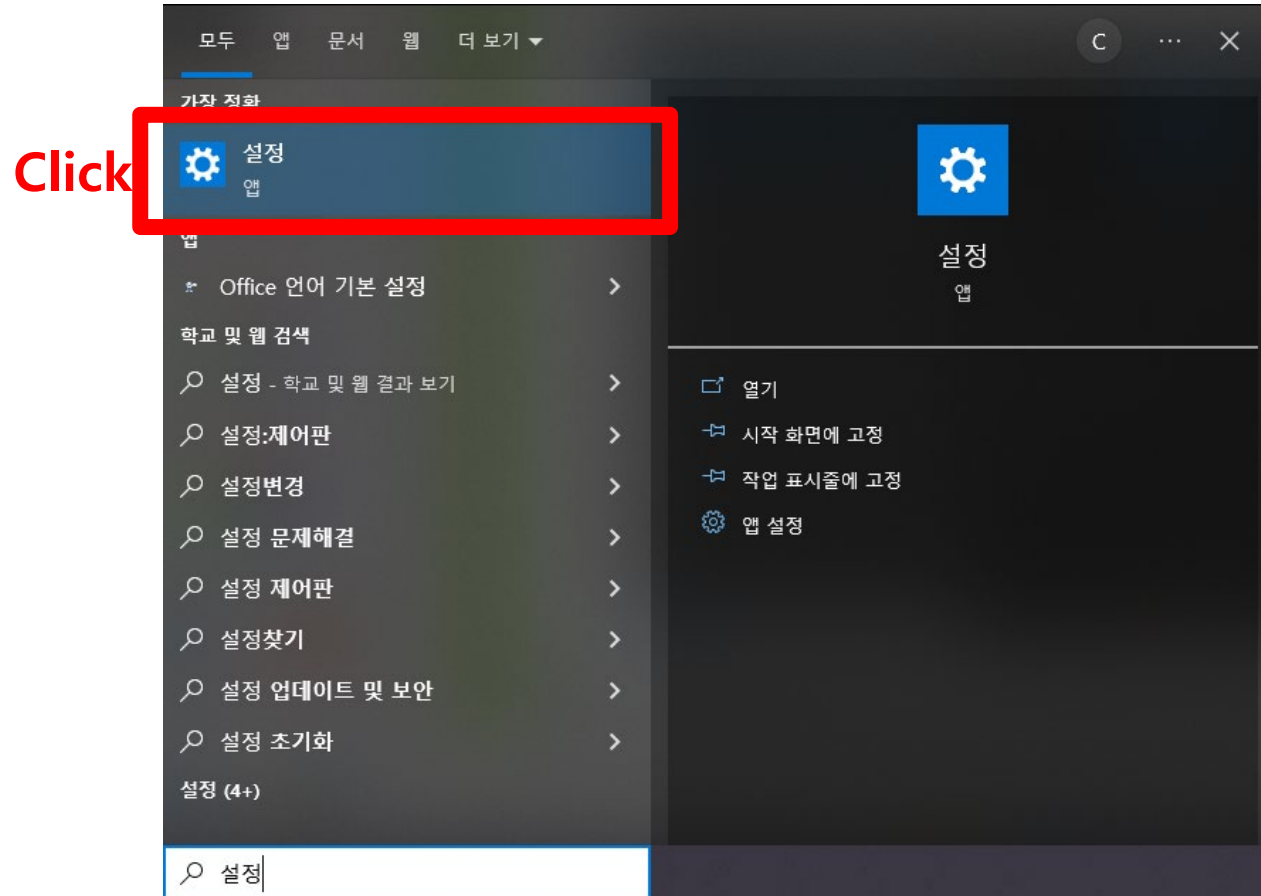
Operating System: Window10



Architecture: x86, x64

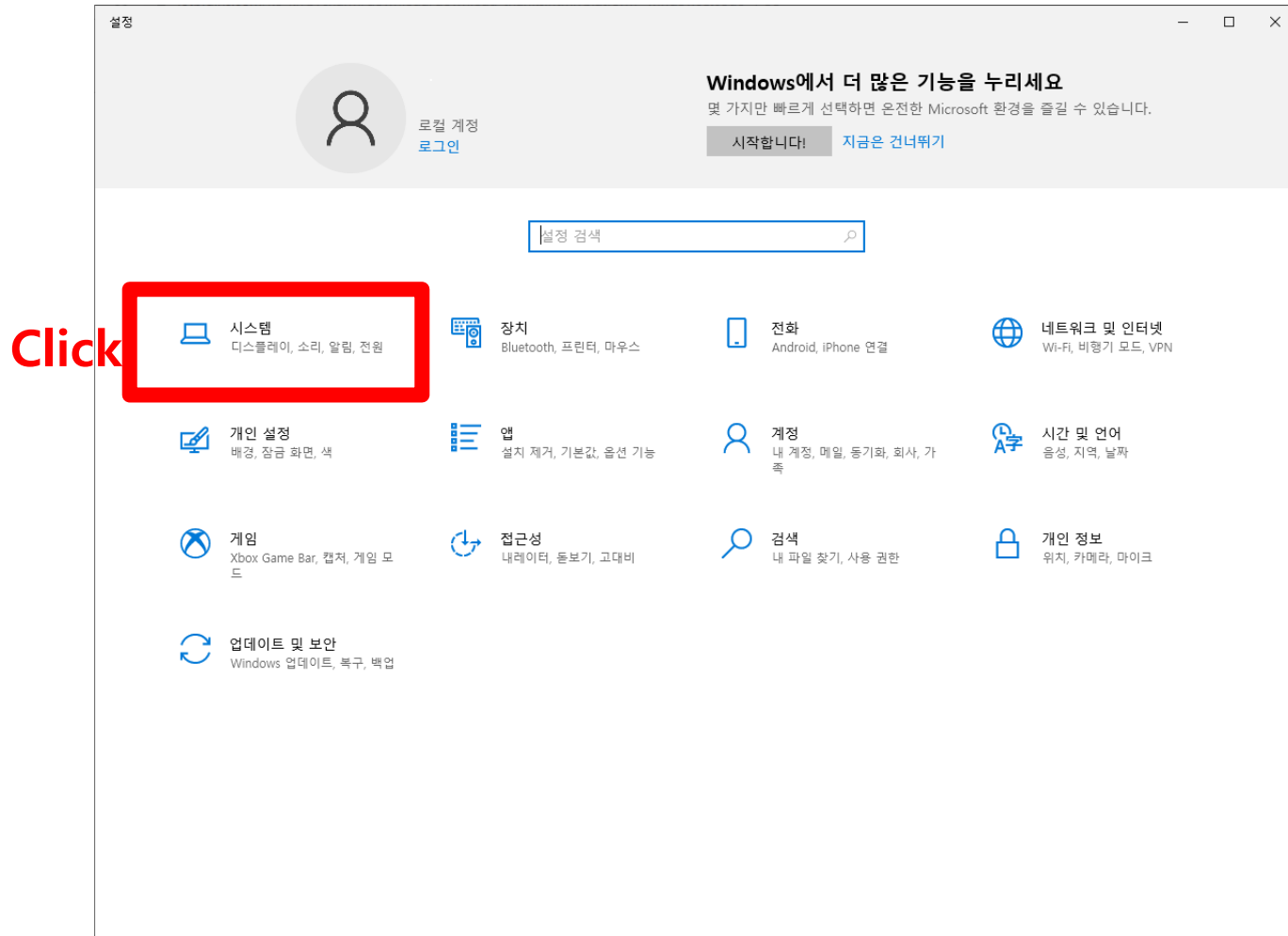
PC

■ Check your PC's hardware specifications



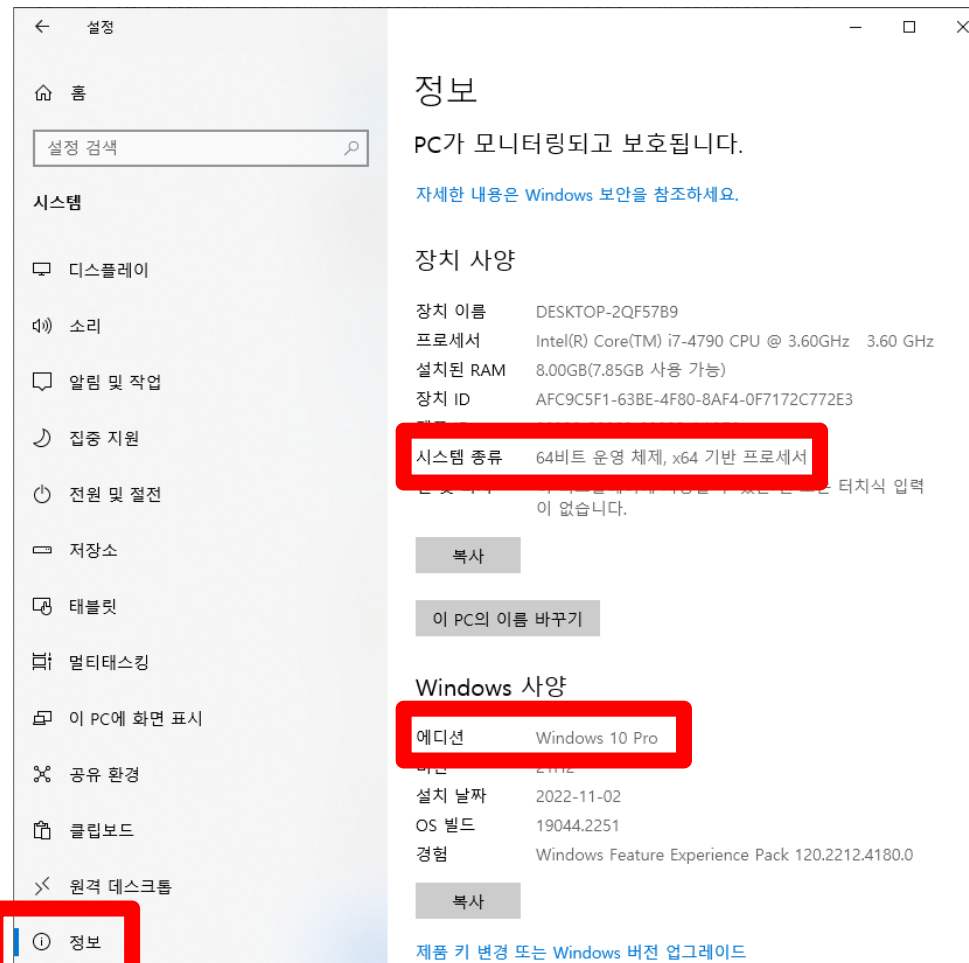
PC

■ Check your PC's hardware specifications



PC

■ Check your PC's hardware specifications



Click

① 정보

LiDAR

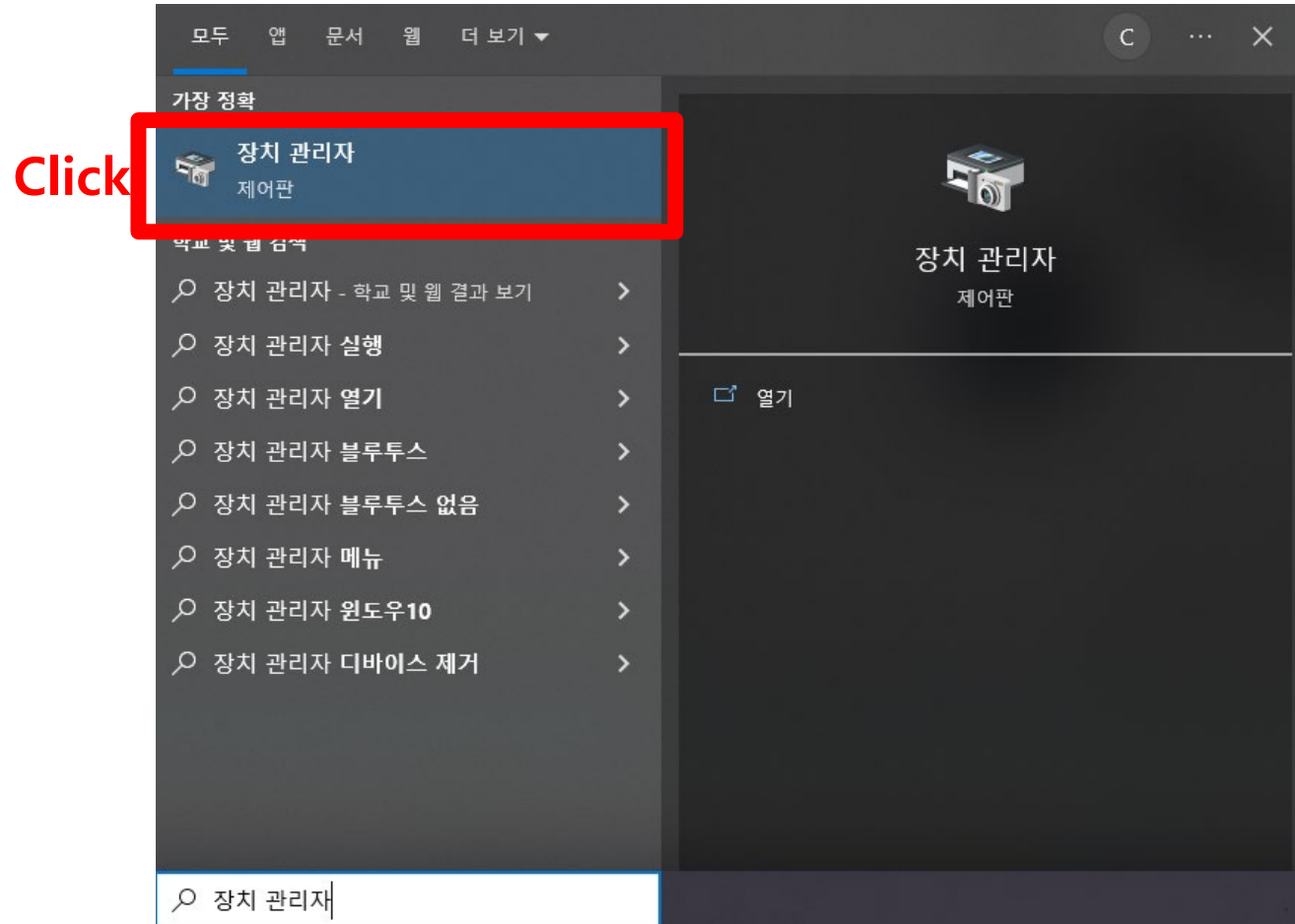
■ LiDAR



**Connect the short wire
to the PC**

LiDAR

■ Verify Lidar Device Connection



LiDAR

■ Verify Lidar Device Connection



Other Device CP2102 USB Recognition Checks

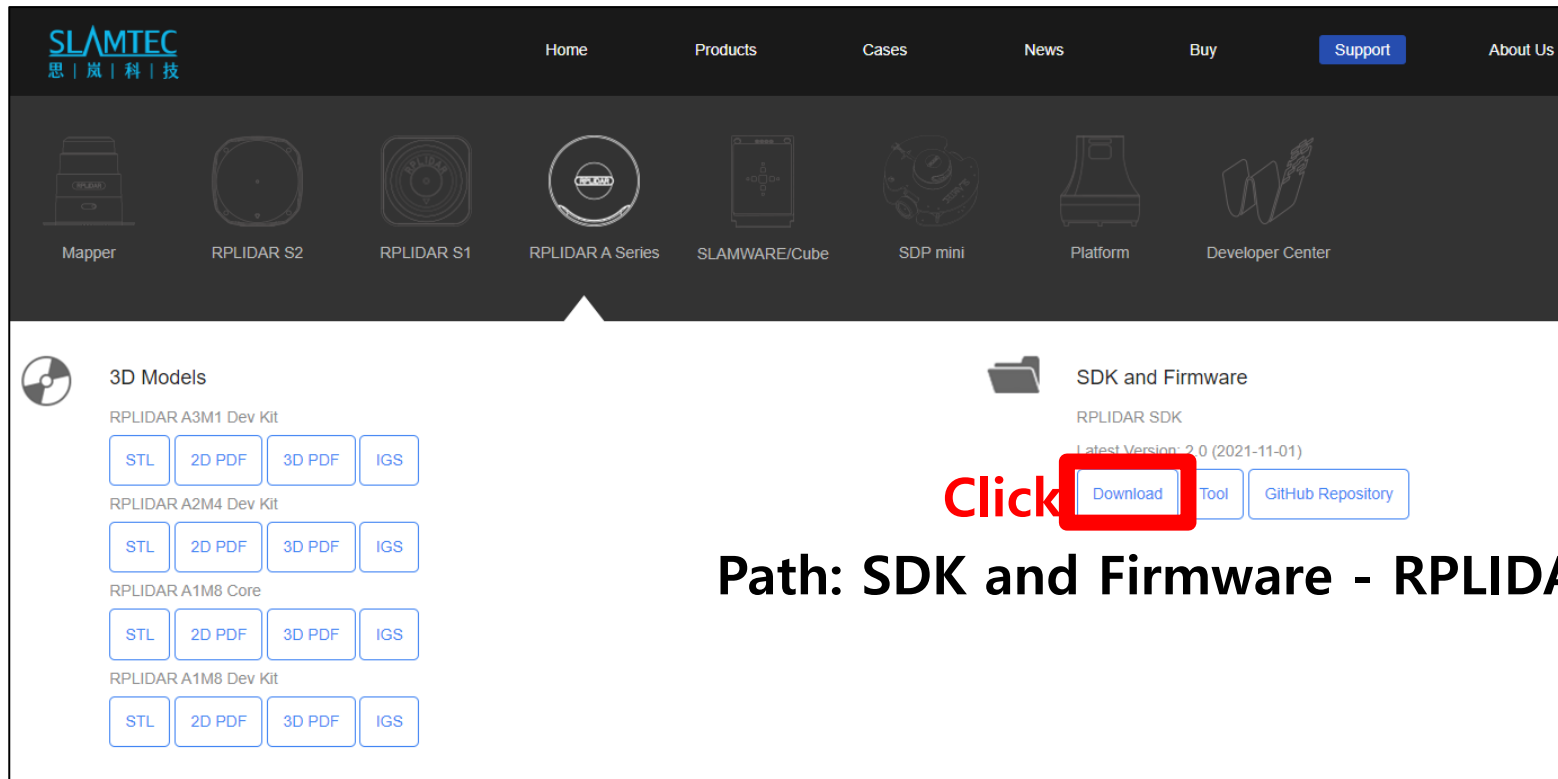
If not recognized, check the lidar USB port connection

LiDAR

■ Install LiDAR Driver

Download page:

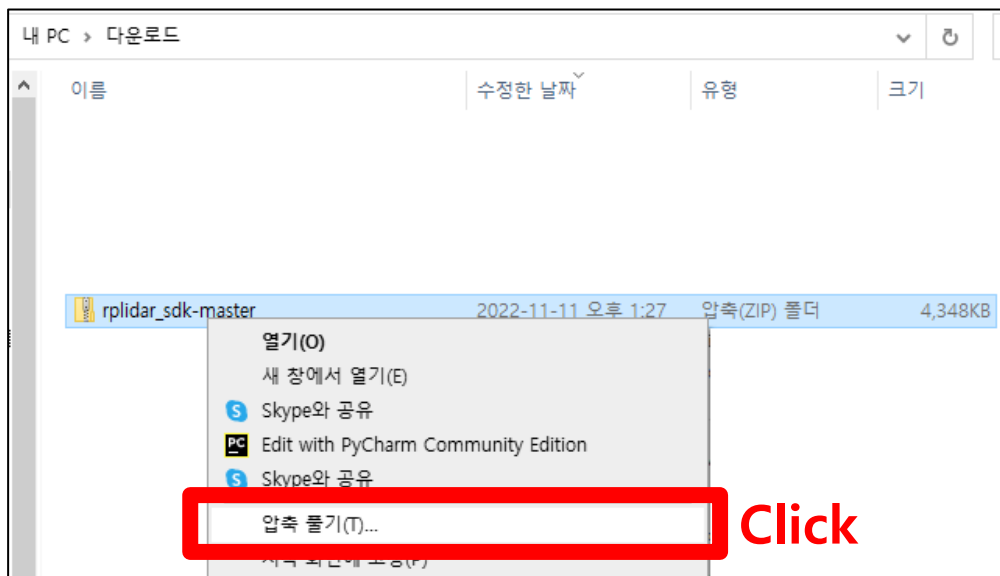
<https://www.slamtec.com/en/support#rplidar-a-series>



