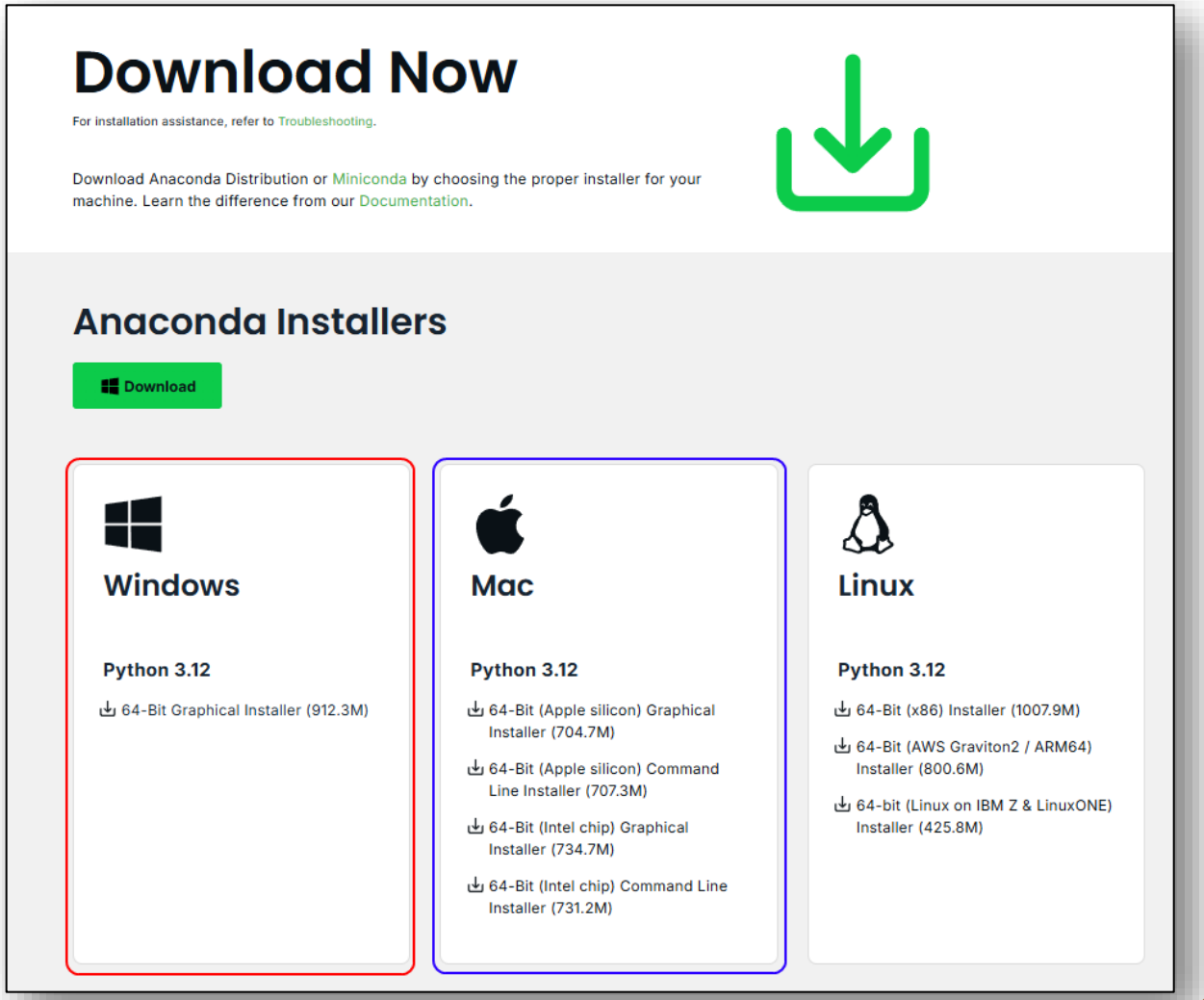
Python
輸入輸出與變數

賴璉錡
lclai.t11@o365.fcu.edu.tw

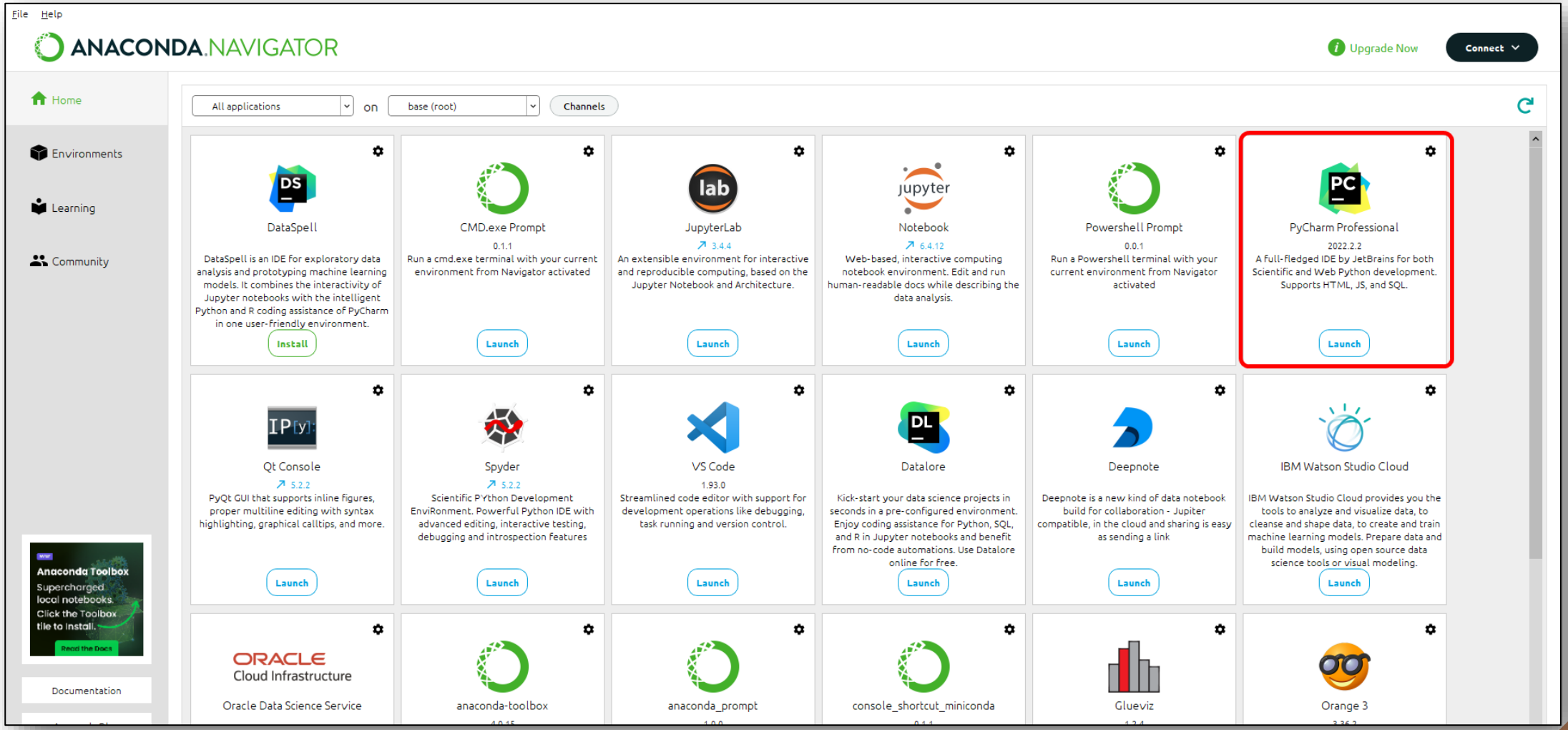
安裝 Python 執行環境與編輯器

Anaconda

https://www.anaconda.com/download/success

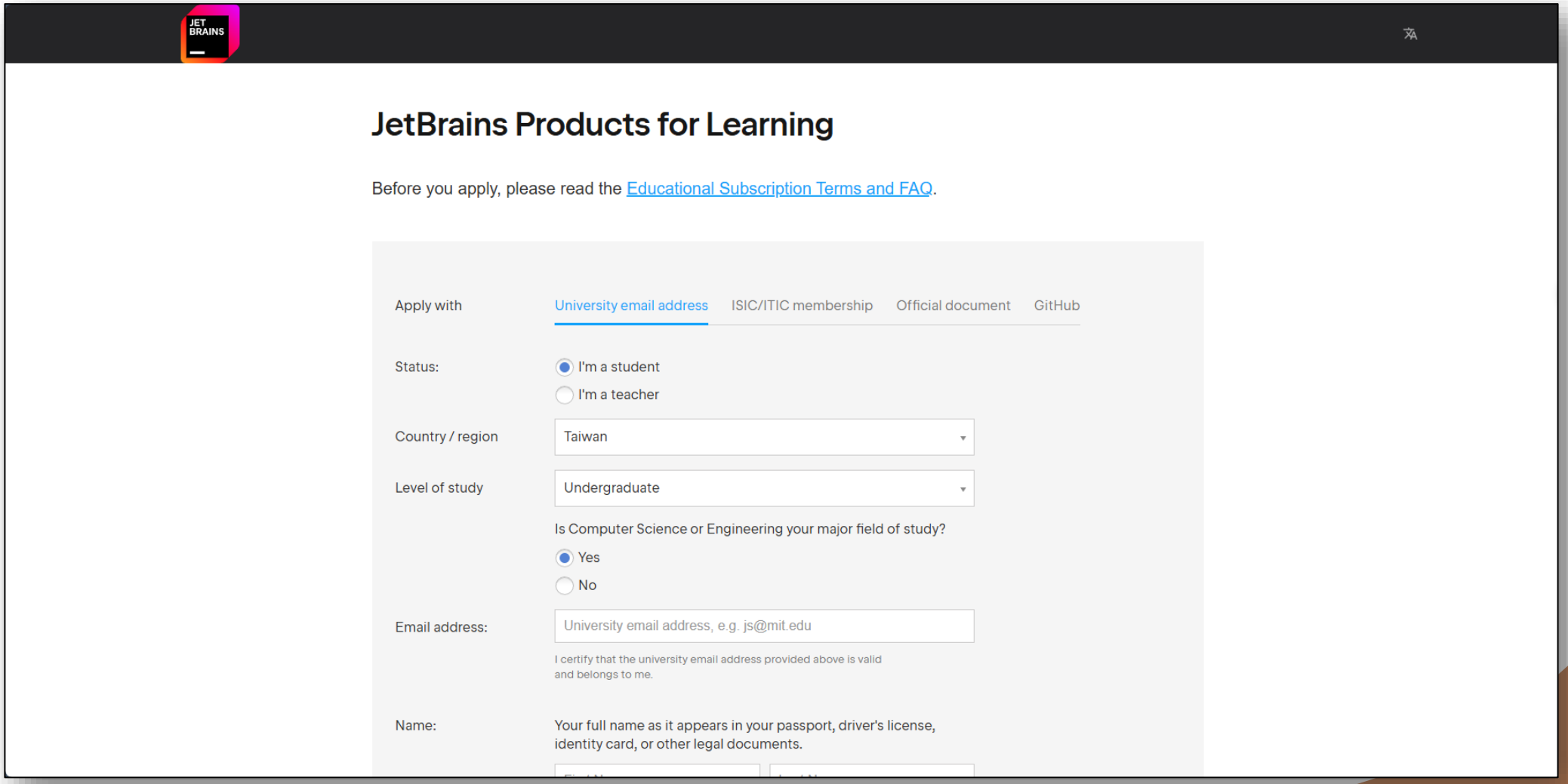


Anaconda Navigator & PyCharm

