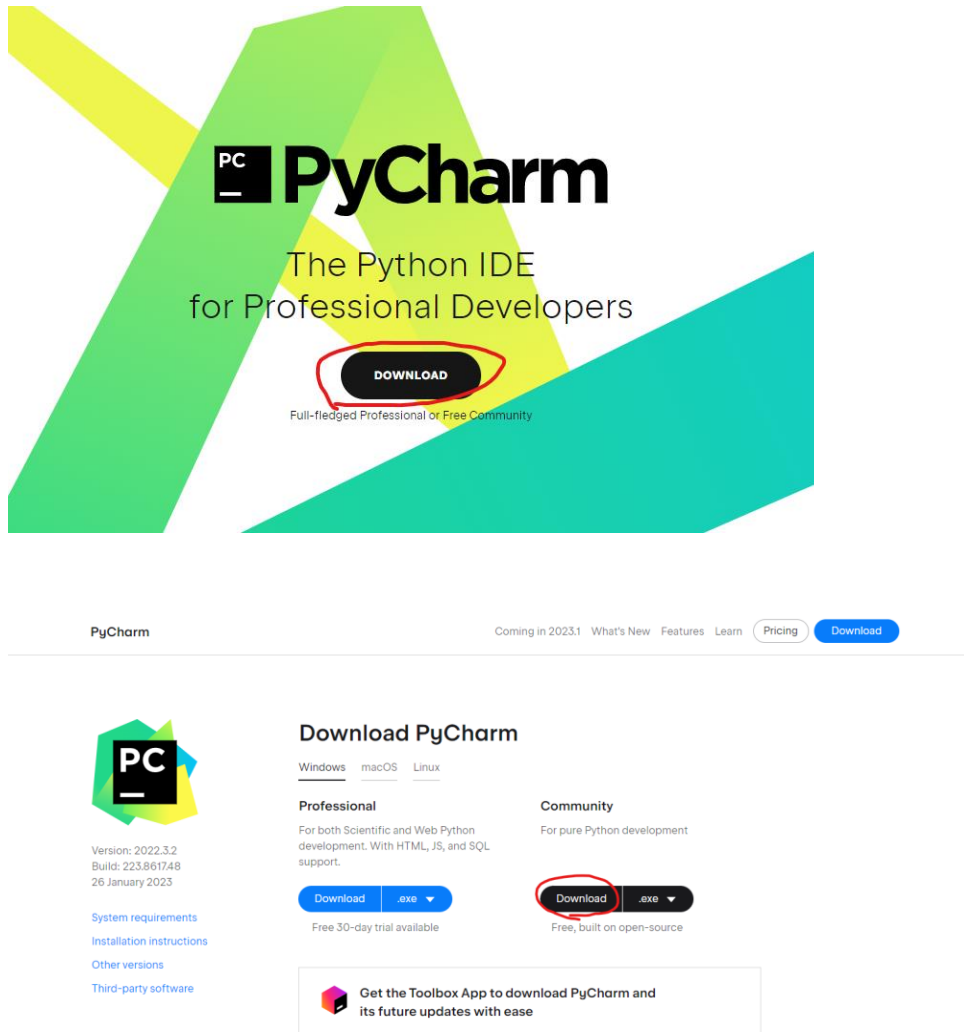


1. Download Python IDE (Pycharm)

1.1 ดาวน์โหลด [PyCharm: the Python IDE for Professional Developers by JetBrains](#)



The image shows the PyCharm landing page. At the top, there's a large graphic with the PyCharm logo and the text "The Python IDE for Professional Developers". Below this, there's a "DOWNLOAD" button circled in red. Underneath the button, it says "Full-fledged Professional or Free Community".

PyCharm

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Version: 2022.3.2
Build: 223.8617.48
26 January 2023

[System requirements](#)
[Installation instructions](#)
[Other versions](#)
[Third-party software](#)

 Get the Toolbox App to download PyCharm and its future updates with ease

2. Download Python

2.1 ดาวน์โหลด [Welcome to Python.org](https://www.python.org/)

python™

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```
# Python 3: List comprehensions
>>> fruits = ['Banana', 'Apple', 'Lime']
>>> loud_fruits = [fruit.upper() for fruit in fruits]
>>> print(loud_fruits)
['BANANA', 'APPLE', 'LIME']