Path: SDK and Firmware - RPLIDAR SDK - Download

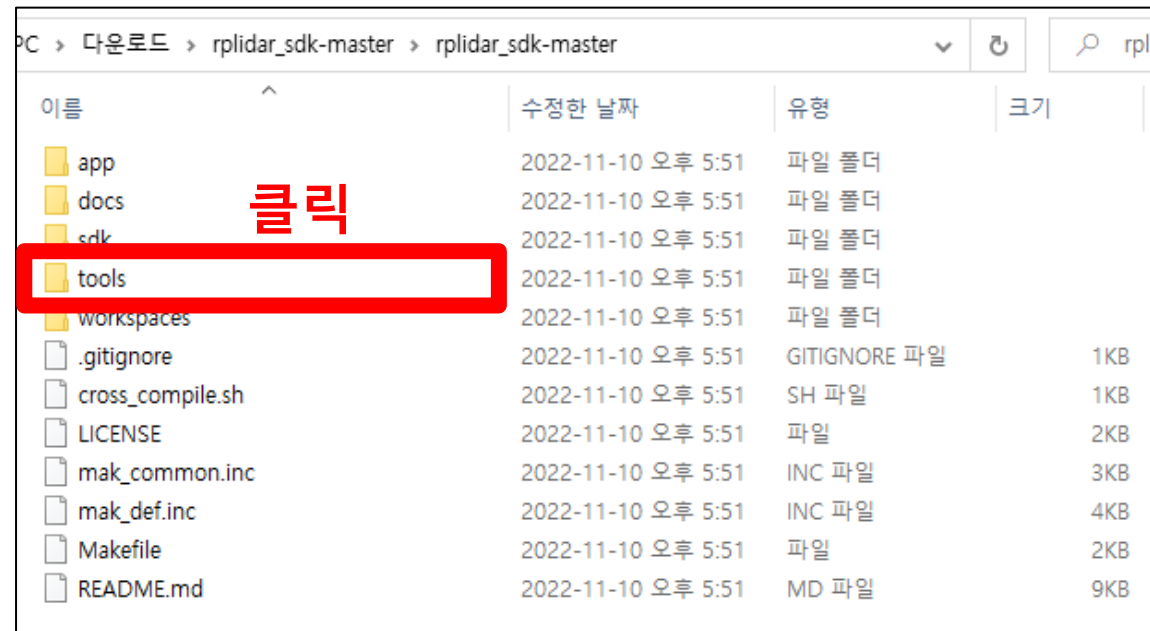
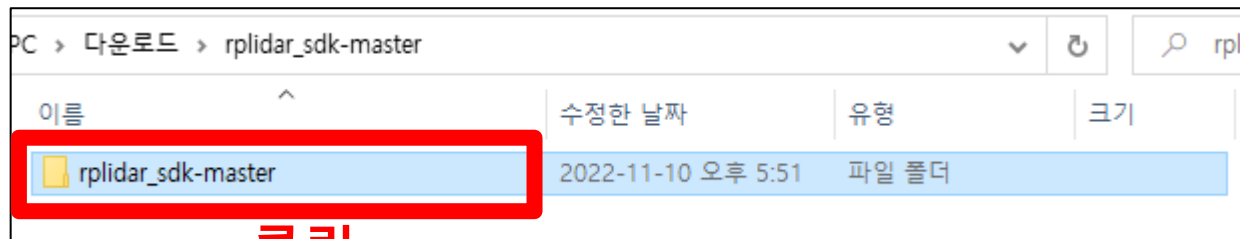
LiDAR

■ Install LiDAR Driver



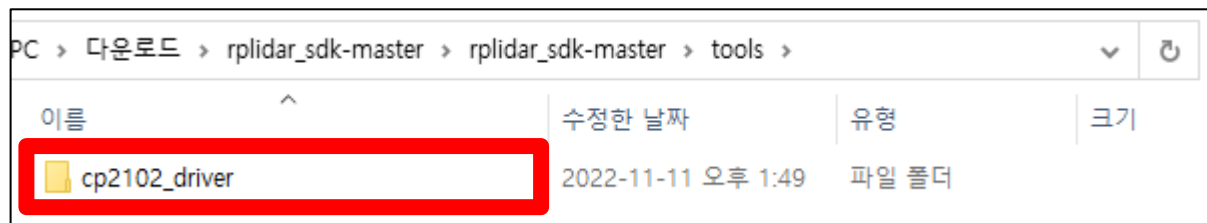
LiDAR

■ Install LiDAR Driver

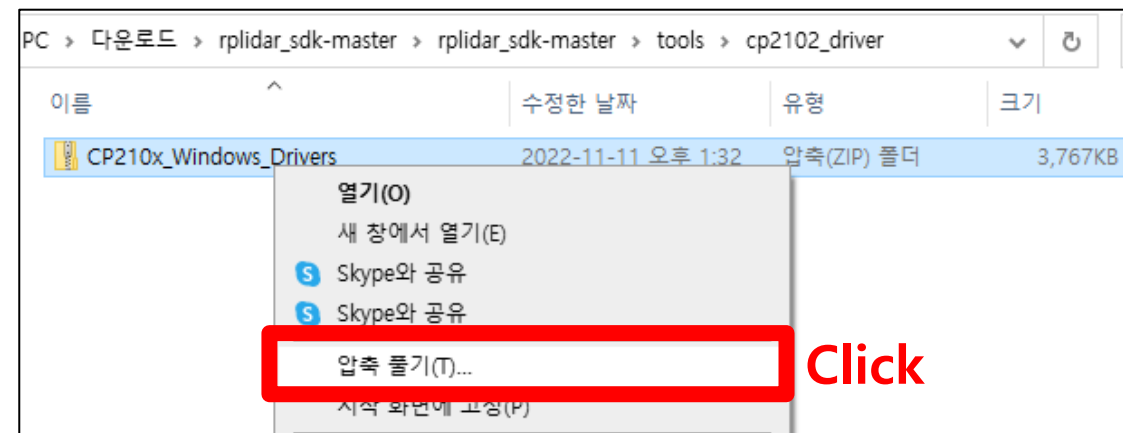


LiDAR

■ Install LiDAR Driver



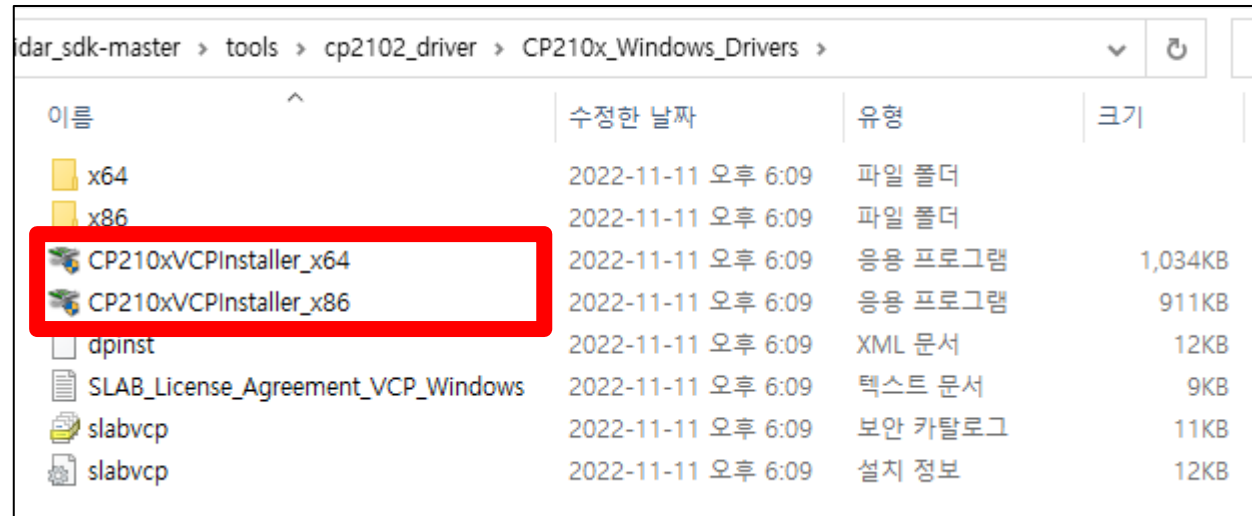
Click



Click

LiDAR

■ Install LiDAR Driver

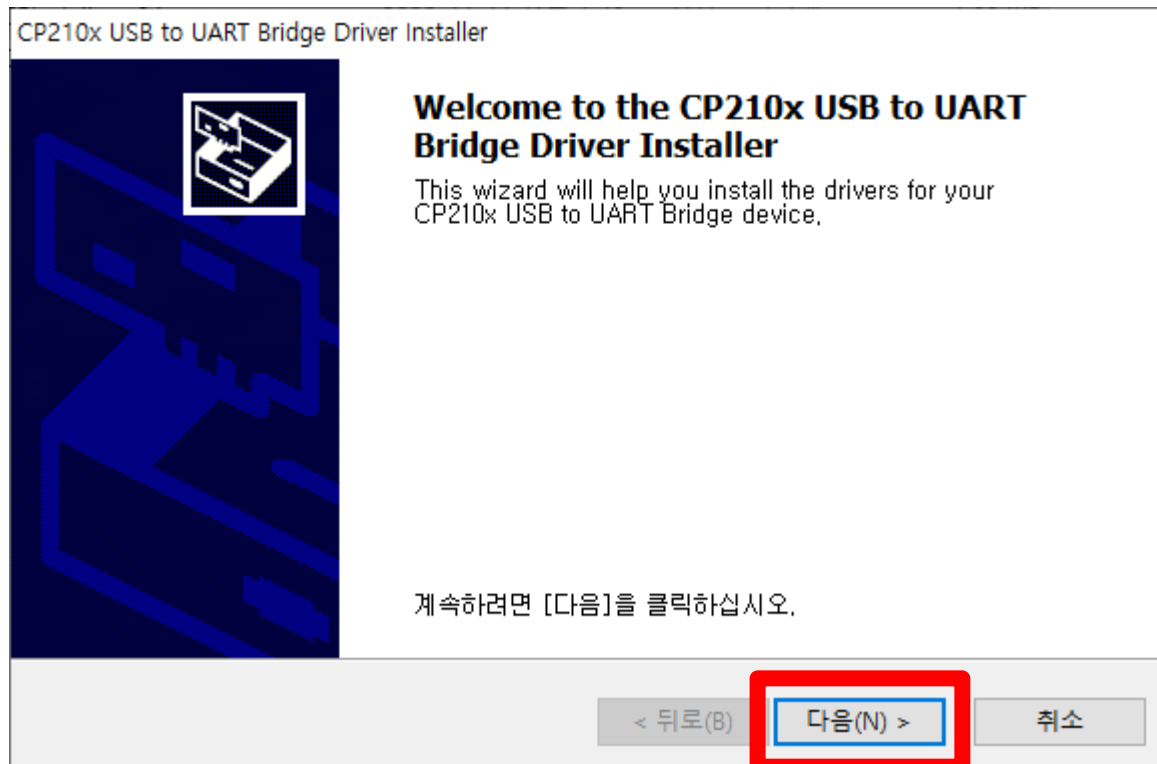


| 이름 | 수정한 날짜 | 유형 | 크기 |
|------------------------------------|--------------------|---------|---------|
| x64 | 2022-11-11 오후 6:09 | 파일 폴더 | |
| x86 | 2022-11-11 오후 6:09 | 파일 폴더 | |
| CP210xVCPInstaller_x64 | 2022-11-11 오후 6:09 | 응용 프로그램 | 1,034KB |
| CP210xVCPInstaller_x86 | 2022-11-11 오후 6:09 | 응용 프로그램 | 911KB |
| dpinst | 2022-11-11 오후 6:09 | XML 문서 | 12KB |
| SLAB_License_Agreement_VCP_Windows | 2022-11-11 오후 6:09 | 텍스트 문서 | 9KB |
| slabvcp | 2022-11-11 오후 6:09 | 보안 카탈로그 | 11KB |
| slabvcp | 2022-11-11 오후 6:09 | 설치 정보 | 12KB |

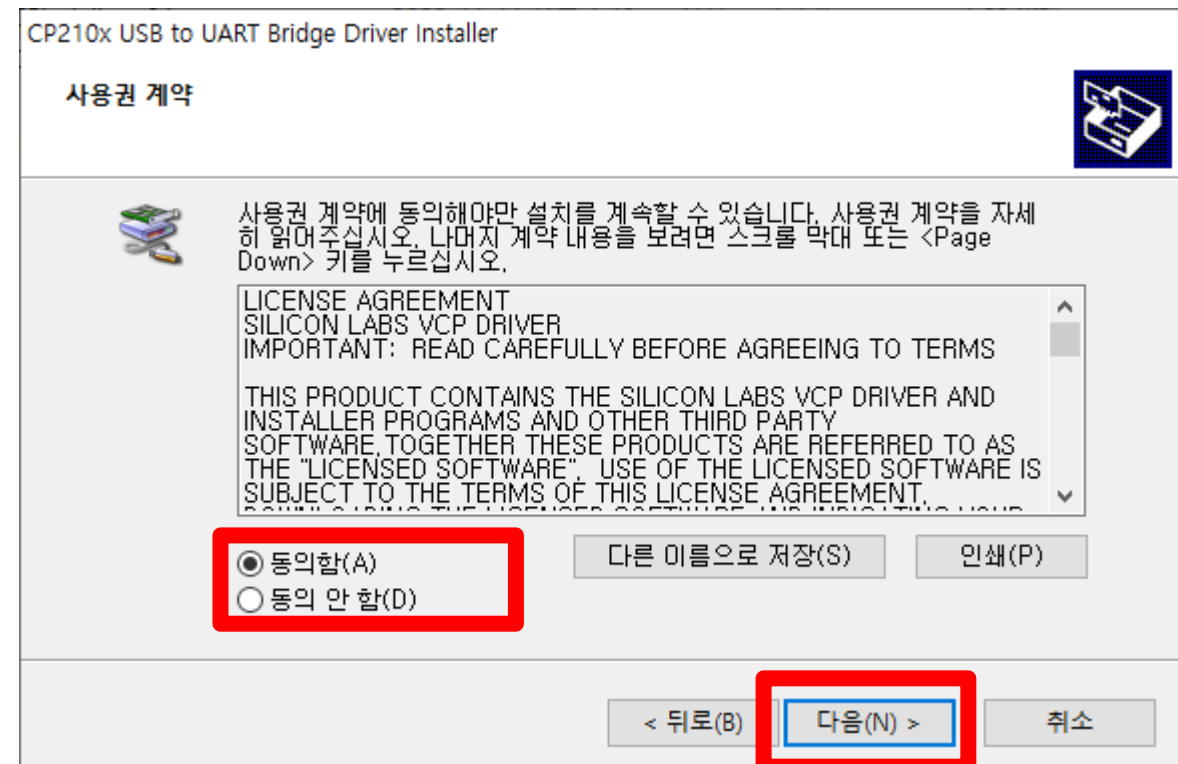
Run programs that meet your PC's specifications

LiDAR

■ Install LiDAR Driver



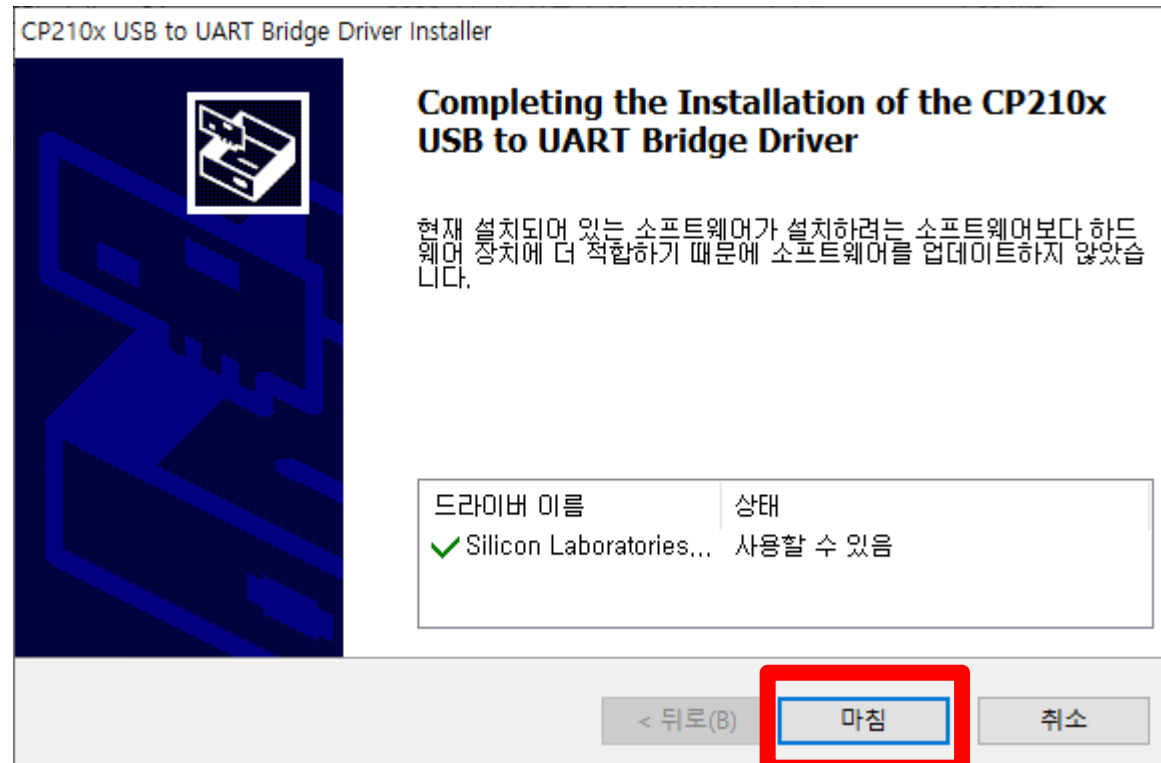
Click



Check Agree, then click Next

LiDAR

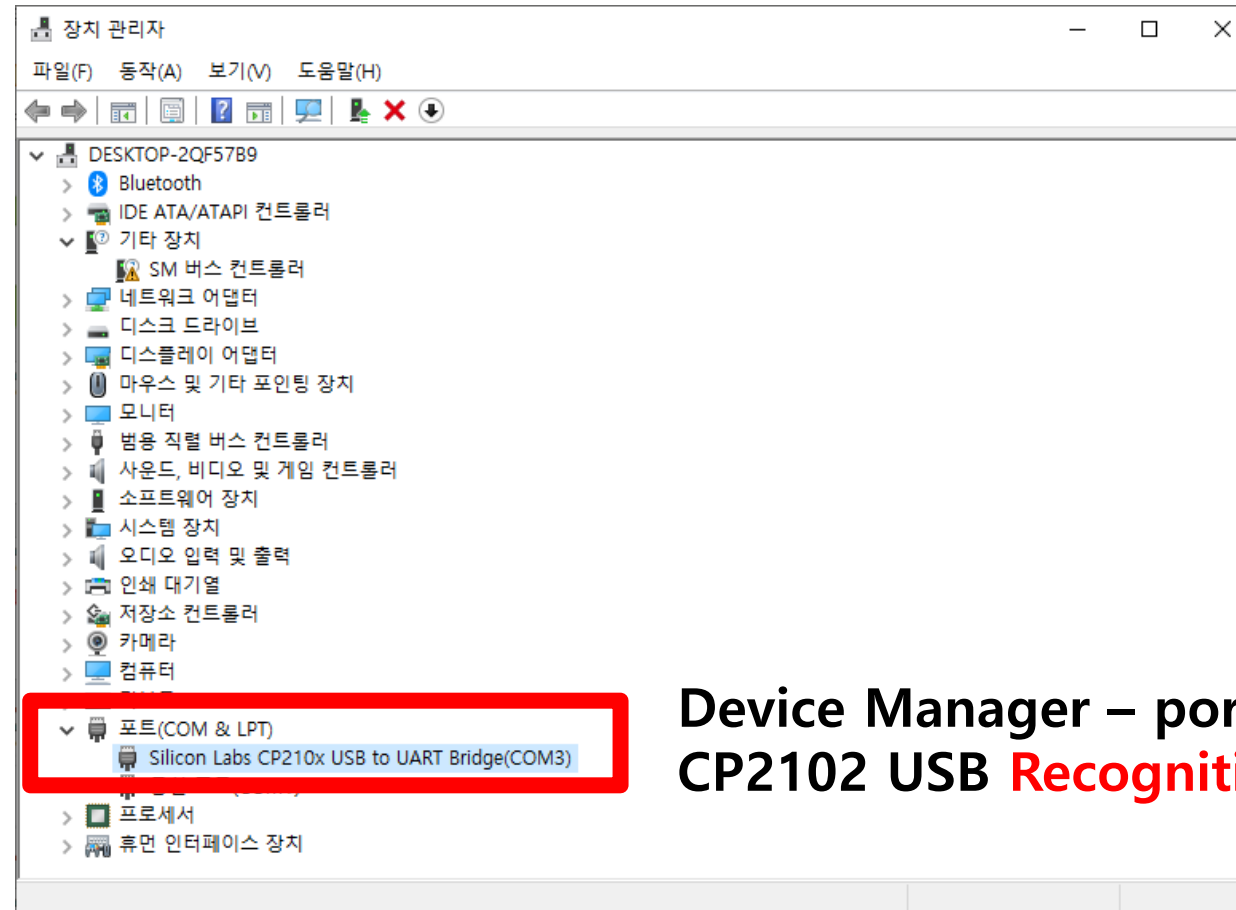
■ Install LiDAR Driver



Click

LiDAR

■ Install LiDAR Driver



Device Manager – port(COM & LPT)
CP2102 USB Recognition check

Arduino IDE

■ Install Arduino IDE

Download page:

<https://www.arduino.cc/en/software>

Arduino IDE 1.8.19
Version check

Legacy IDE (1.8.X)

 **Arduino IDE 1.8.19**

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the [Getting Started](#) page for Installation instructions.