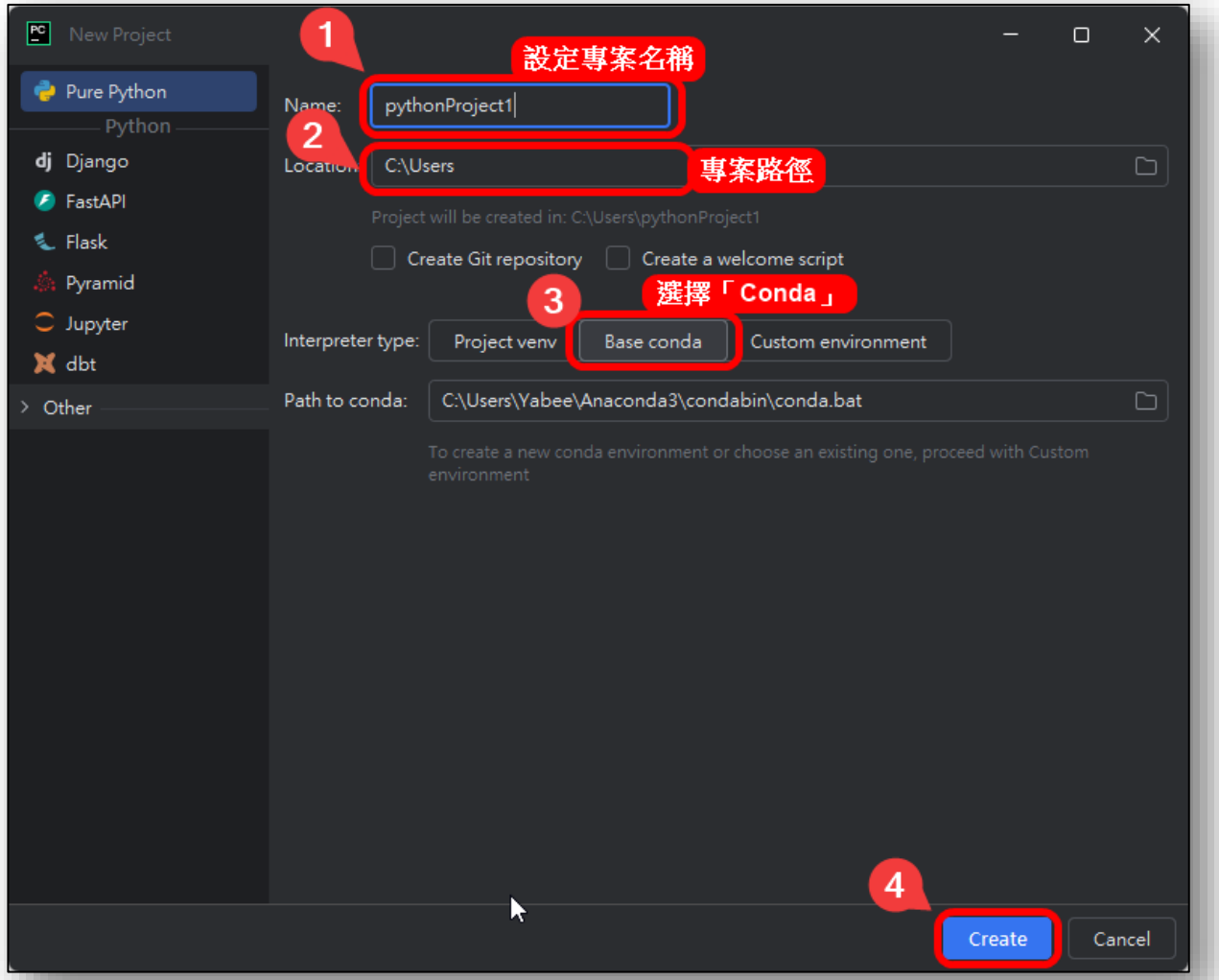


JetBrains Products for Learning

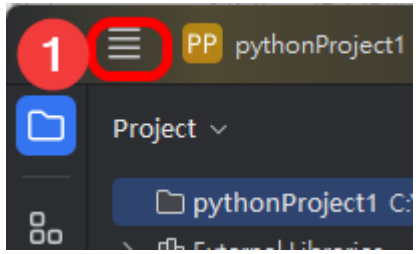
- JetBrains Products for Learning

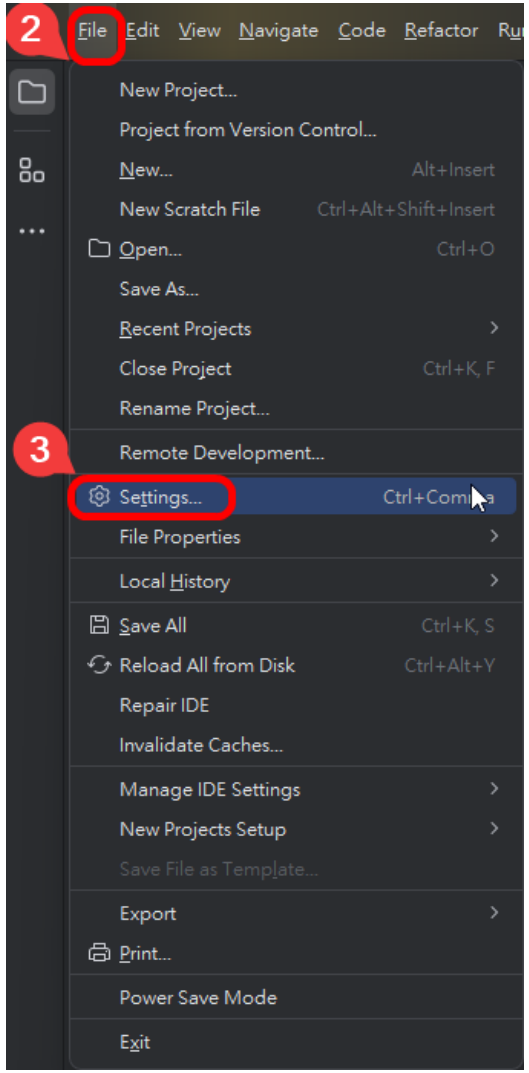


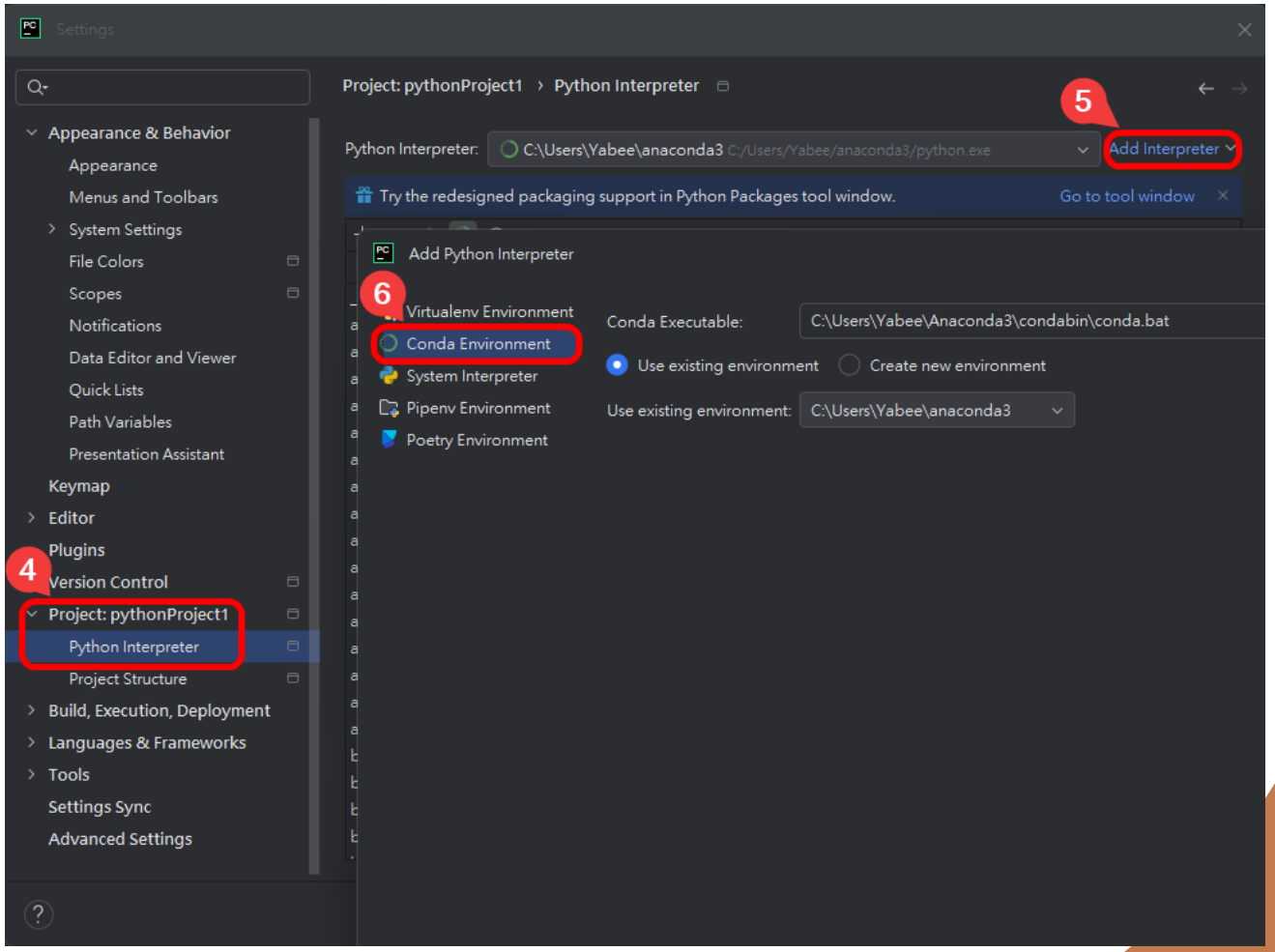
新增 Python 專案


New Project