# List and the enumerate function
>>> list(enumerate(fruits))
[(0, 'Banana'), (1, 'Apple'), (2, 'Lime')]
```

Compound Data Types

Lists (known as arrays in other languages) are one of the compound data types that Python understands. Lists can be indexed, sliced and manipulated with other built-in functions. [More about lists in Python 3](#)

1 2 3 4 5

Python is a programming language that lets you work quickly and integrate systems more effectively. [>>> Learn More](#)

Get Started
Whether you're new to programming or an experienced developer, it's easy to learn and use Python.
[Start with our Beginner's Guide](#)

Download
Python source code and installers are available for download for all versions!
Latest: Python 3.11.2

Docs
Documentation for Python's standard library, along with tutorials and guides, are available online.
docs.python.org

Jobs
Looking for work or have a related position that you want to hire for? Our [relaunch community-run job board](#) is the place to go.

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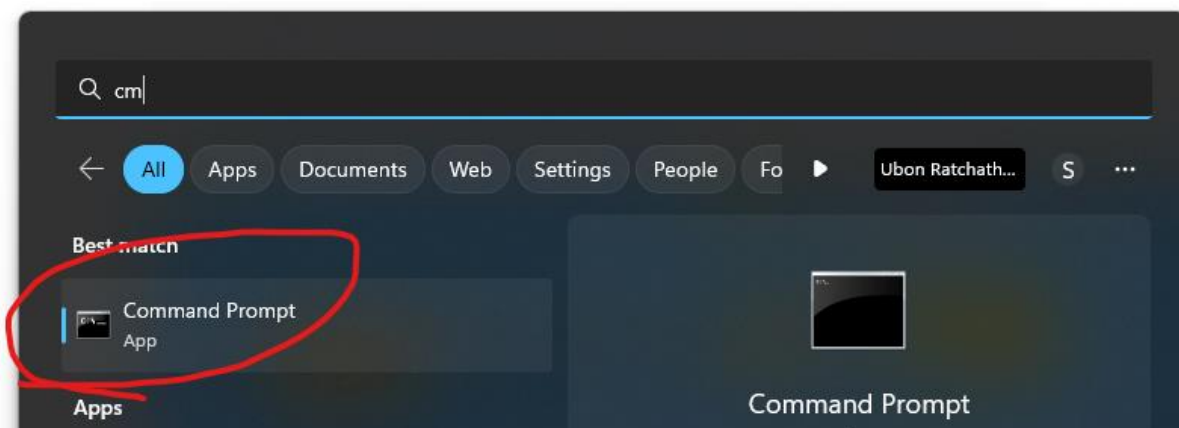
Download Python 3.11.2

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

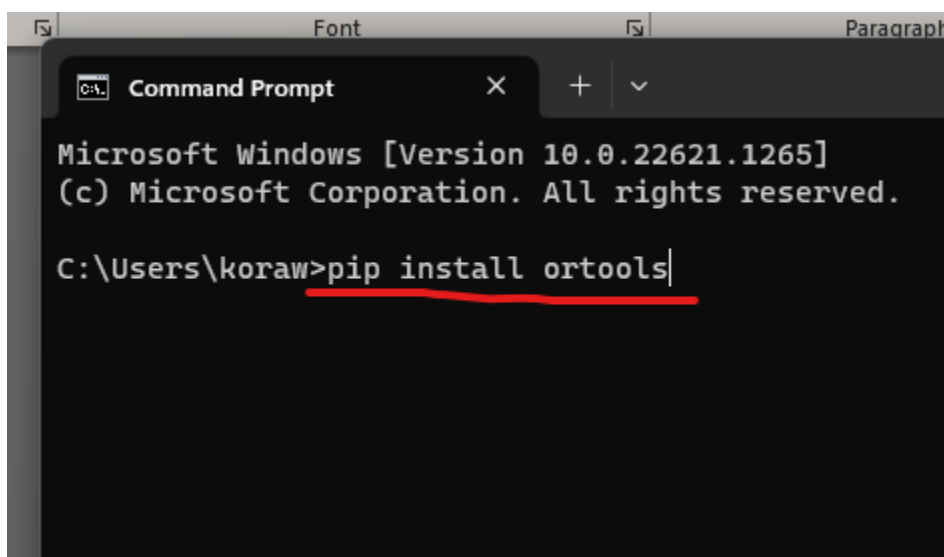
Want to help test development versions of Python? [Prereleases](#), [Docker images](#)

3. Install Library

3.1 เปิด Command Prompt



3.2 ลง Library OR-Tools พิมพ์ pip install ortools



3.3 ลง Library numpy พิมพ์ pip install numpy