SOURCE CODE

Active development of the Arduino software is [hosted by GitHub](#). See the instructions for [building the code](#). Latest release source code archives are available [here](#). The archives are PGP-signed so they can be verified using [this](#) gpg key.

DOWNLOAD OPTIONS

Windows Win 7 and newer [Get](#)

Windows app Win 8.1 or 10 [Get](#)

Linux 32 bits
Linux 64 bits
Linux ARM 32 bits
Linux ARM 64 bits

Mac OS X 10.10 or newer

[Release Notes](#)

[Checksums \(sha512\)](#)

Previous Releases

Download the previous version of the current release, the classic 1.0.x, or old beta releases.

DOWNLOAD OPTIONS

[Previous Release 1.8.18](#)
[Arduino 1.0.x](#)
[Arduino 1.5.x beta](#)

Click and Download

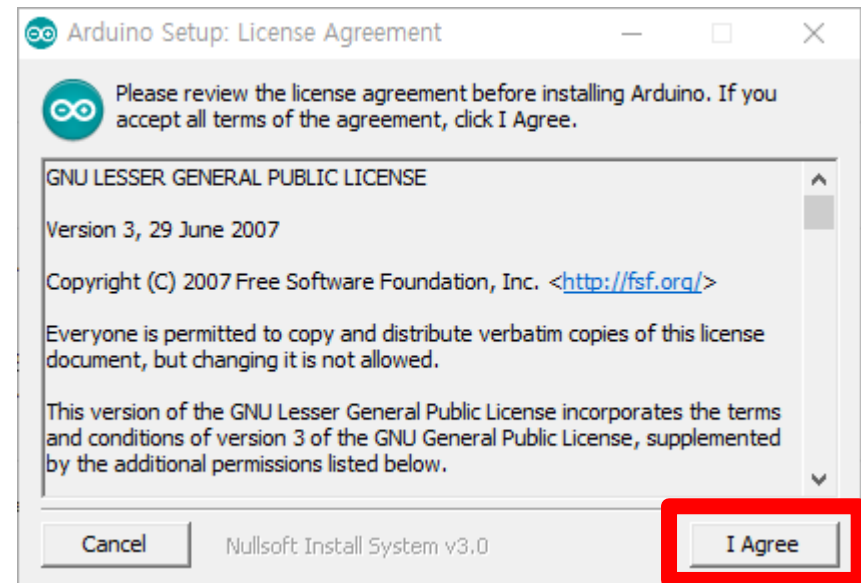
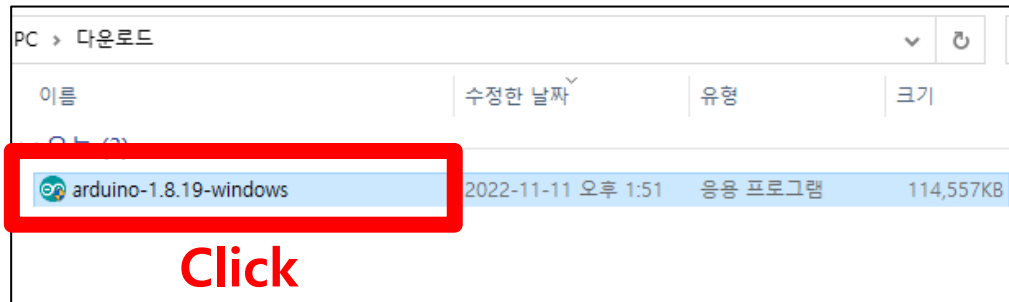
Arduino IDE

■ Install Arduino IDE



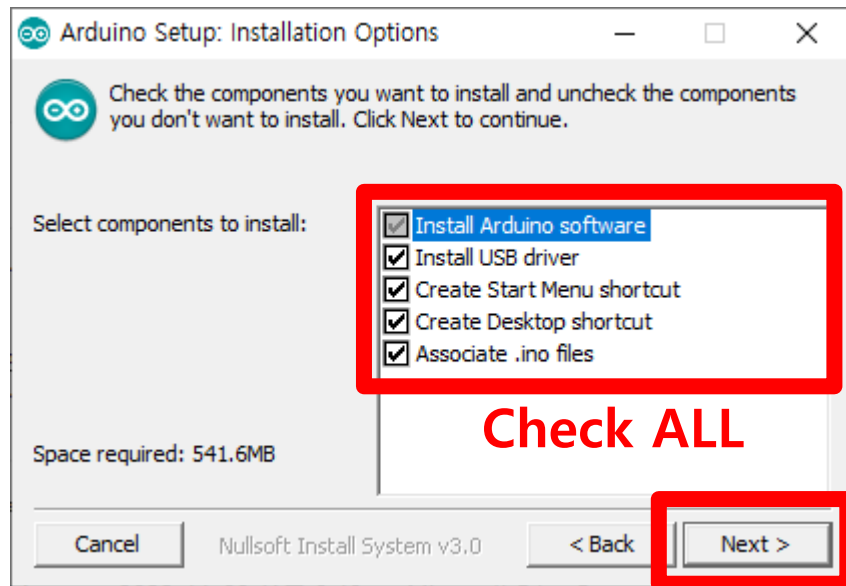
Arduino IDE

■ Install Arduino IDE

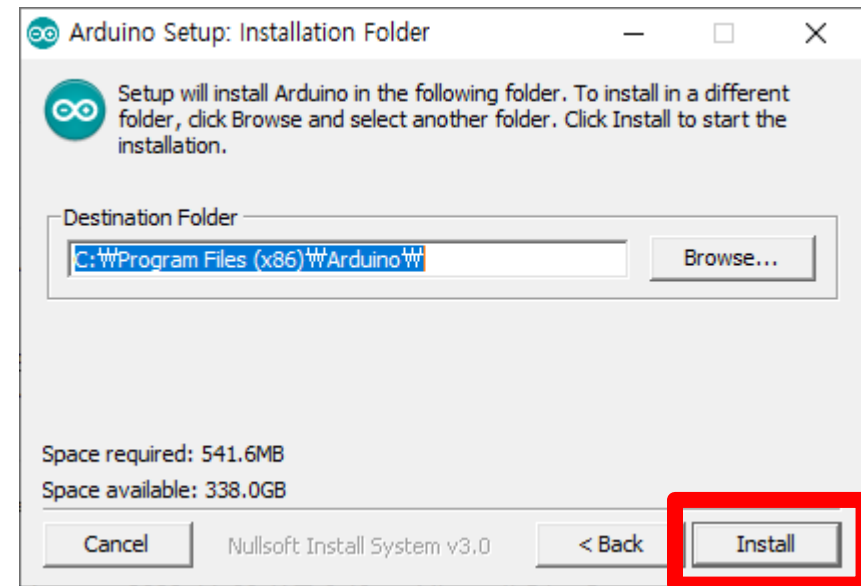


Arduino IDE

■ Install Arduino IDE



Click

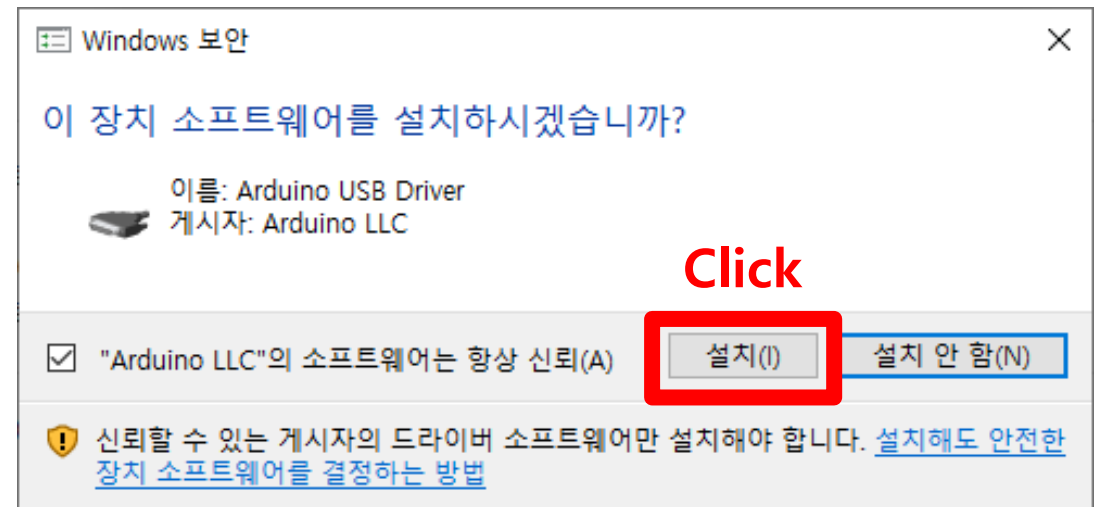


Click

Arduino IDE

■ Install Arduino IDE

Device Software Installation Notification Appearing, Install All



Arduino IDE

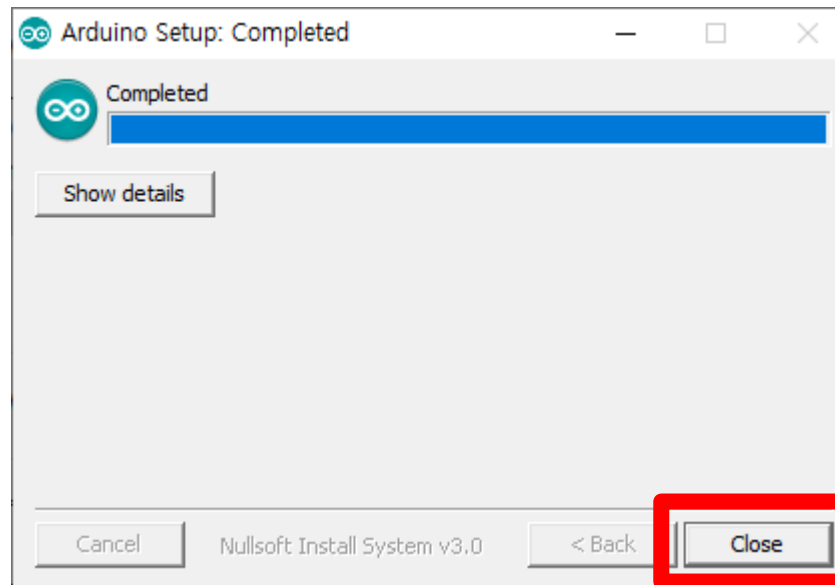
■ Install Arduino IDE

Device Software Installation Notification Appearing, Install All



Arduino IDE

■ Install Arduino IDE

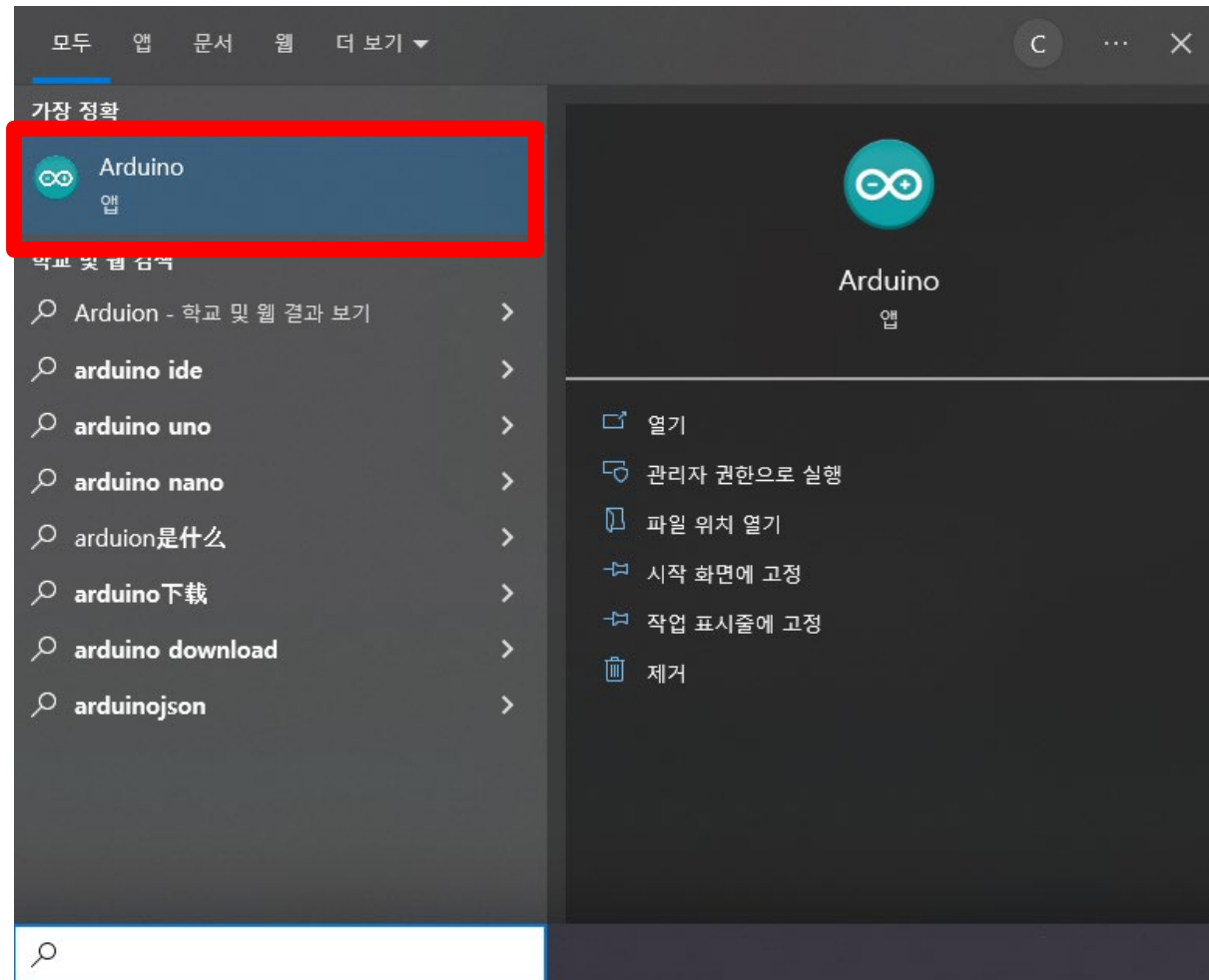


Click

Arduino IDE

■ Install Arduino IDE

Run Arduino



Arduino IDE

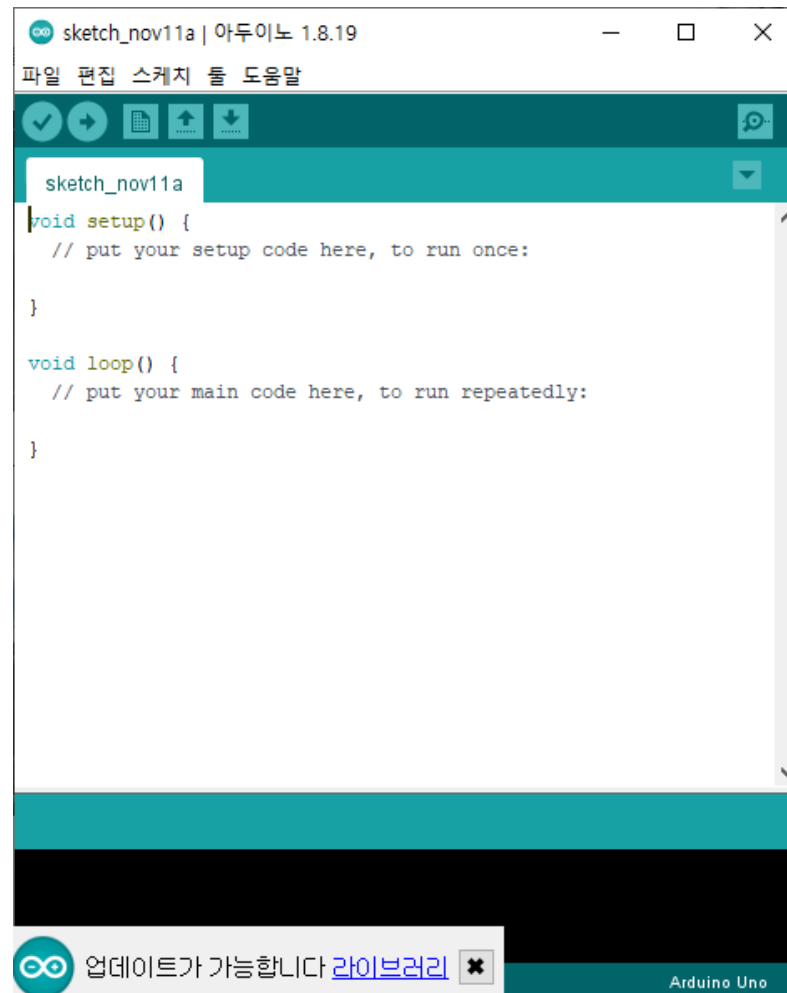
■ Install Arduino IDE



Private Network Check

Arduino IDE

■ Arduino IDE Initial screen



Python

■ Install Python

Download Page:

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

Choose version
and download

python™

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Download the latest version for Windows

Download Python 3.11.0

Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [macOS](#), [Other](#)

Want to help test development versions of Python? [Prereleases](#), [Docker Images](#)

Support Python In 2022! Check out the special deal open only till November 22nd. [Join In today!](#)

Active Python Releases

For more information visit the [Python Developer's Guide](#).

| Python version | Maintenance status | First released | End of support | Release schedule |
|----------------|--------------------|----------------|----------------|------------------|
| 3.11 | bugfix | 2022-10-24 | 2027-10 | PEP 664 |
| 3.10 | bugfix | 2021-10-04 | 2026-10 | PEP 619 |
| 3.9 | security | 2020-10-05 | 2025-10 | PEP 596 |
| 3.8 | security | 2019-10-14 | 2024-10 | PEP 569 |
| 3.7 | security | 2018-06-27 | 2023-06-27 | PEP 537 |

Looking for a specific release?