Pure Python
Python
Django
FastAPI
Flask
Pyramid
Jupyter
dbt
Other
1
設定專案名稱
Name:
pythonProject1
2
Location
C:\Users
專案路徑
Project will be created in: C:\Users\pythonProject1
Create Git repository
Create a welcome script
3
選擇「Conda」
Interpreter type:
Project venv
Base conda
Custom environment
Path to conda:
C:\Users\Yabee\Anaconda3\condabin\conda.bat
To create a new conda environment or choose an existing one, proceed with Custom environment
4
Create
Cancel

Python 專案環境設定







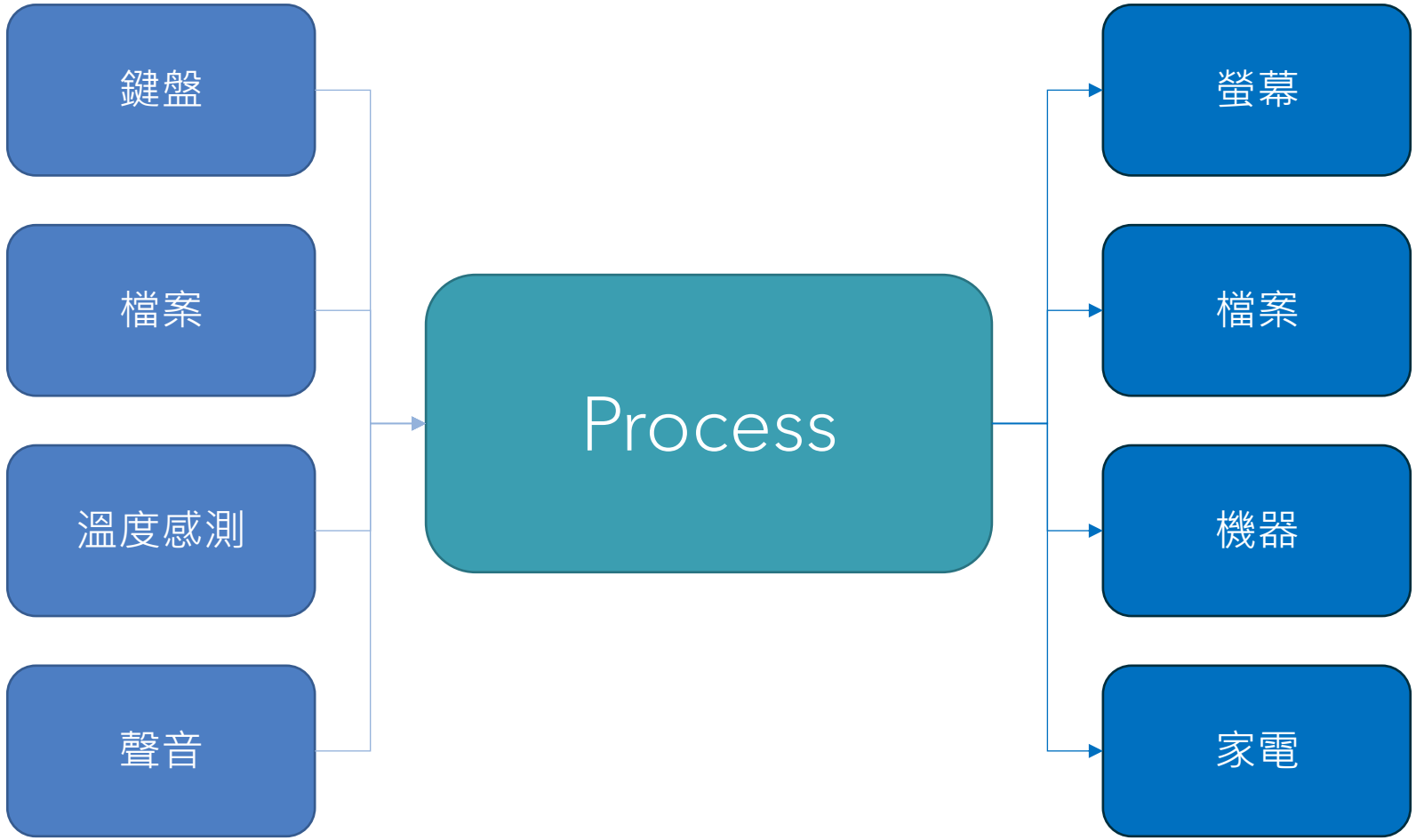
程式的基本結構

程式能做什麼呢?