```
C:\Users\koraw>pip install numpy|
```

3.4 ลง Library pandas พิมพ์ pip install pandas

```
C:\Users\koraw>pip install pandas|
```

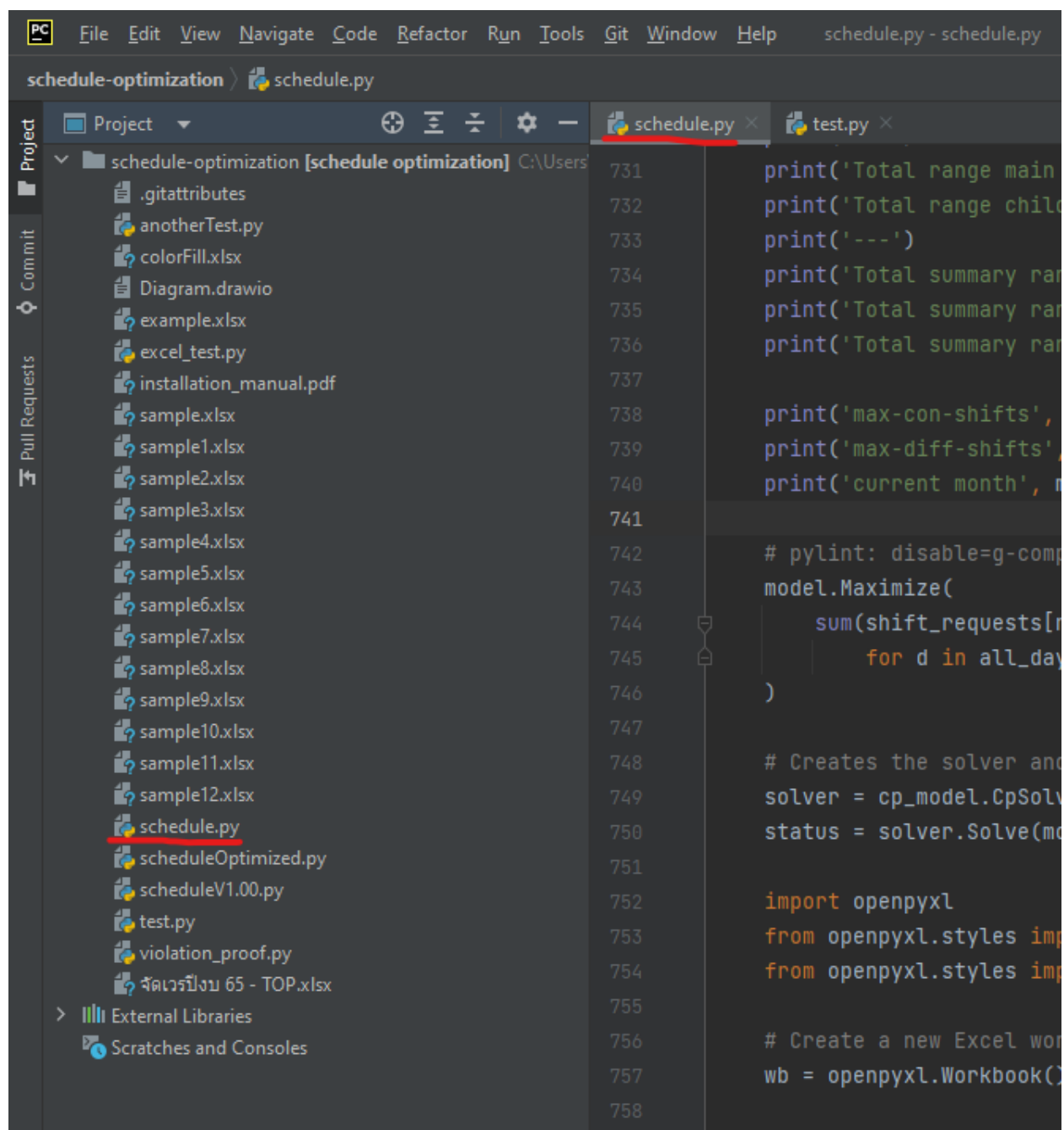
3.5 ลง Library pandas พิมพ์ pip install openpyxl

```
Command Prompt
Microsoft Windows [Version 10.0.22621.1265]
(c) Microsoft Corporation. All rights reserved.