Python releases by version number:

| Release version | Release date | | Click for more |
|-----------------|----------------|--------------------------|-------------------------------|
| Python 3.7.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.8.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.9.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.10.7 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.10.6 | Aug. 2, 2022 | Download | Release Notes |
| Python 3.10.5 | June 6, 2022 | Download | Release Notes |
| Python 3.9.13 | May 17, 2022 | Download | Release Notes |
| Python 3.10.4 | March 24, 2022 | Download | Release Notes |

[view older releases](#)

Python

■ Install Python

Download Page:

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

| Release version | Release date | Click for more | |
|-------------------------------|----------------|--------------------------|-------------------------------|
| Python 3.7.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.8.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.9.14 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.10.7 | Sept. 6, 2022 | Download | Release Notes |
| Python 3.10.6 | Aug. 2, 2022 | Download | Release Notes |
| Python 3.10.5 | June 6, 2022 | Download | Release Notes |
| Python 3.9.13 | May 17, 2022 | Download | Release Notes |
| Python 3.10.4 | March 24, 2022 | Download | Release Notes |

[View older releases](#)

Version 3.9.13 Click Download

■ Install Python

Check the "Files"

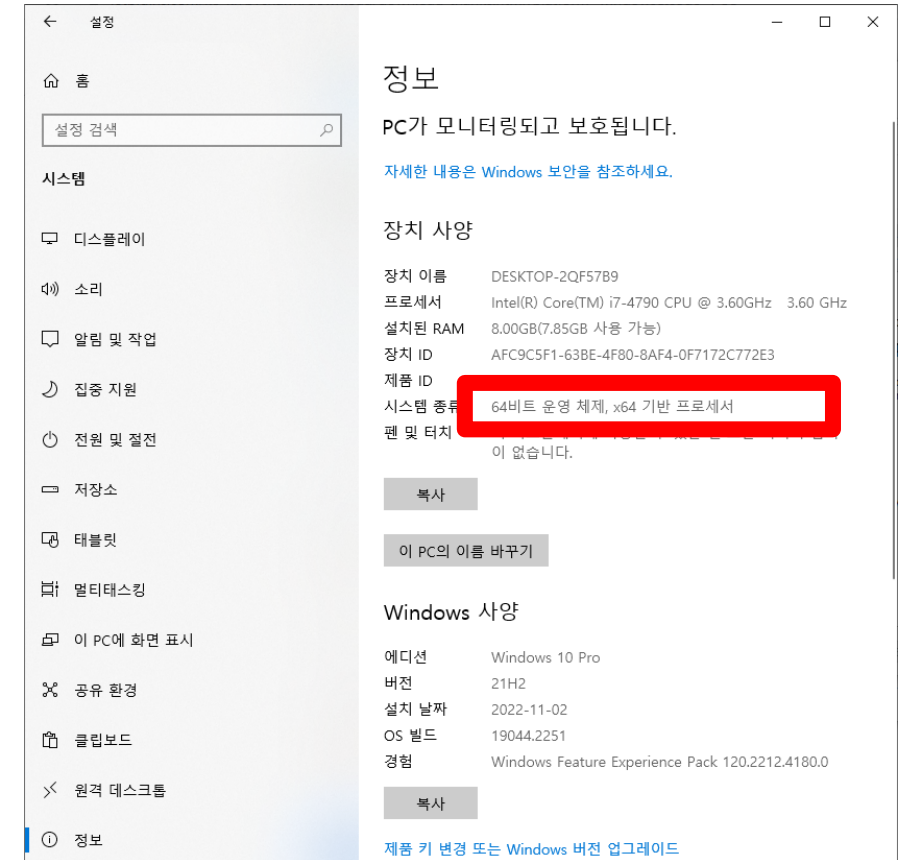
Python

■ Install Python

Files

| Version | Operating System | Description | MD5 Sum | File Size | GPG |
|---|------------------|--------------------------------------|-----------------------------------|-----------|---------------------|
| Gzipped source tarball | Source release | | eafda83543bad127cadef4d288fdbab87 | 26355887 | SIG |
| XZ compressed source tarball | Source release | | 5e2411217b0060828d5f923eb422a3b8 | 19754368 | SIG |
| macOS 64-bit Intel-only installer | macOS | for macOS 10.9 and later, deprecated | 671848930809decf27f586ddf98c6e9b | 30997161 | SIG |
| macOS 64-bit universal2 installer | macOS | for macOS 10.9 and later | 76b63cf623e32cdf27c5033434bd69ce | 38821163 | SIG |
| Windows embeddable package (32-bit) | Windows | | fec0bc06857502a56dd1aeaea6488ef8 | 7729405 | SIG |
| Windows embeddable package (64-bit) | Windows | | 57731cf80b1c429a0be7133266d7d7cf | 8570740 | SIG |
| Windows help file | Windows | | c86feba059b340a1de2a9d2ee7059a6d | 8953644 | SIG |
| Windows installer (32-bit) | Windows | | 46c35b0a2a4325c275b2ed3187b08ac4 | 28096840 | SIG |
| Windows installer (64-bit) | Windows | Recommended | e7062b85c3624af82079794729618eca | 29235432 | SIG |

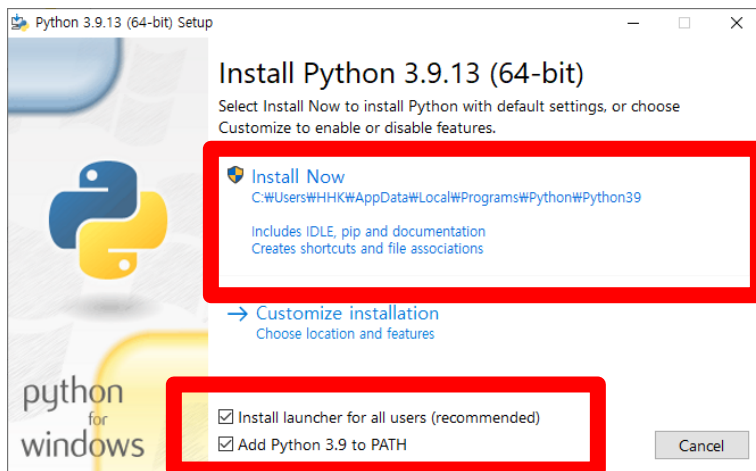
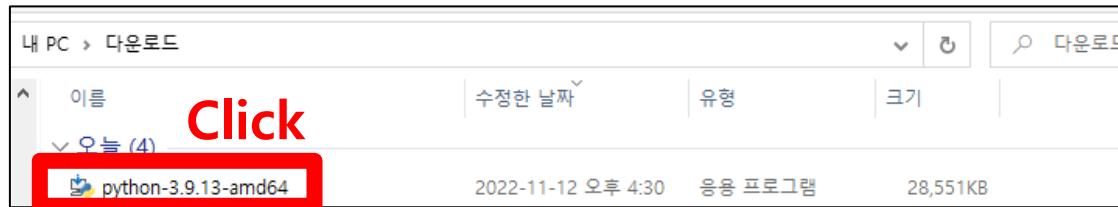
Select your PC hardware specifications (64-bit, 32-bit)



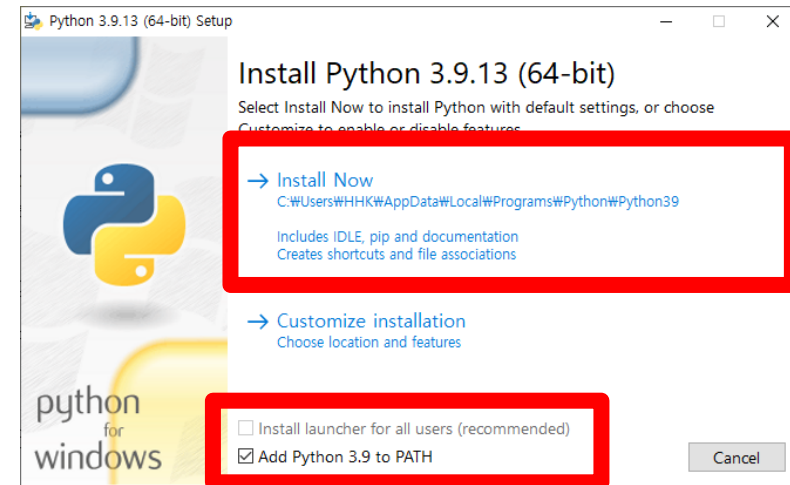
Hardware Specifications
Check out the first part of this document
(page 5)

Python

■ Install Python



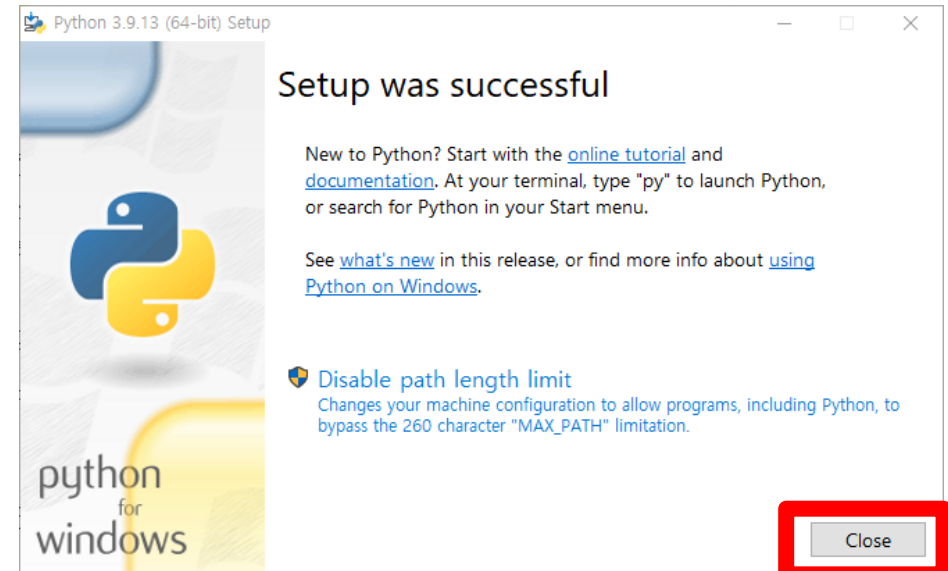
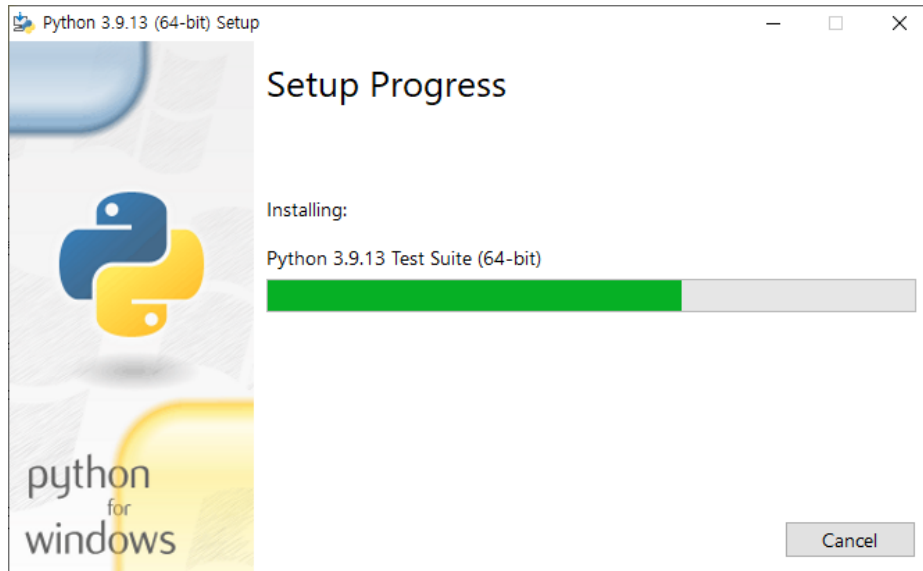
If both checkboxes are enabled
Check both



If only one is active
Check only the following

Python

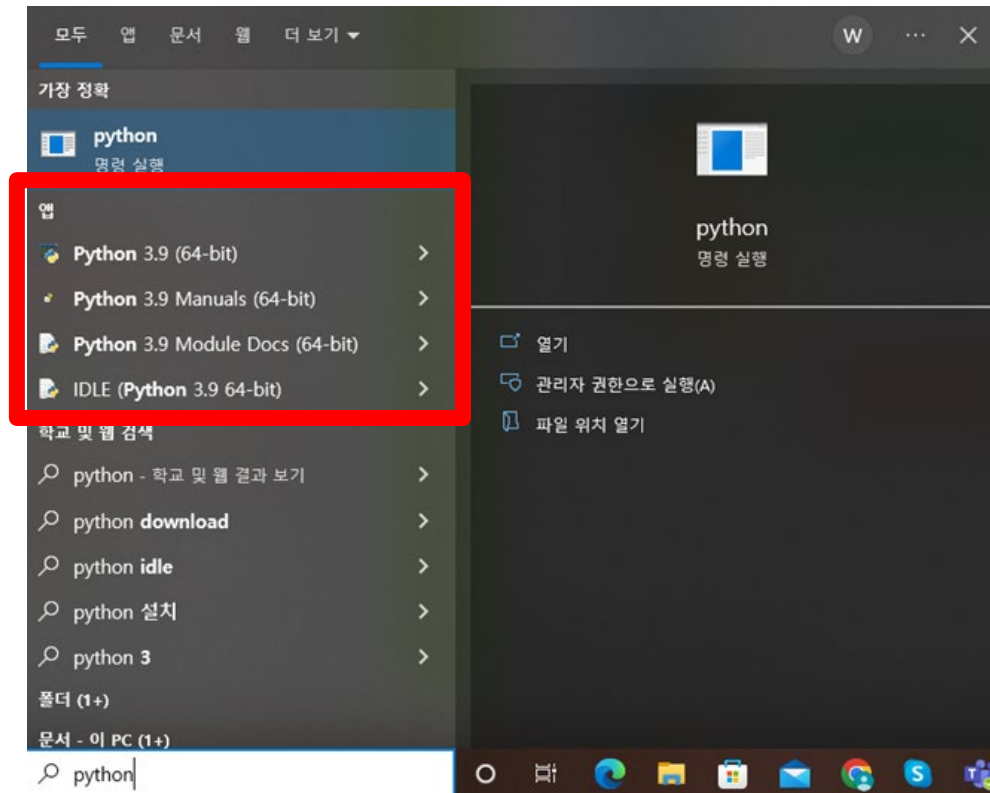
■ Install Python



Click

Python

■ Install Python



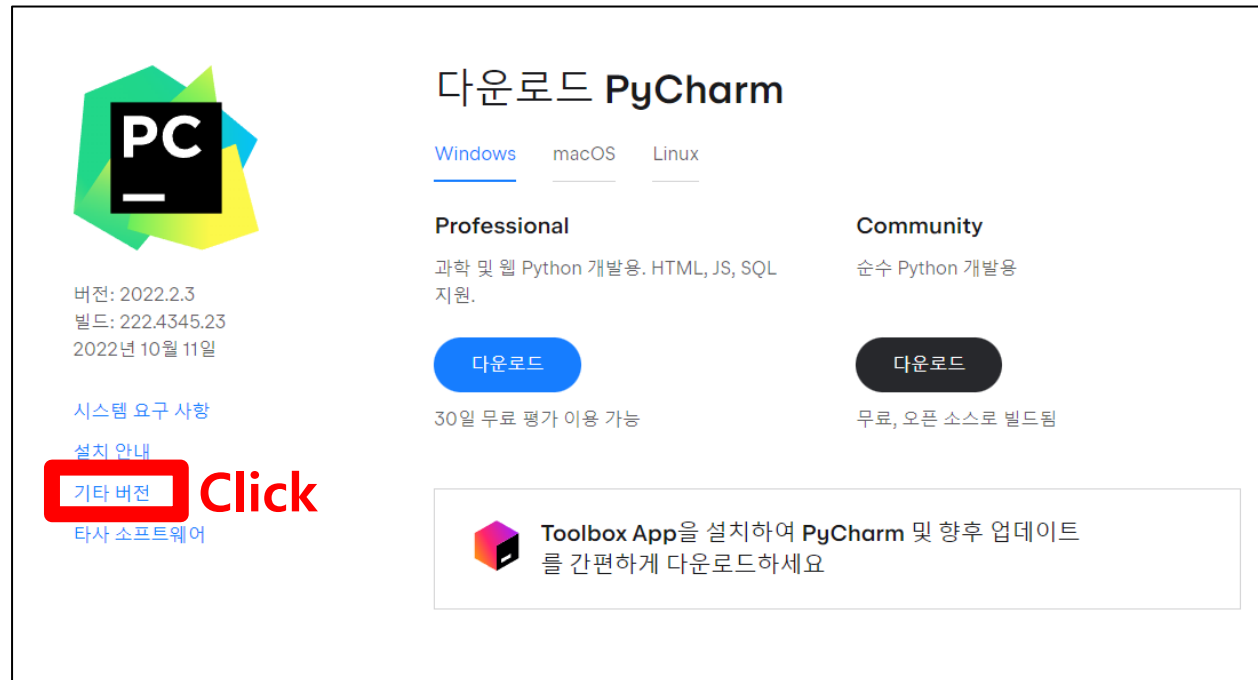
After searching for Python
Make sure the installation is complete

PyCharm

■ Install PyCharm

Download Page:

<https://www.jetbrains.com/ko-kr/pycharm/download/#section=windows>



다운로드 PyCharm

Windows macOS Linux

Professional
과학 및 웹 Python 개발용. HTML, JS, SQL 지원.

Community
순수 Python 개발용

버전: 2022.2.3
빌드: 222.4345.23
2022년 10월 11일

시스템 요구 사항
설치 안내
기타 버전 Click
타사 소프트웨어

다운로드

30일 무료 평가 이용 가능

다운로드

무료, 오픈 소스로 빌드됨

Toolbox App을 설치하여 PyCharm 및 향후 업데이트를 간편하게 다운로드하세요

PyCharm

■ Install PyCharm

기타 버전

Version 2022.2

PyCharm Professional Edition

[2022.2.3 - Linux \(tar.gz\)](#)

[2022.2.3 - Windows \(exe\)](#)

[2022.2.3 - macOS \(dmg\)](#)

[2022.2.3 - macOS Apple Silicon \(dmg\)](#)

PyCharm Community Edition

[2022.2.3 - Linux \(tar.gz\)](#)

[2022.2.3 - Windows \(exe\)](#)

[2022.2.3 - macOS \(dmg\)](#)

[2022.2.3 - macOS Apple Silicon \(dmg\)](#)

Version 2022.1

PyCharm Professional Edition

[2022.1.4 - Linux \(tar.gz\)](#)

[2022.1.4 - Windows \(exe\)](#)

[2022.1.4 - macOS \(dmg\)](#)

[2022.1.4 - macOS Apple Silicon \(dmg\)](#)

PyCharm Community Edition

[2022.1.4 - Linux \(tar.gz\)](#)

[2022.1.4 - Windows \(exe\)](#)

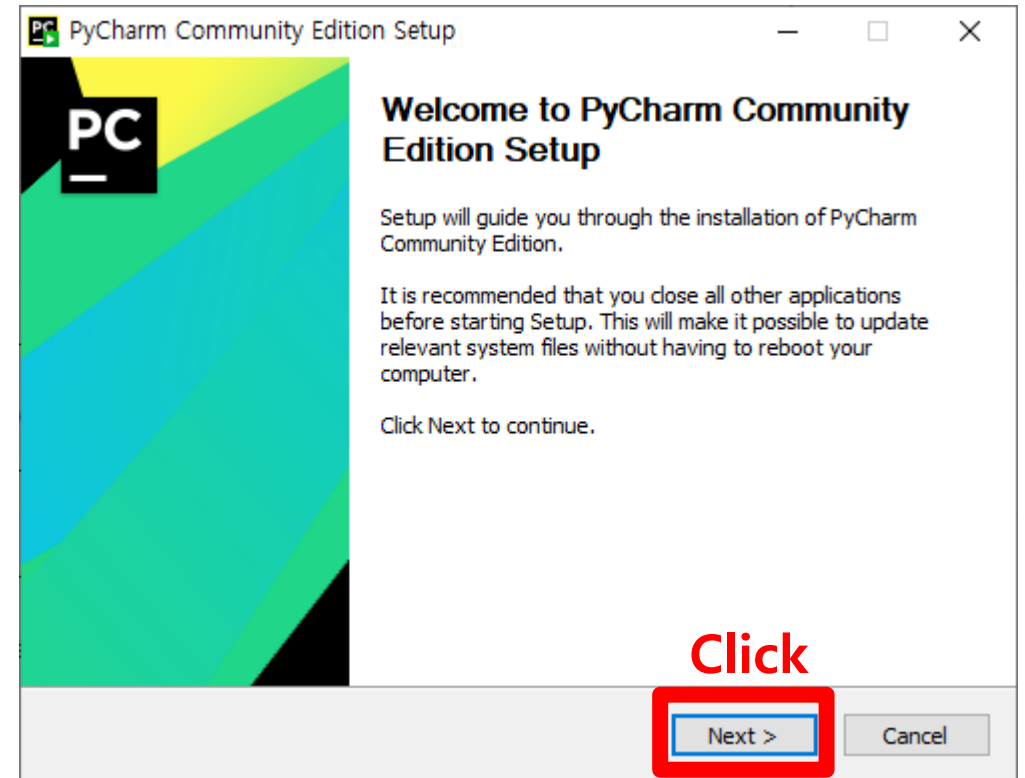
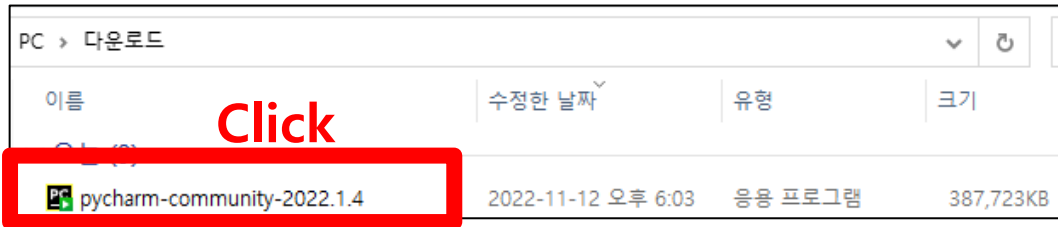
[2022.1.4 - macOS \(dmg\)](#)