- 運算:+ - * /
  - **演算:排序、導航、人工智慧...**
- 有值才能運算 (input)
- 運算後一定要輸出 (output) 才有意義

從整體的角度來看，程式由輸入、運算、輸出所構成

Input, Process, Output



Input, Process, Output

input

```
eng = int(input("請輸入英文成績"))
math = int(input("請輸入數學成績"))
```

Process

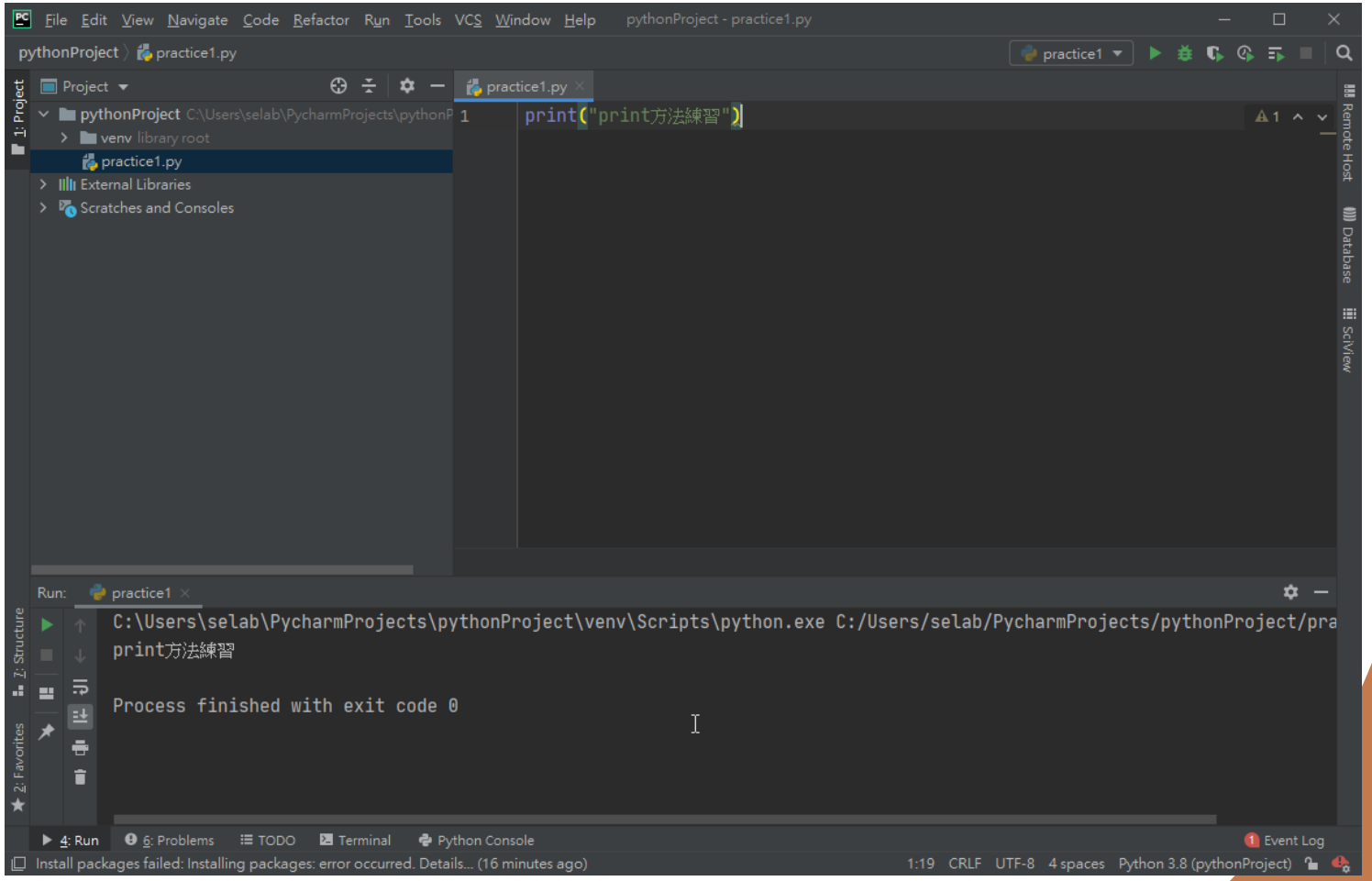
```
average = (eng + math) / 2
```

output

```
print("平均分數為:", average)
```

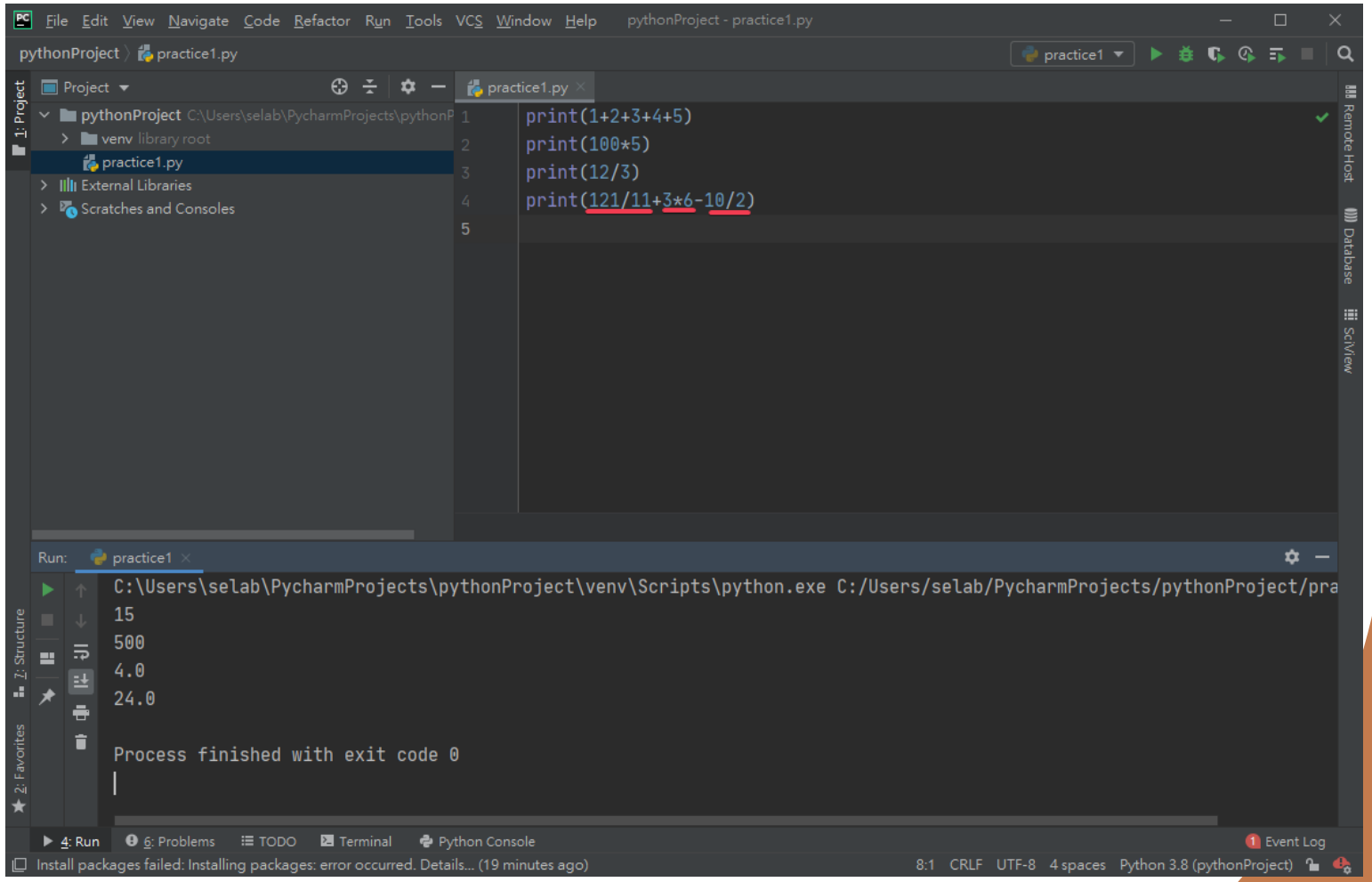