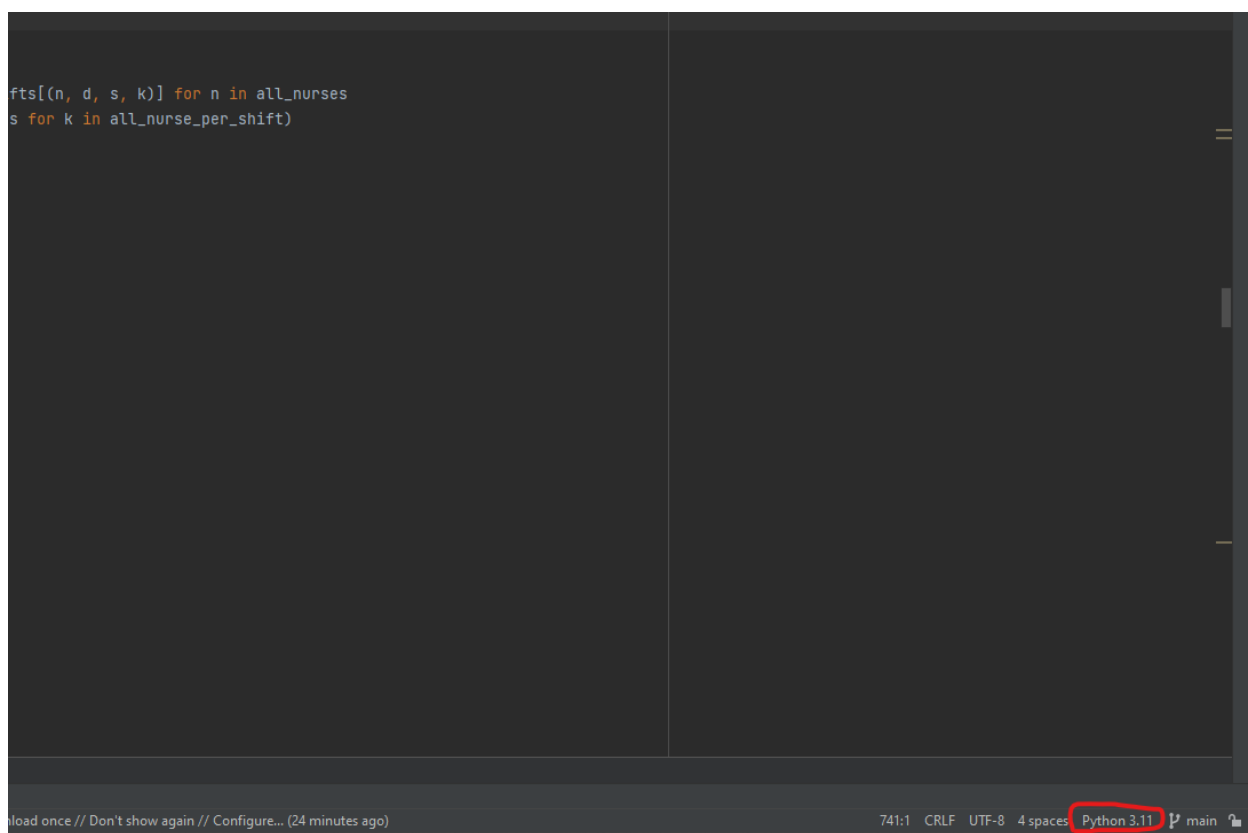
C:\Users\koraw>pip install openpyxl|
```

4. ลง Library ใน pycharm

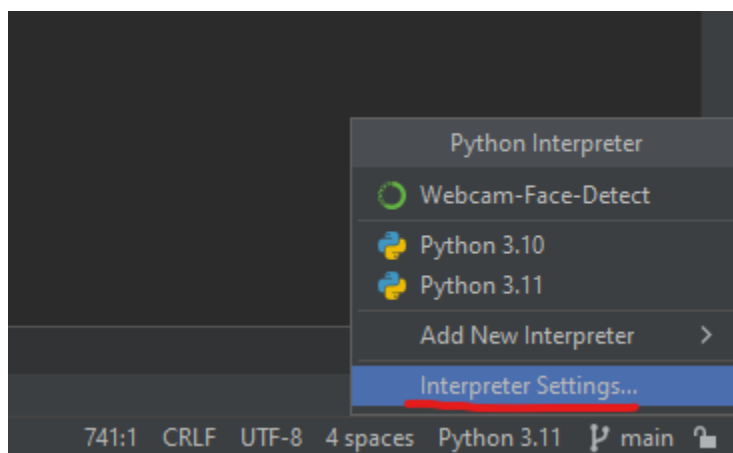
4.1 เปิดไฟล์ schedule.py ดาวน์โหลดได้จาก [xuvu/schedule-optimization \(github.com\)](https://github.com/xuvu/schedule-optimization)



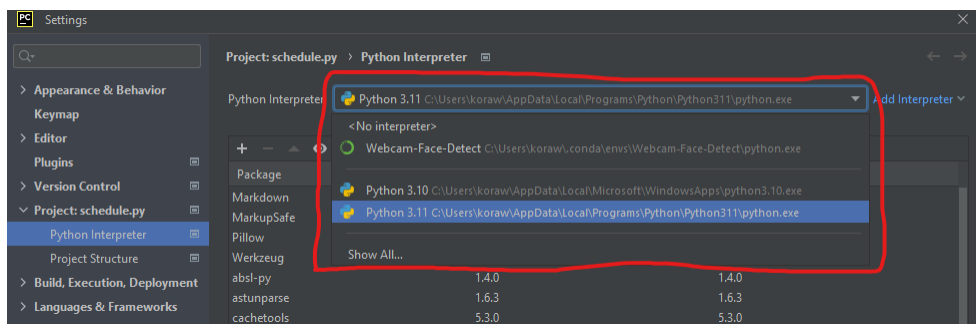
4.2 บริเวณขวาล่างของโปรแกรม **pycharm** คลิกบริเวณกรอบสีแดงดังภาพ