[2022.1.4 - macOS Apple Silicon \(dmg\)](#)

Click

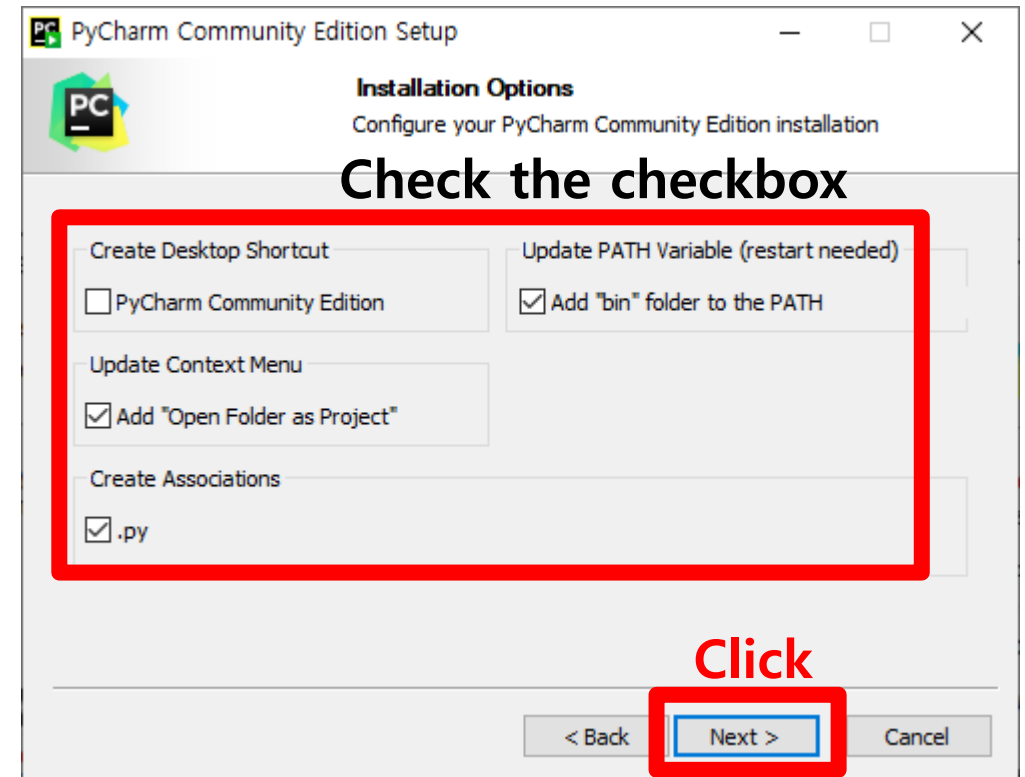
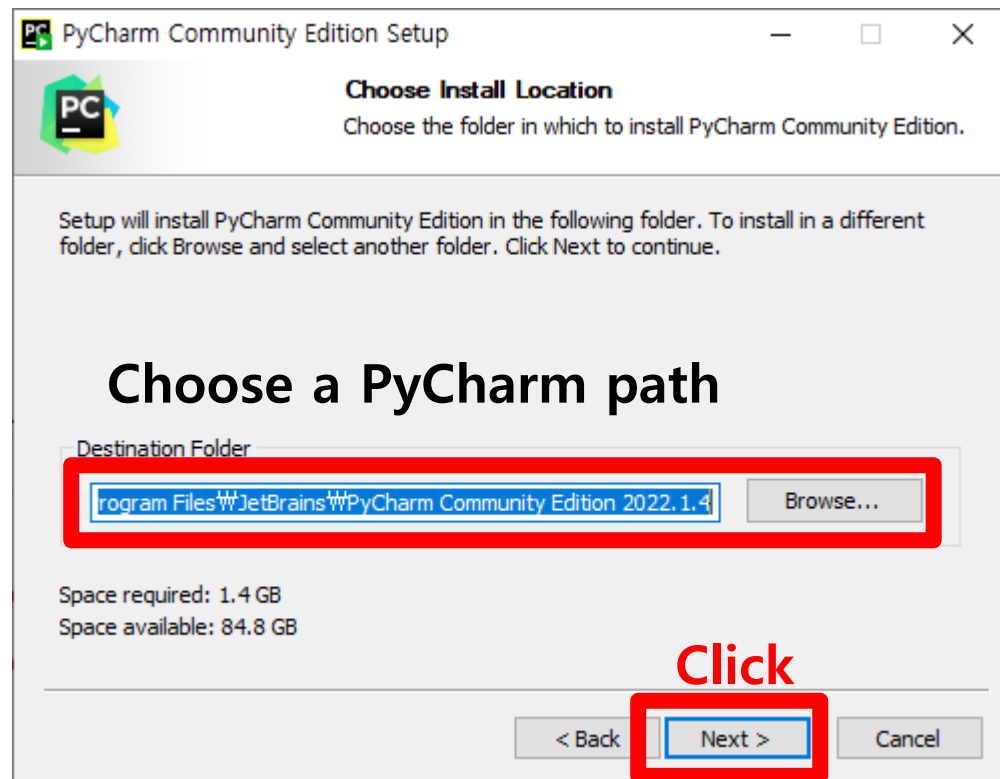
PyCharm

■ Install PyCharm



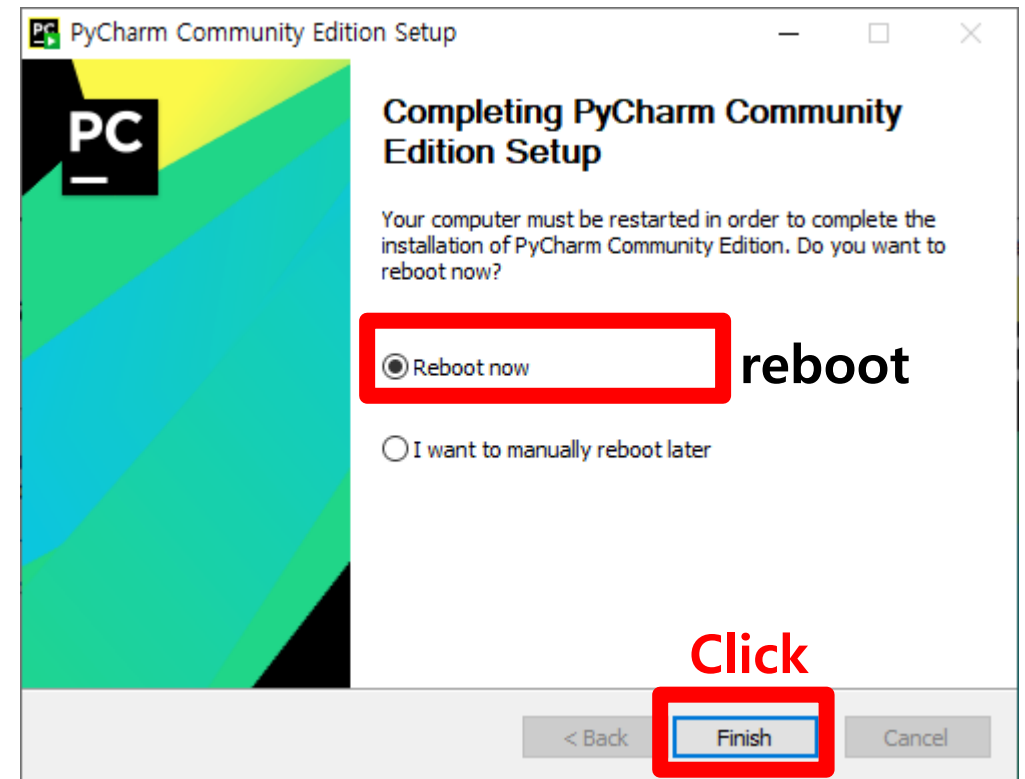
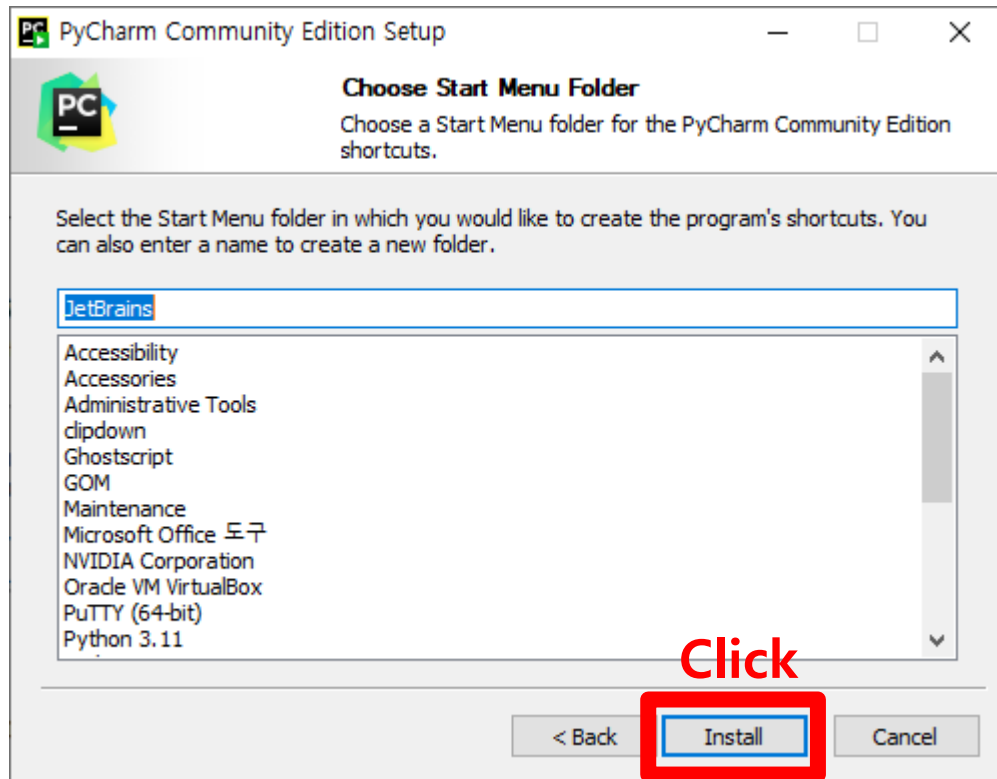
PyCharm

■ Install PyCharm



PyCharm

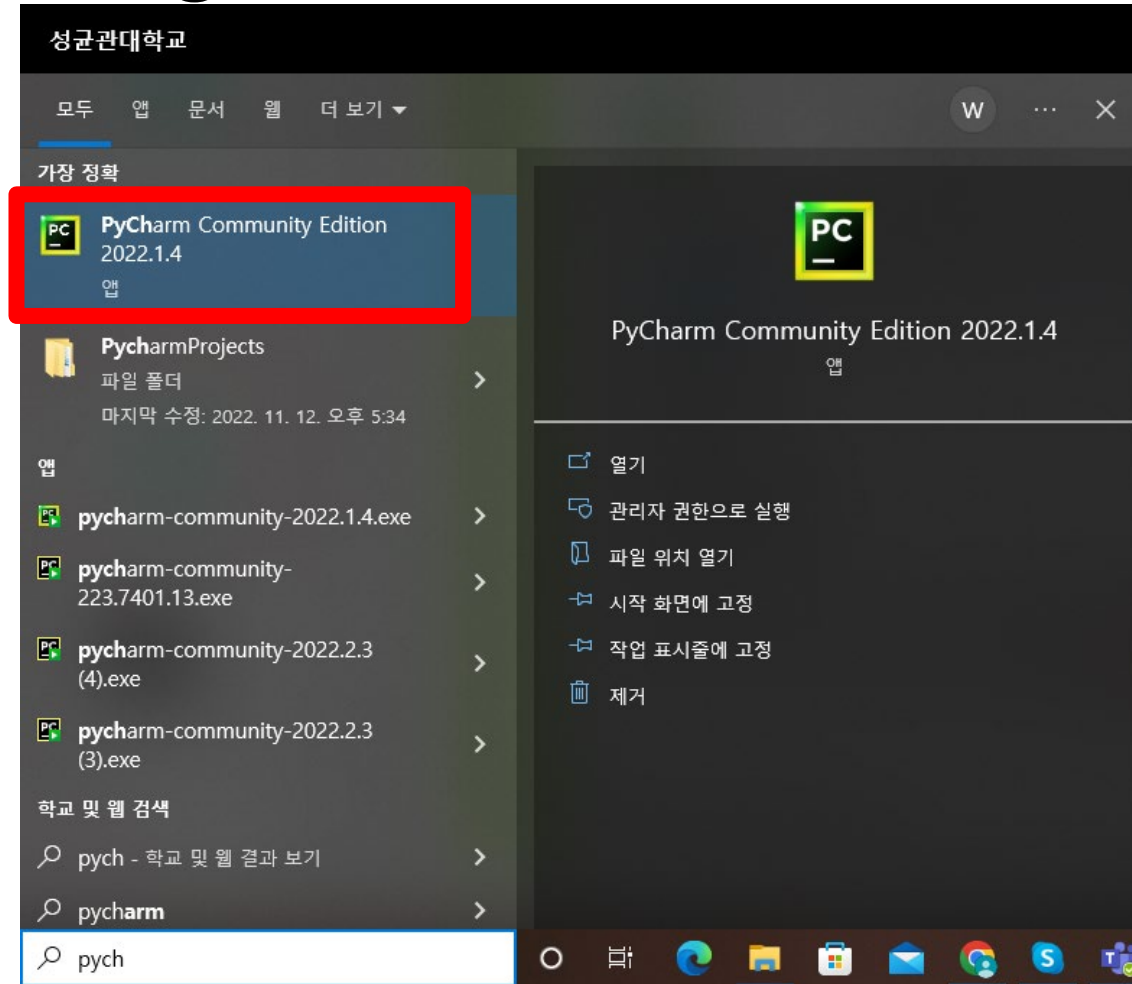
■ Install PyCharm



PyCharm

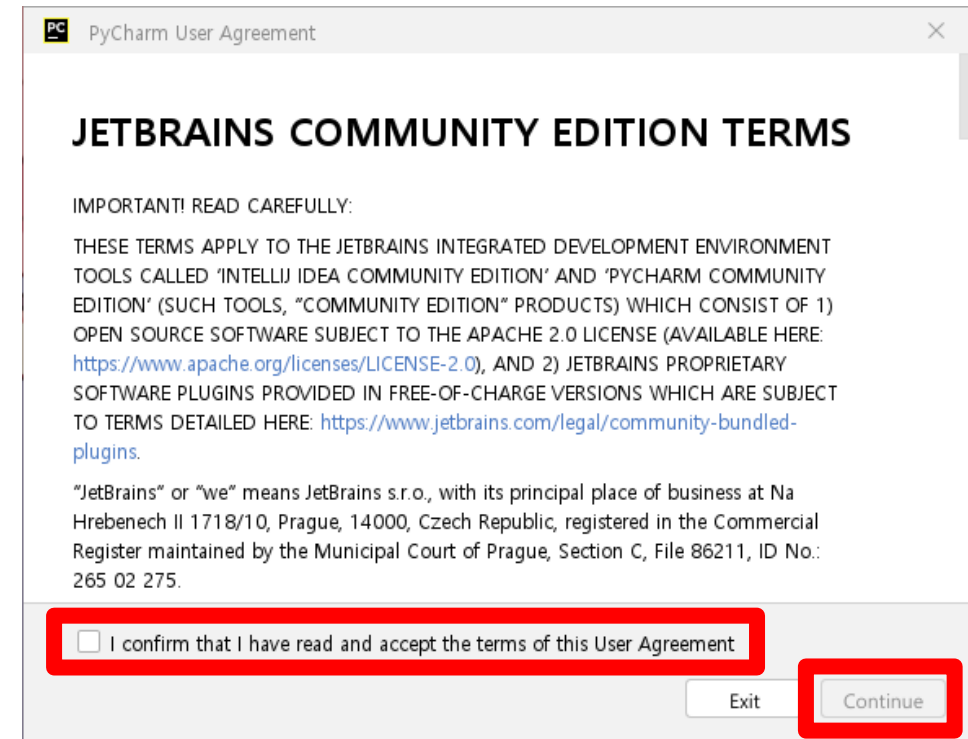
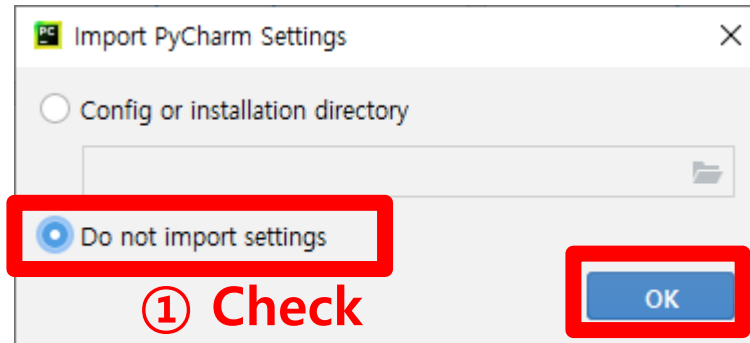
■ Interpreter setting