Practice: Output

- print()
  - Python中用來輸出內容到畫面上的方法
- 在PyCharm新增一個practice1.py檔案
- 輸入如右圖程式碼



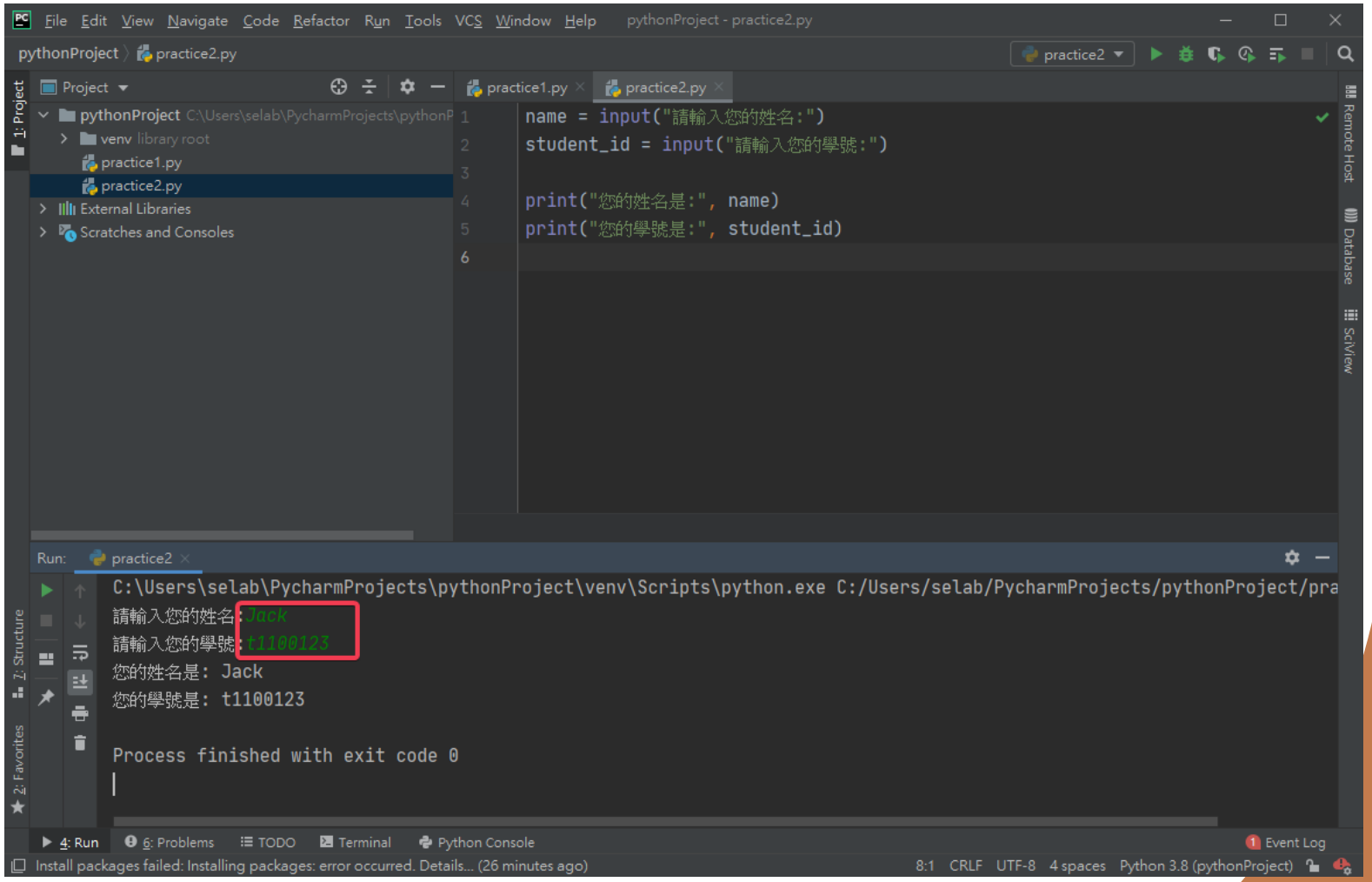
Practice: Process

- 四則運算： +, -, *, /
  - **數字運算中最常被使用的運算子**
- 修改practice1.py，輸入右圖程式碼



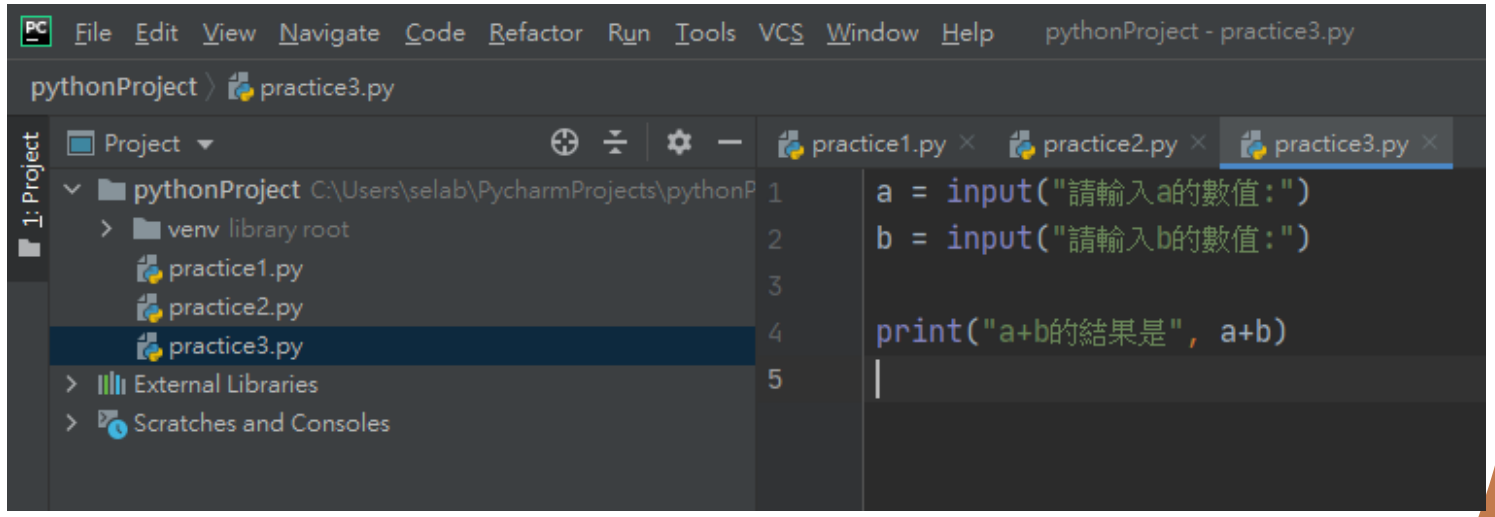
Practice: Input

- input()
  - Python中可以讓使用者輸入內容的一個方法
  - 使用者輸入的內容均視為字串
- 在PyCharm新增一個practice2.py檔案，並輸入右圖之程式碼
- 在輸出結果的視窗中輸入姓名與學號