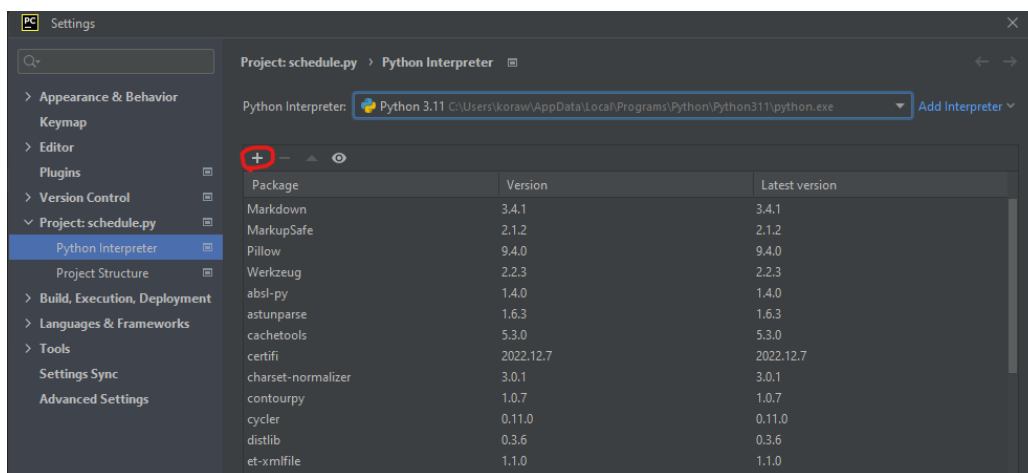
4.3 เลือก Interpreter Settings...



4.4 เลือก environment ของ python ที่ต้องการลง library



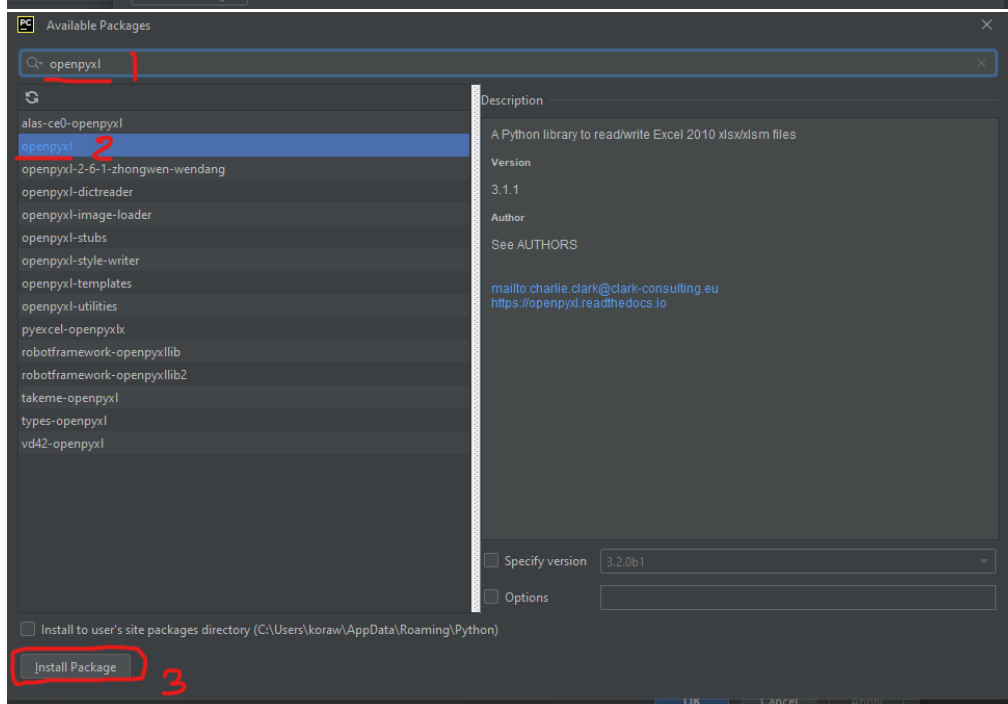
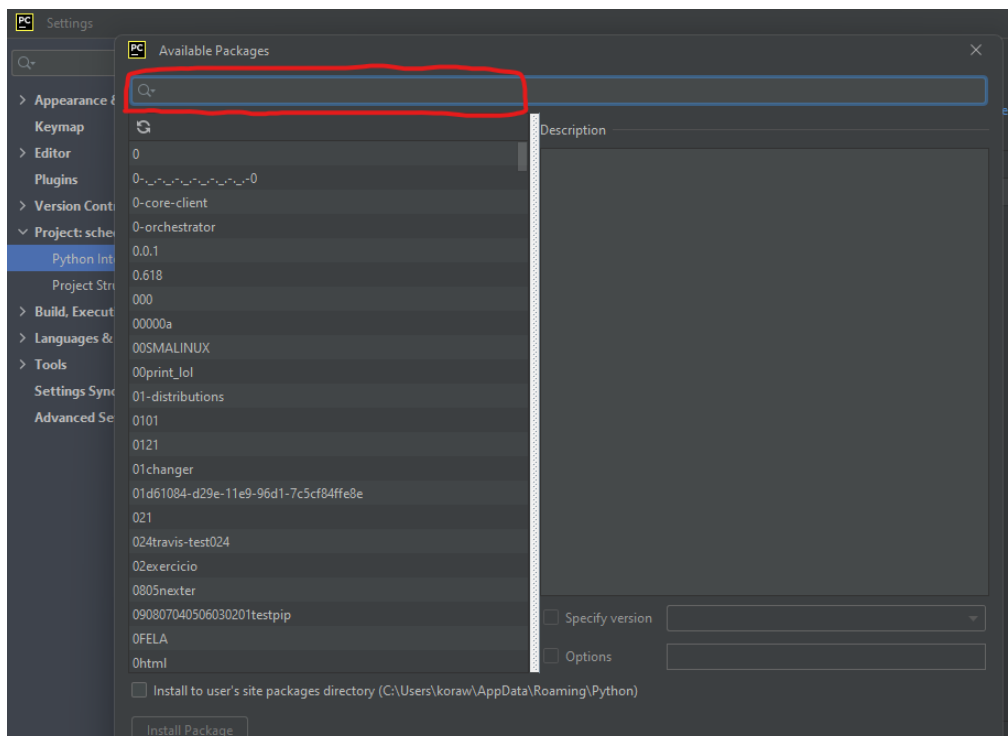
4.5 คลิกเครื่องหมาย + ดังภาพ



4.6 ค้นหาชื่อ Library ตามชื่อ ดังนี้

- 1) ortools
- 2) numpy
- 3) pandas
- 4) openpyxl

ทำการติดตั้ง Library ทั้งหมด



Reference

https://developers.google.com/optimization/scheduling/employee_scheduling

<https://www.coursera.org/learn/operations-research-modeling/home>

<https://www.coursera.org/learn/operations-research-modeling/home/week/1>

<https://www.coursera.org/learn/operations-research-modeling/home/week/2>

```
# example
model.Add(shifts[(0, 2, 1, 0)] == 1)
model.Add(shifts[(0, 2, 1, 0)] <= shifts[(0, 2, 2, 0)])
```