Run PyCharm



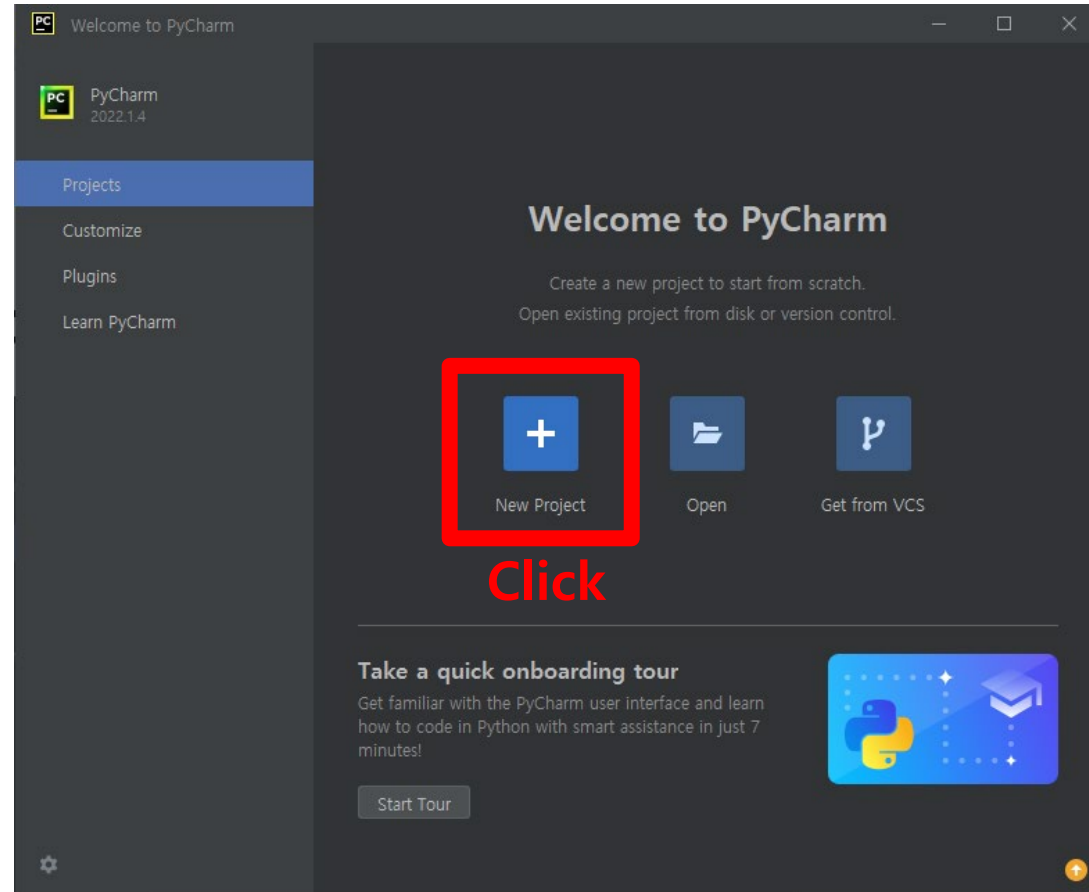
PyCharm

■ Interpreter setting



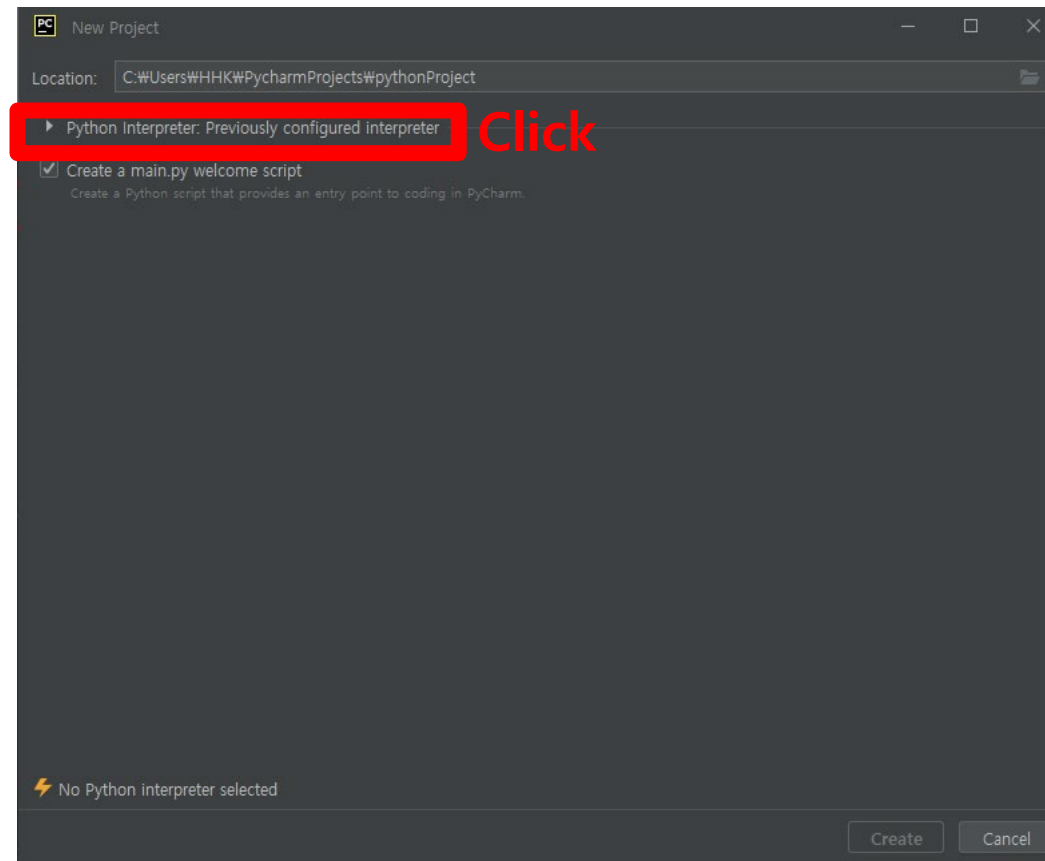
PyCharm

■ Interpreter setting



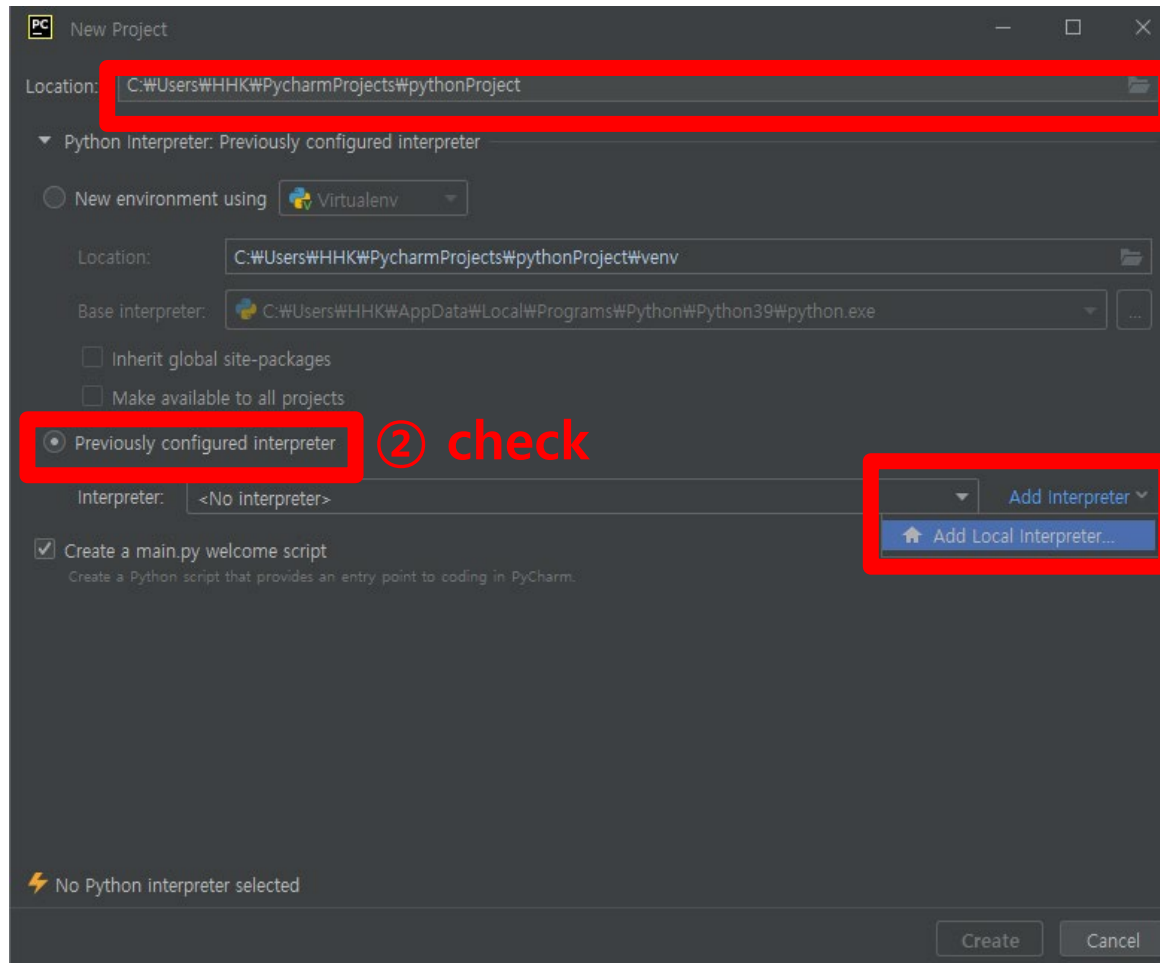
PyCharm

■ Interpreter setting



PyCharm

■ Interpreter setting



① Locate Project Files Folders
(Keep Initial Value)

③ Add Interpreter
->Add Local Interpreter **클릭**

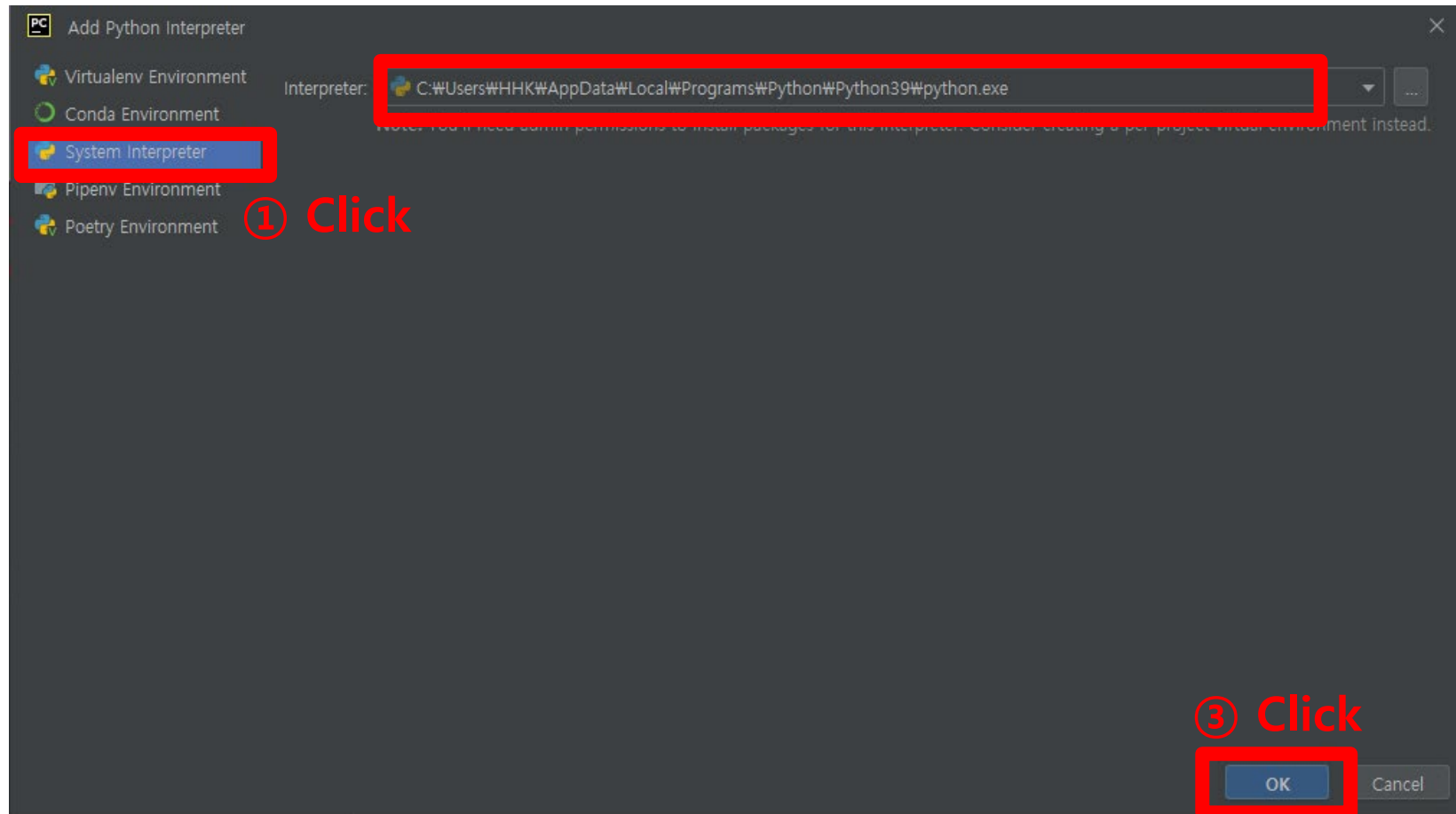


③-1 If it pops up like this
Click the ... to proceed

PyCharm

■ Interpreter setting

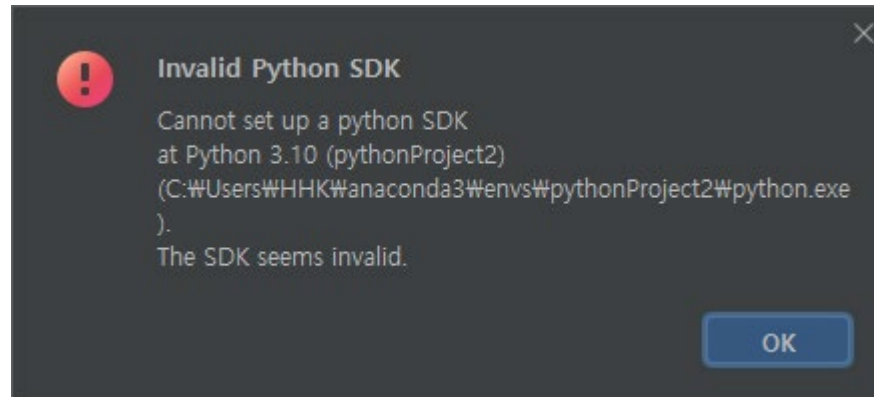
② Interpreter check



If you don't have an Interpreter,
Python not installed
Requires Python
reinstallation

PyCharm

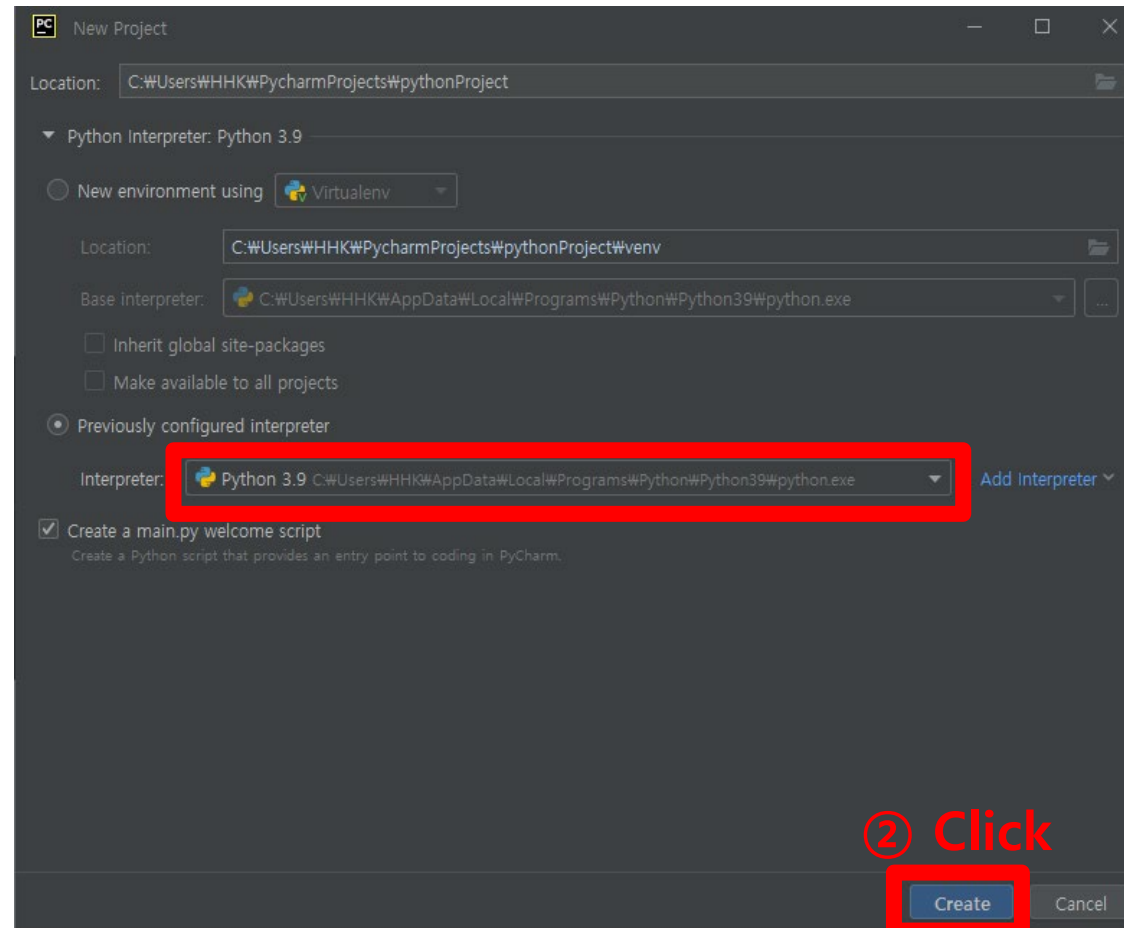
■ Interpreter setting



**When you encounter the following error:
Reinstall to 2022.1.4 version**

PyCharm

■ Interpreter setting

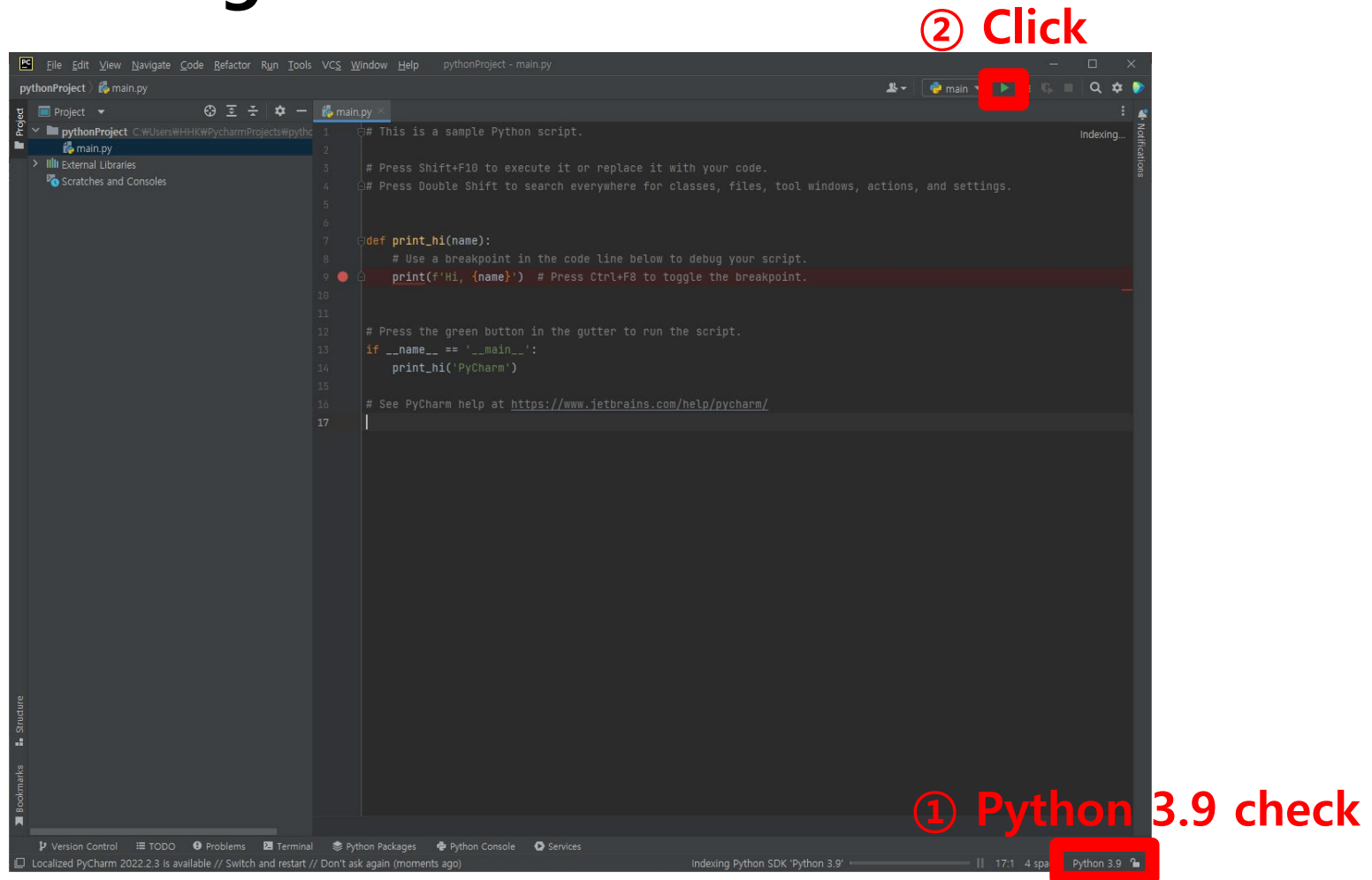


① interpreter check
(Python 3.9)