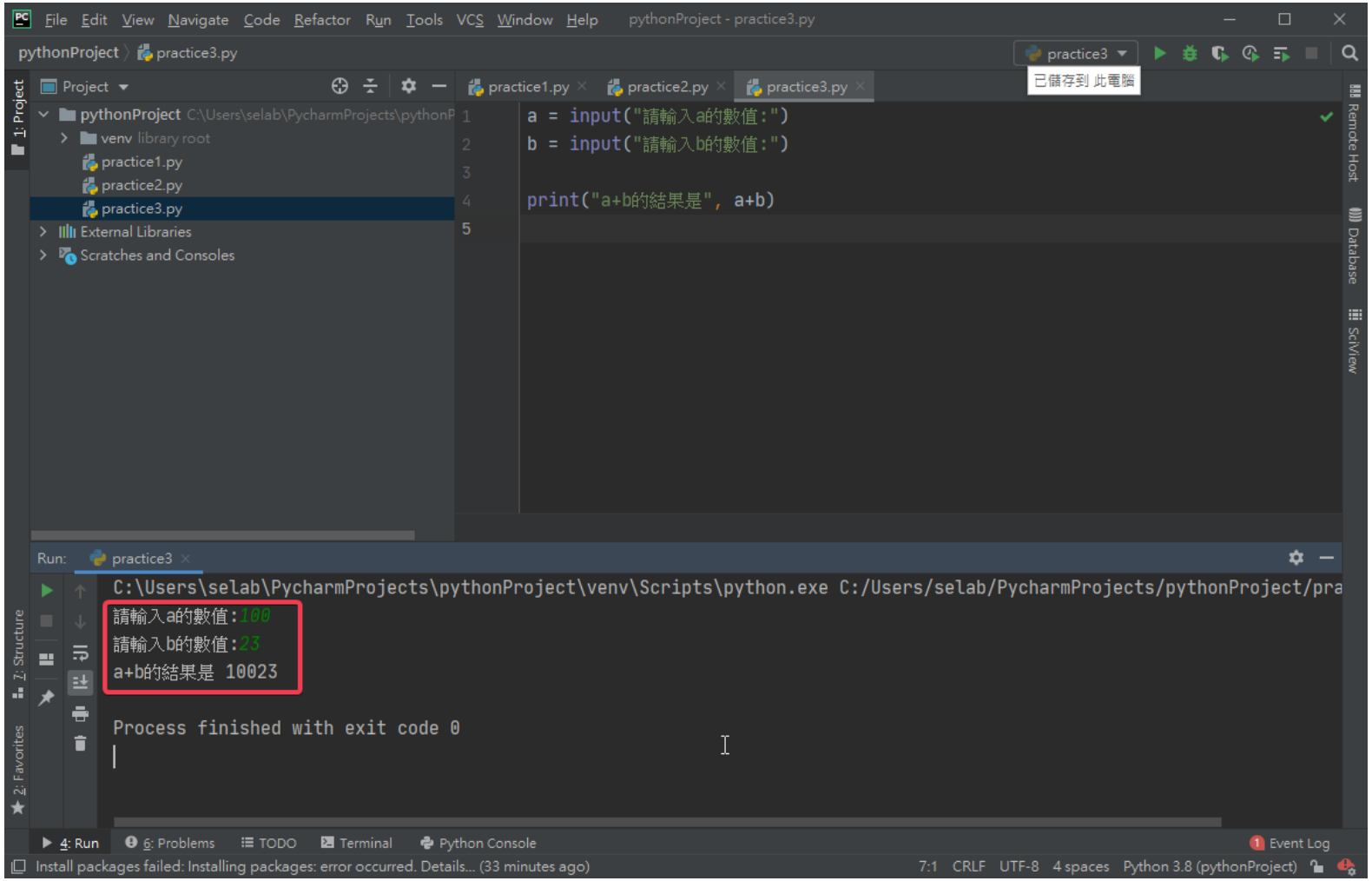


Practice: Input+Process+Output

- 撰寫一個兩數相加的程式
- 新增practice3.py
- 讓使用者分別輸入兩個數a,b，計算相加的值後印出結果



100 + 23 = 10023?


File Edit View Navigate Code Refactor Run Tools VCS Window Help
pythonProject - practice3.py
pythonProject practice3.py
practice3
已儲存到 此電腦
Project
pythonProject C:\Users\selab\PycharmProjects\pythonP
venv library root
practice1.py
practice2.py
practice3.py
External Libraries
Scratches and Consoles
practice1.py practice2.py practice3.py
a = input("請輸入a的數值:")
b = input("請輸入b的數值:")
print("a+b的結果是", a+b)
Run: practice3
C:\Users\selab\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/selab/PycharmProjects/pythonProject/pra
請輸入a的數值:100
請輸入b的數值:23
a+b的結果是 10023
Process finished with exit code 0
4: Run 6: Problems TODO Terminal Python Console
Event Log
Install packages failed: Installing packages: error occurred. Details... (33 minutes ago)
7:1 CRLF UTF-8 4 spaces Python 3.8 (pythonProject)

變數

- 用來儲存特定型態的值
- 變數在 Python 中不需要事先指名型態，但每個變數會根據儲存的數值來改變型態
- 使用type(變數)方法可以顯示變數的型態

```
a = 100      # int:整數(integer)
b = 8.5      # float:浮點數
c = "Apple" # str:字串(string)
d = True     # bool:布林值(boolean)
e = False    # bool:布林值(boolean)
```

```
>>> type(a)
<class 'int'>
>>> type(b)
<class 'float'>
>>> type(c)
<class 'str'>
>>> type(d)
<class 'bool'>
>>> type(e)
<class 'bool'>
```

```
# 有意義的命名
grade = 100
temperature = 8.5
fruit = "Apple"
isTeacher = True
selled = False
```

變數的型態

```
>>> a = 1
... b = 2
... print(a+b)
...
... c = "1"
... d = "2"
... print(c+d)
...
3
12
```

變數型態不同，執行結果也不同!

```
>>> fruit1 = "apple"
... fruit2 = "orange"
... print(fruit1 + fruit2)
... print(fruit1 / fruit2)
...
appleorange
Traceback (most recent call last):
  File "<input>", line 4, in <module>
TypeError: unsupported operand type(s) for /: 'str' and 'str'
```

變數型態轉換

- 可以透過變數型態的方法強制轉換變數的型態

```python
a = '10'
print("a轉變型態之前的數值是:", a)
print("a轉變型態之前的型態是:", type(a))

a = int(a)
print("a轉變型態之後的數值是:", a)
print("a轉變型態之後的型態是:", type(a))
```

```
a轉變型態之前的數值是: 10
a轉變型態之前的型態是: <class 'str'>
a轉變型態之後的數值是: 10
a轉變型態之後的型態是: <class 'int'>
```

```python
a = 'abc'
print("a轉變型態之前的數值是:", a)
print("a轉變型態之前的型態是:", type(a))

a = int(a)
print("a轉變型態之後的數值是:", a)
print("a轉變型態之後的型態是:", type(a))
```

```
a轉變型態之前的數值是: abc
a轉變型態之前的型態是: <class 'str'>
Traceback (most recent call last):
  File "C:/Users/selab/PycharmProjects/pythonProject/example4.py", line 5, in <module>
    a = int(a)
ValueError: invalid literal for int() with base 10: 'abc'
```