② Click

PyCharm

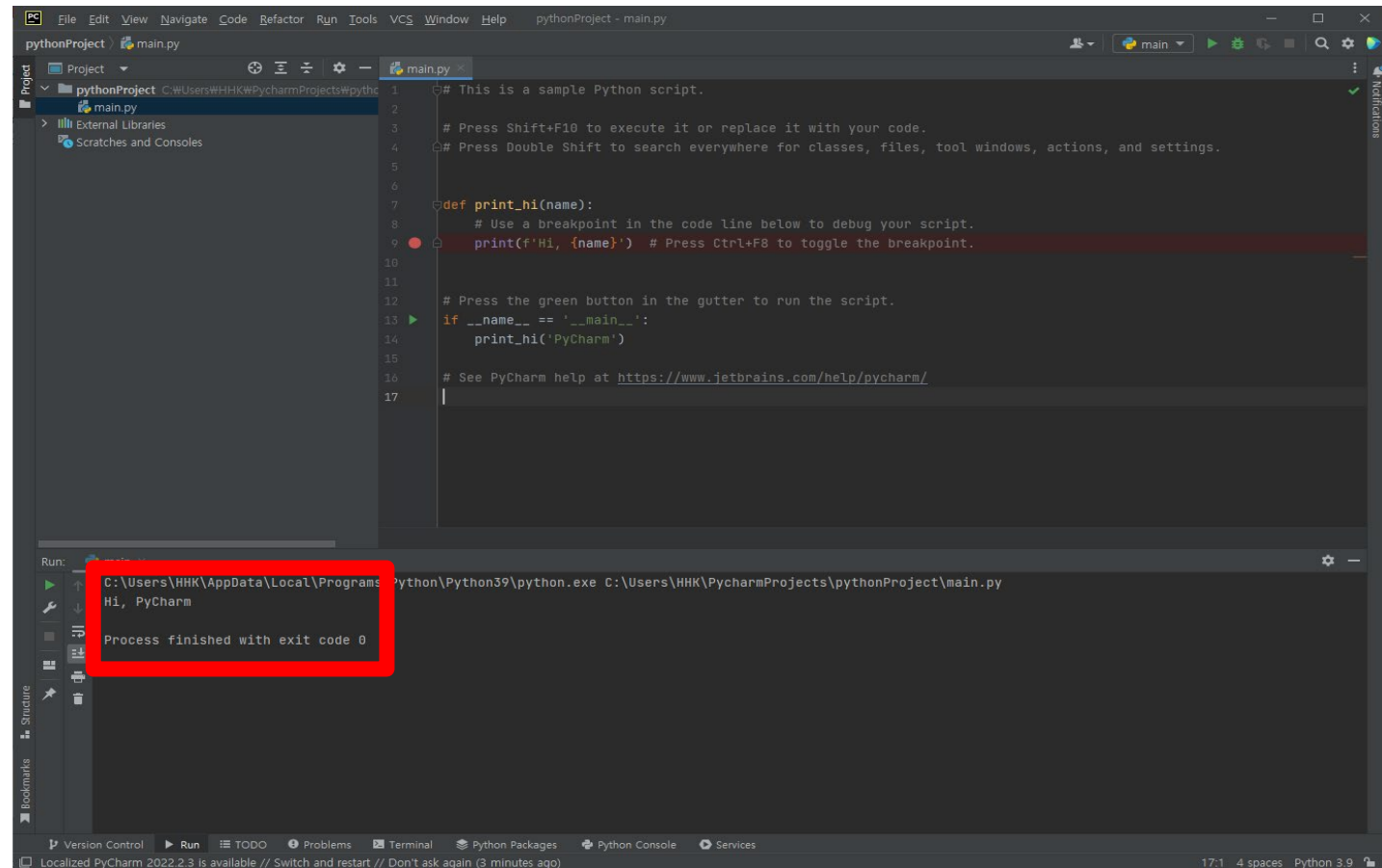
■ Interpreter setting



PyCharm

■ Interpreter setting

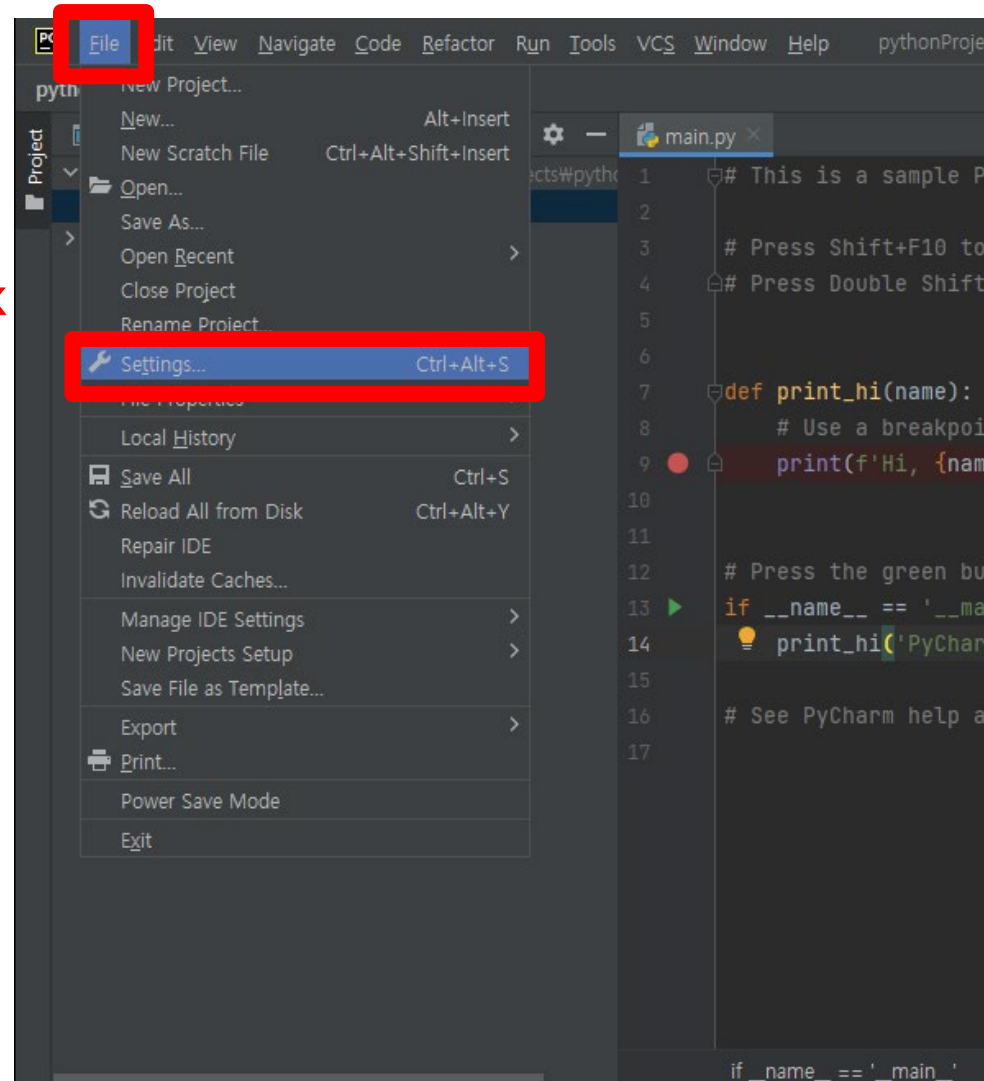
'Hi, PyCharm' is
out



Library

■ Install the library

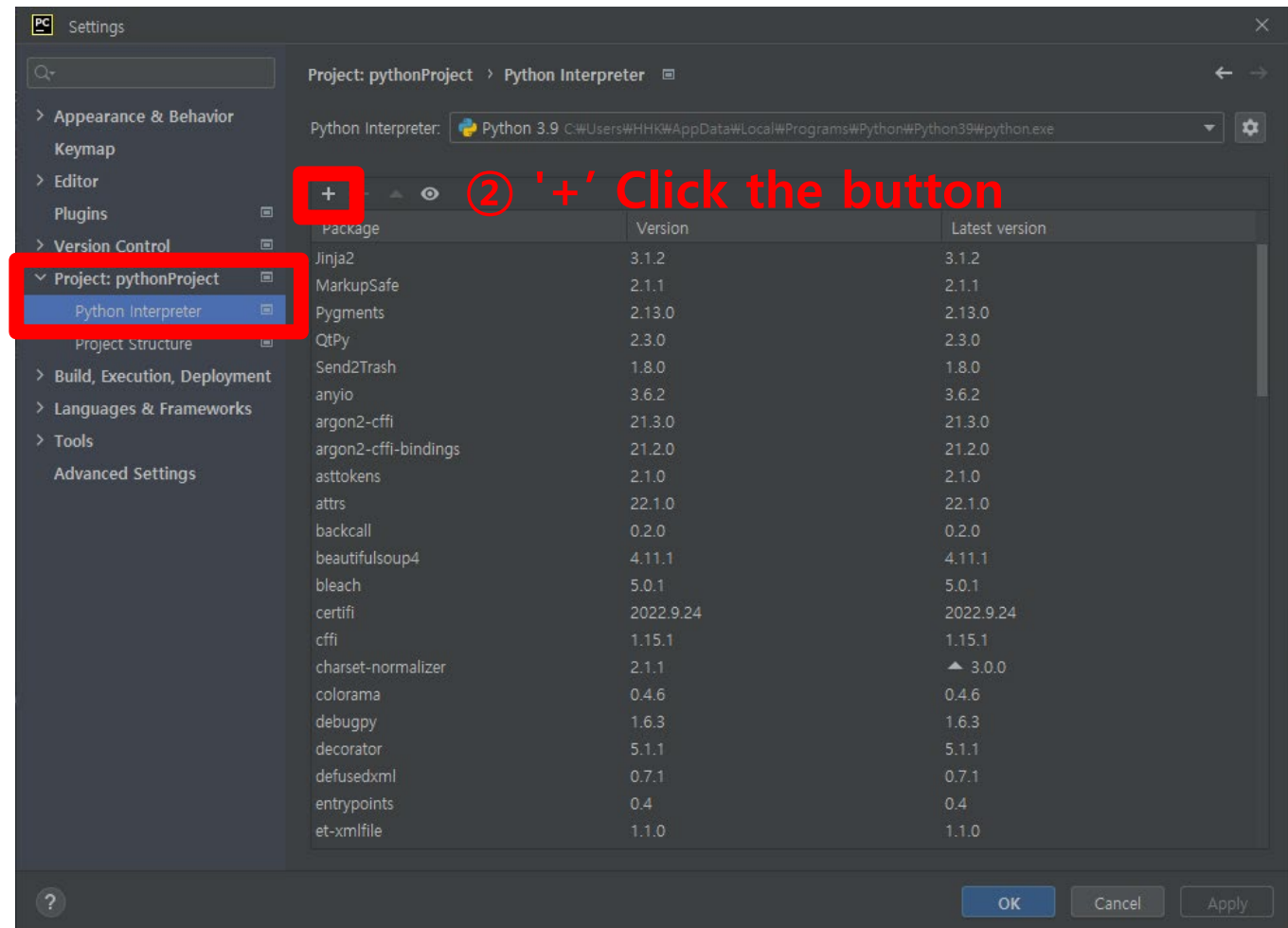
File - Settings Click



Library

■ Install the library

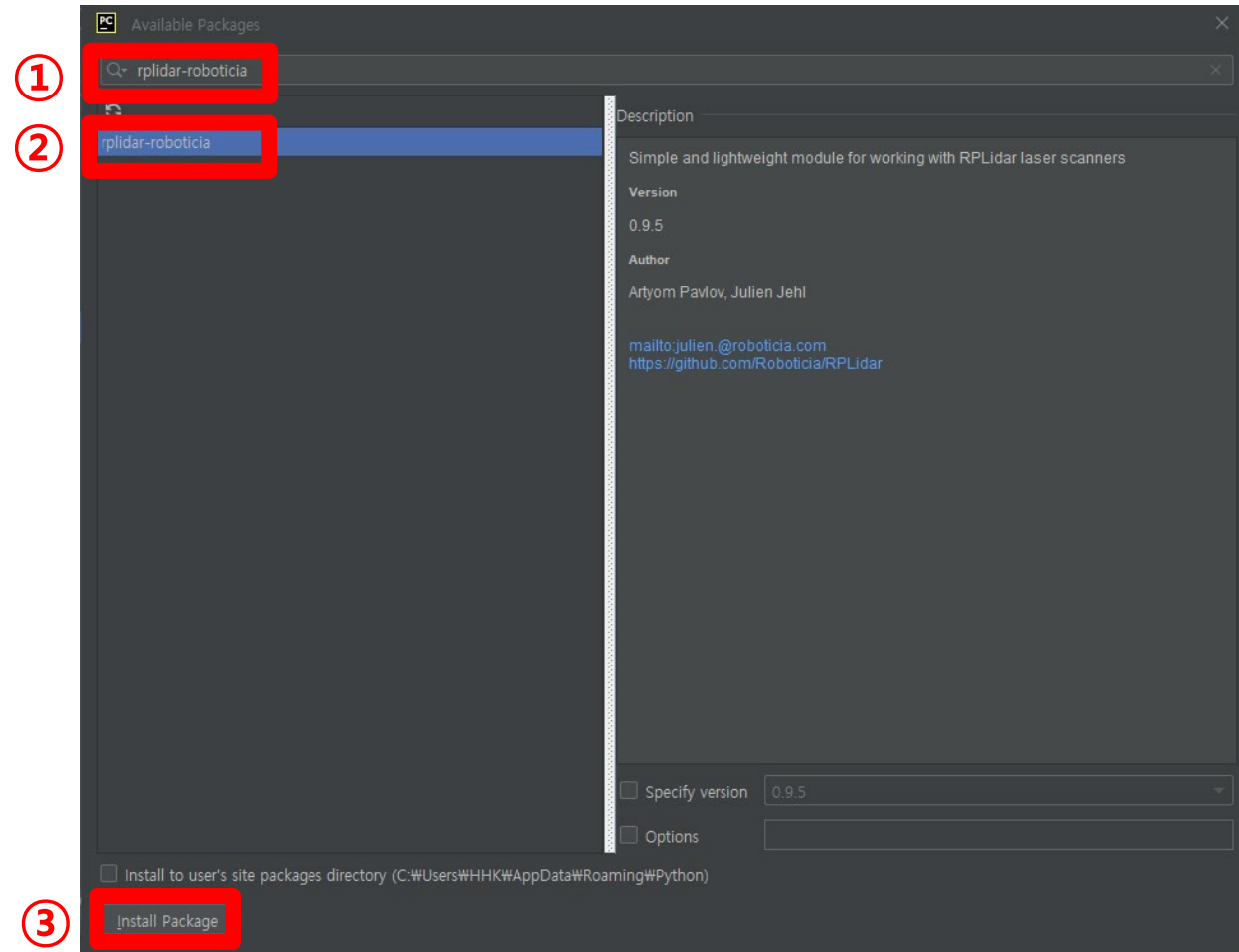
- ① Project: <Project Name>
-> Python Interpreter **Check**



Library

■ Install LiDAR library

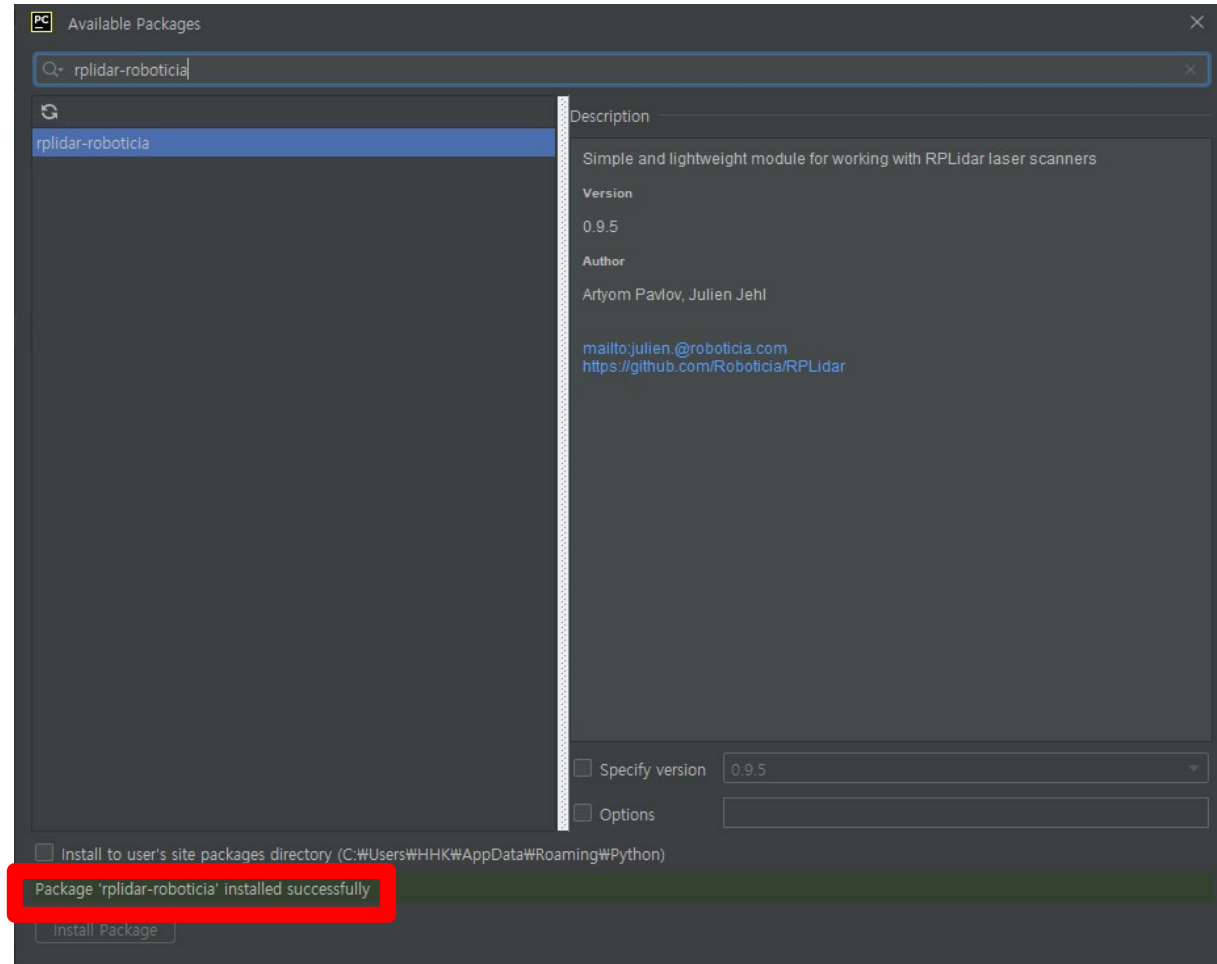
- ① rplidar-roboticia search
- ② rplidar-roboticia check
- ③ Install Package Click



Library

■ Install LiDAR library

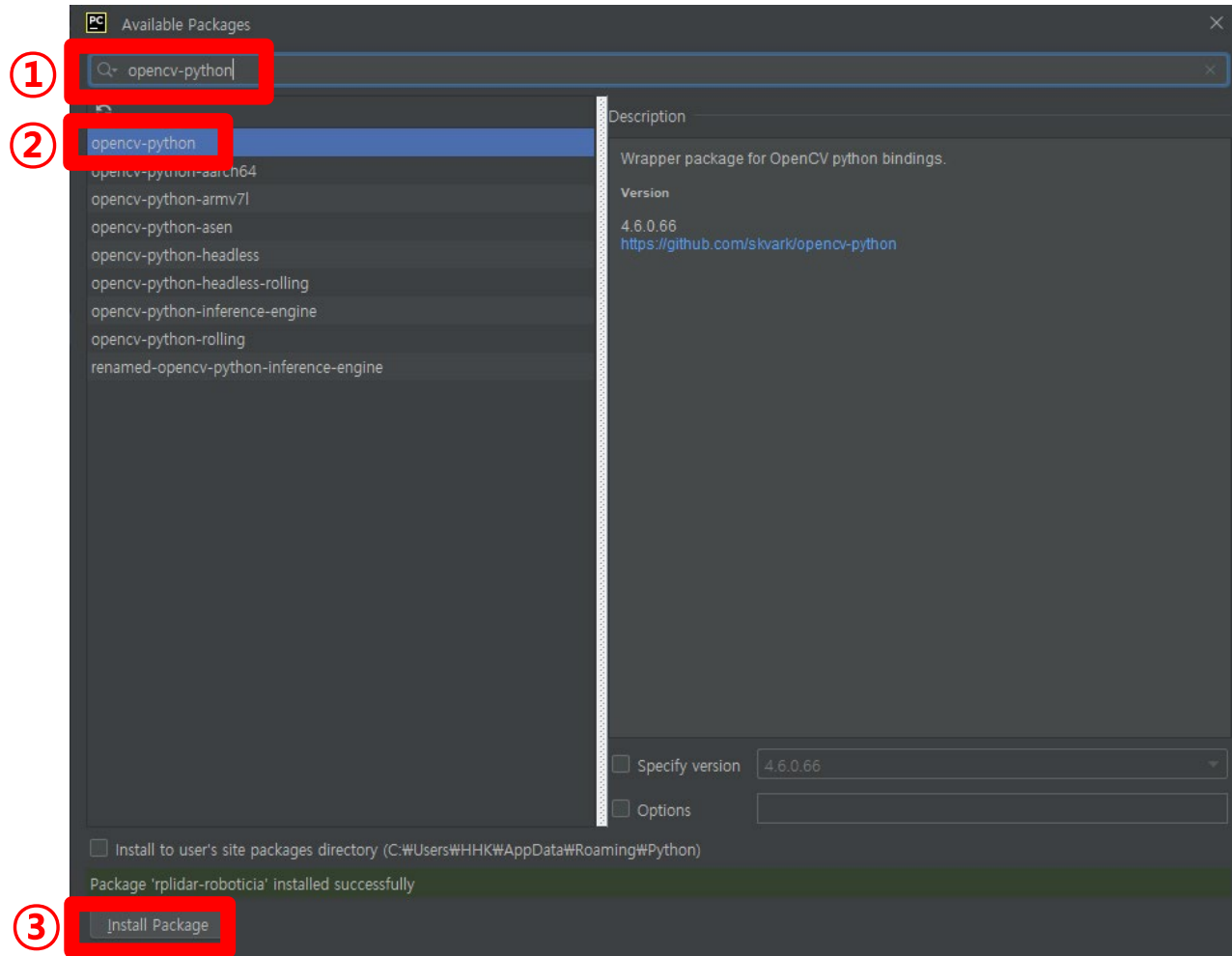
Check the installation
success message



Library

■ Install Camera library

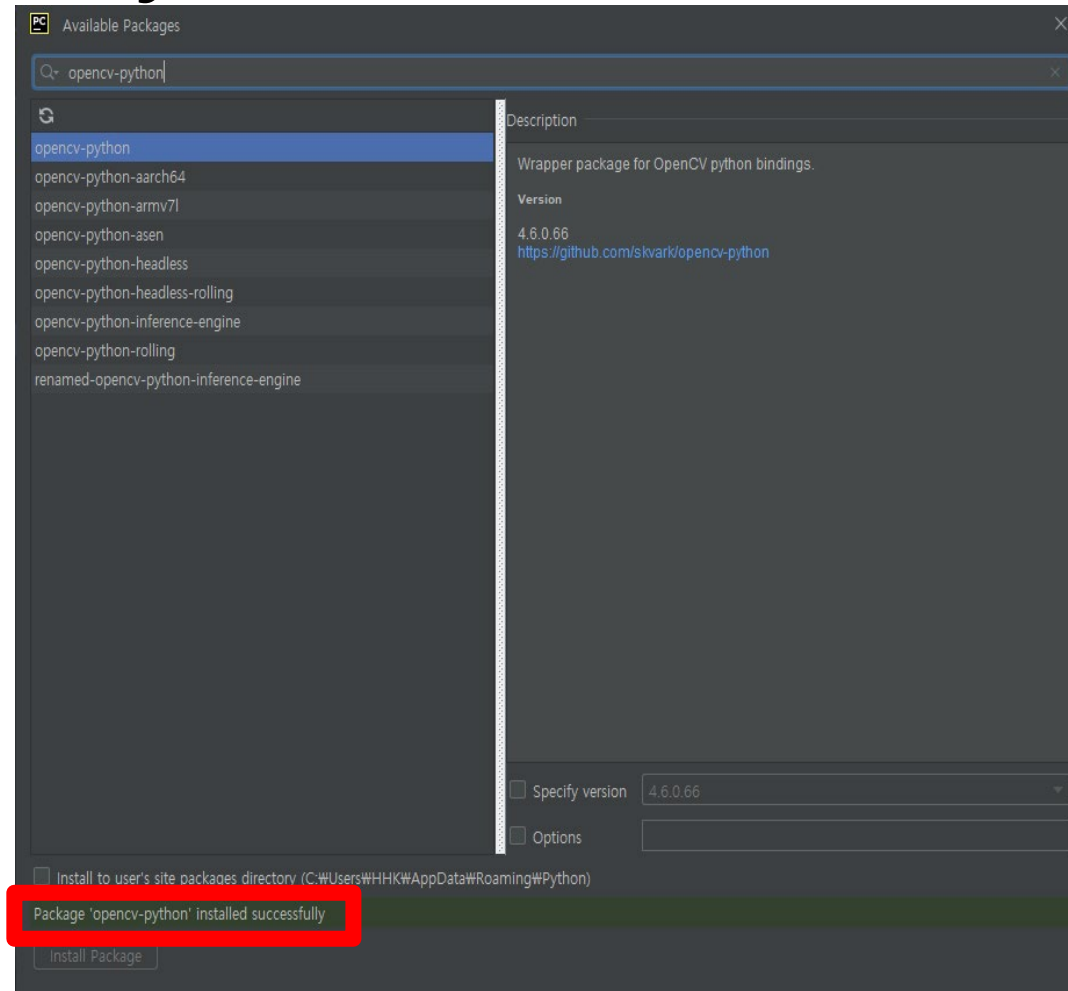
- ① opencv-python search
- ② opencv-python check
- ③ Install Package click



Library

■ Install Camera Library

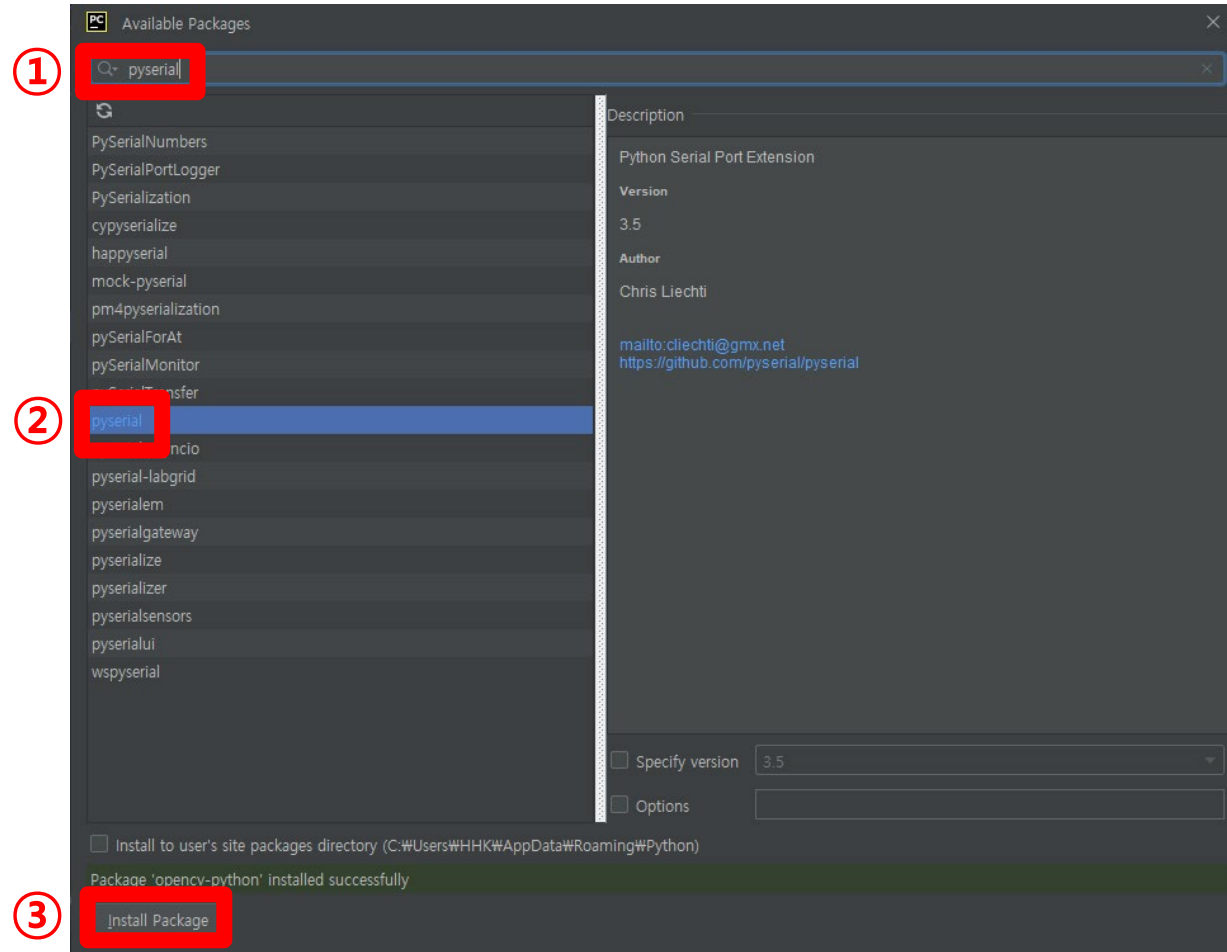
Check the installation
success message



Library

■ Install the Serial Communication Library

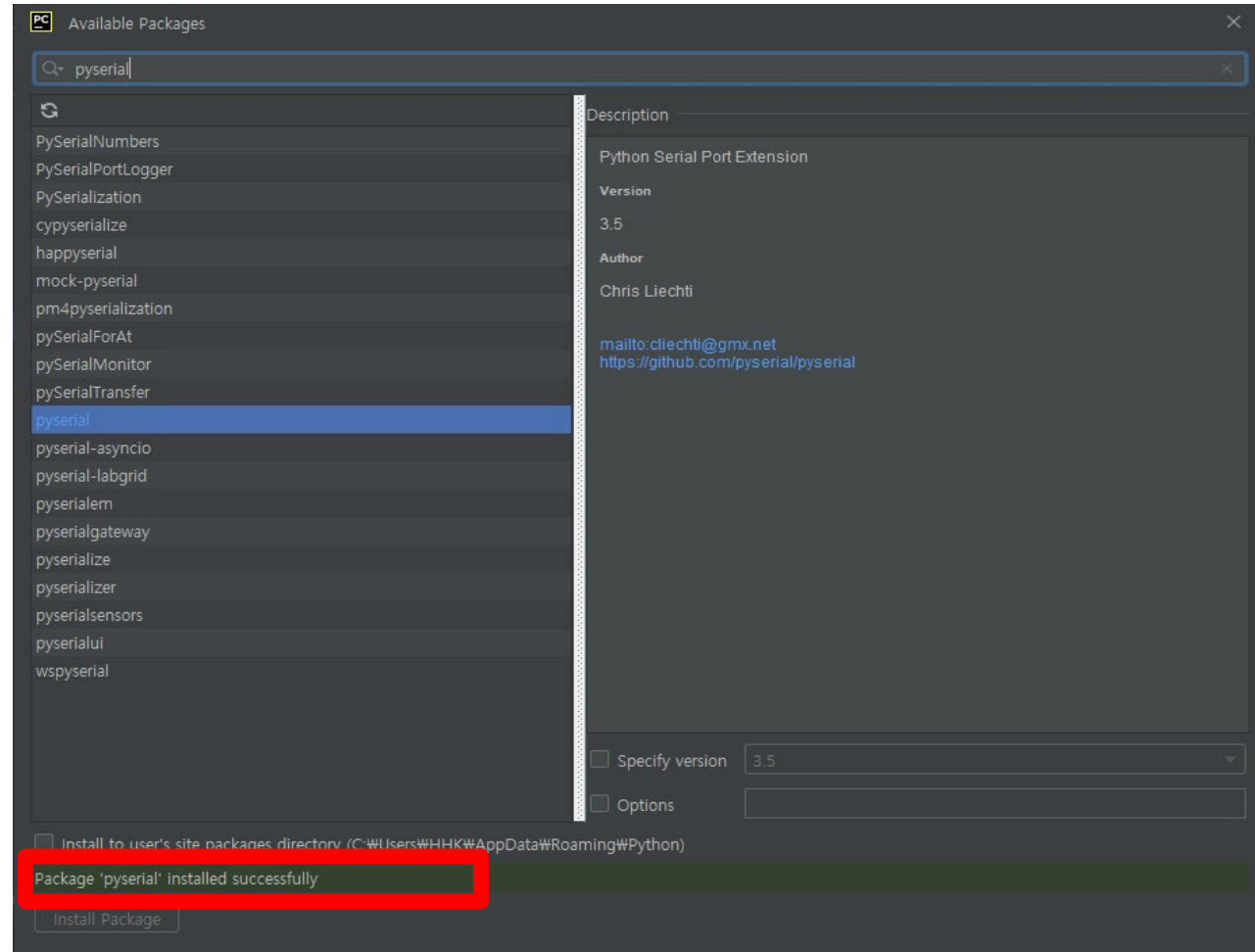
- ① pyserial search
- ② pyserial check
- ③ Install Package Click



Library

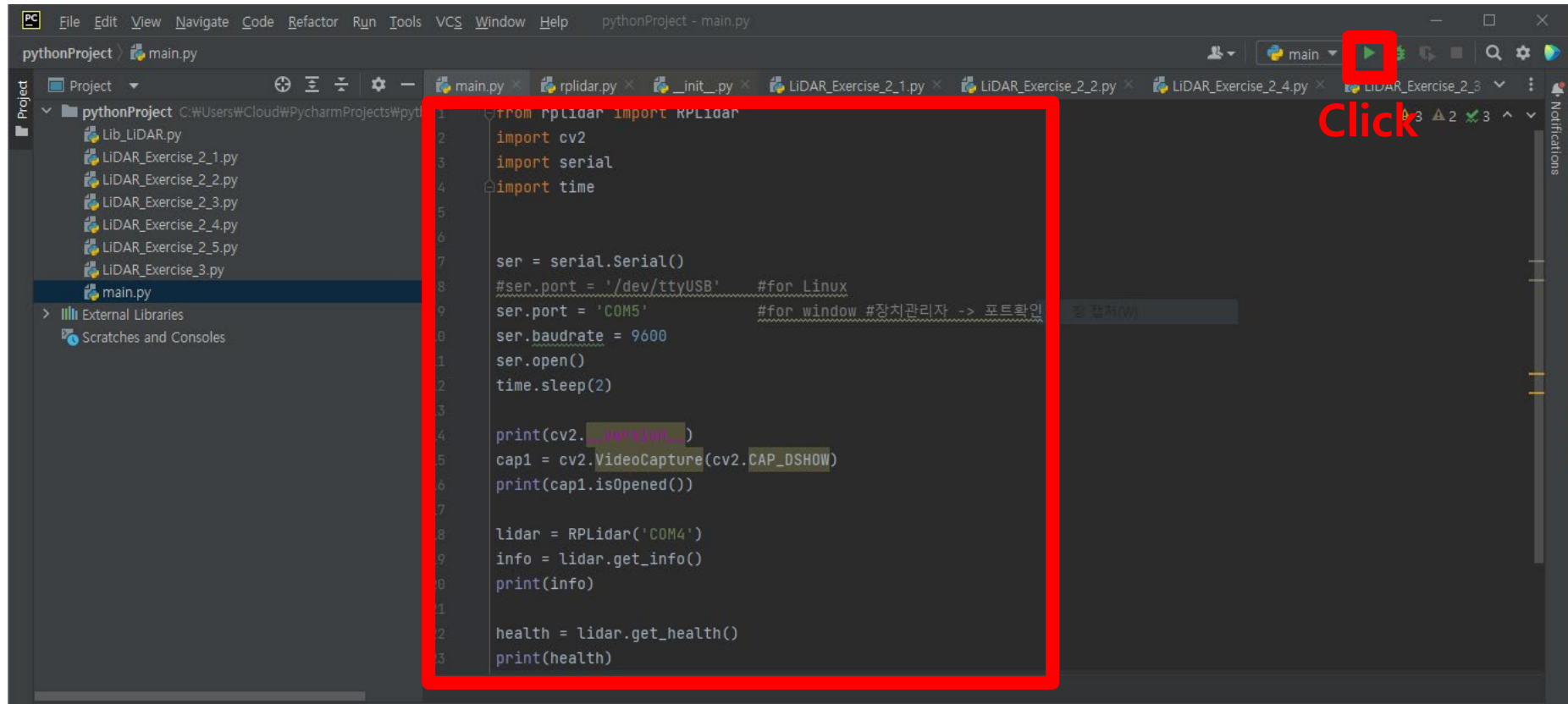
■ Install the Serial Communication Library

Check the installation
success message



Exercise

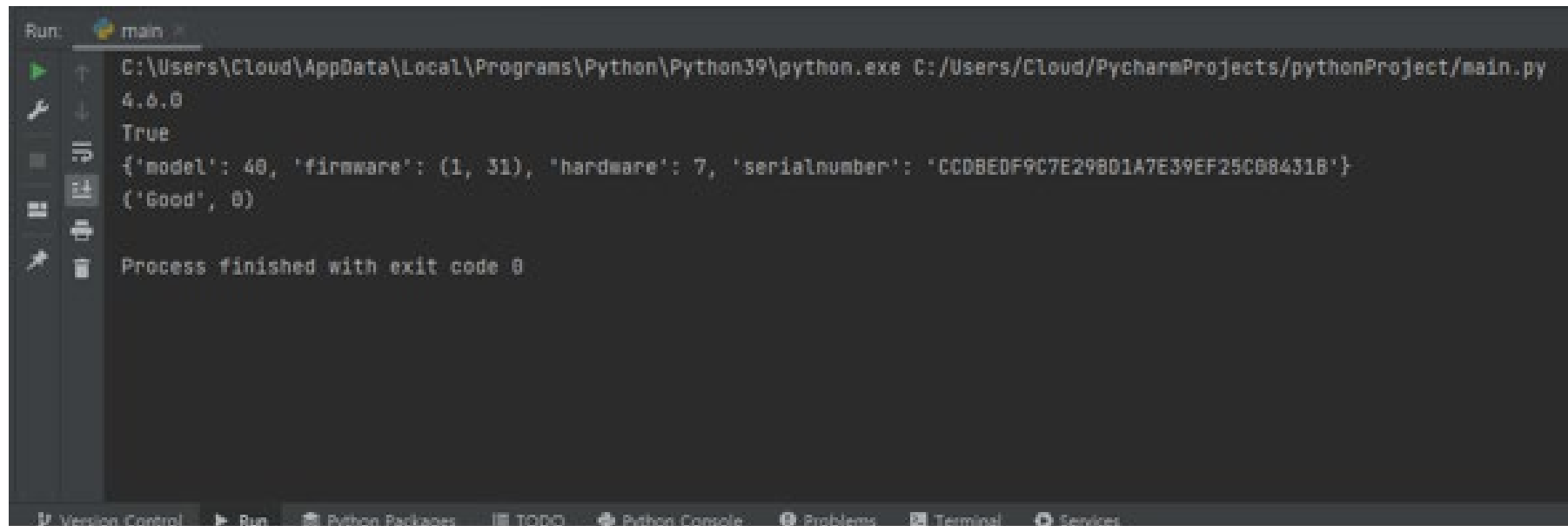
■ Check library and device installation



Run test code

Exercise

■ Check library and device installation



The screenshot shows a PyCharm Run console window. The top bar indicates the file being run is 'main.py'. The console output is as follows:

```
C:\Users\Cloud\AppData\Local\Programs\Python\Python39\python.exe C:/Users/Cloud/PycharmProjects/pythonProject/main.py
4.0.0
True
{'model': 40, 'firmware': (1, 31), 'hardware': 7, 'serialnumber': 'CCDBEDF9C7E298D1A7E39EF25CB8431B'}
('Good', 0)
Process finished with exit code 0
```

The bottom of the window shows a toolbar with icons for Version Control, Run, Python Packages, TODO, Python Console, Problems, Terminal, and Services.

**Printing the following phrase means
Installation is done correctly**

Thank You!

Automation Lab