Practice: 變數轉換型態

- 修改practice3.py的程式碼使其能正確執行
- 先看看使用者透過input方法輸入進來的變數型態
- 再將a、b兩個變數的型態轉換成整數型態

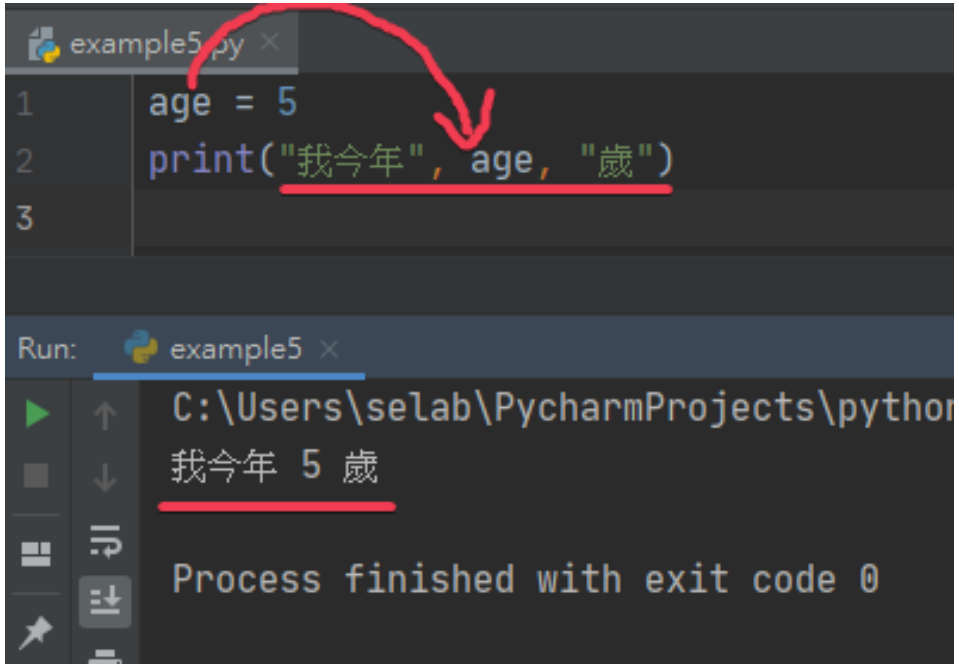
```python
a = input("請輸入a的數值:")
b = input("請輸入b的數值:")

print("a的型態:", type(a))
print("b的型態:", type(b))

print("a+b的結果是", a+b)
```

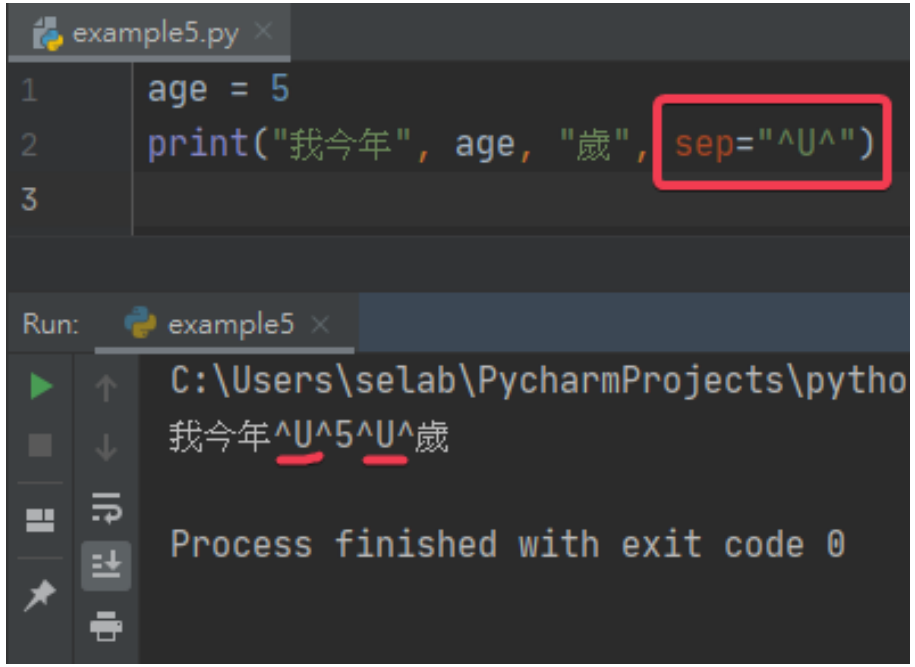
```
請輸入a的數值:100
請輸入b的數值:23
a的型態: <class 'str'>
b的型態: <class 'str'>
a+b的結果是 10023
```

```python
a = input("請輸入a的數值:")
b = input("請輸入b的數值:")

print("a的型態:", type(a))
print("b的型態:", type(b))

a = int(a)
b = int(b)
print("轉換後a的型態:", type(a))
print("轉換後b的型態:", type(b))

print("a+b的結果是", a+b)
```

```
請輸入a的數值:100
請輸入b的數值:23
a的型態: <class 'str'>
b的型態: <class 'str'>
轉換後a的型態: <class 'int'>
轉換後b的型態: <class 'int'>
a+b的結果是 123
```

關於print()





如果沒有特別設定sep，預設會以1個空格連接

關於print()

example5.py

```python
age = 5
work_year = 20
print("我今年", age, "歲")
print("我有", work_year, "年工作經驗")
```

Run: example5

```
C:\Users\selab\PycharmProjects\pythonP
我今年 5 歲
我有 20 年工作經驗

Process finished with exit code 0
```

example5.py

```python
age = 5
work_year = 20
print("我今年", age, "歲", sep='*')
print("我有", work_year, "年工作經驗", sep='#')
```

Run: example5

```
C:\Users\selab\PycharmProjects\pythonProject\
我今年*5*歲
我有#20#年工作經驗

Process finished with exit code 0
```

關於print()

example5.py

```
1  age = 5
2  work_year = 20
3  print("我今年", age, "歲", sep='*')
4  print("我有", work_year, "年工作經驗", sep='#')
5
```

Run: example5

```
C:\Users\selab\PycharmProjects\pythonProject\
我今年*5*歲
我有#20#年工作經驗

Process finished with exit code 0
```

example5.py

```
1  age = 5
2  work_year = 20
3  print("我今年", age, "歲", sep='*', end=',')
4  print("我有", work_year, "年工作經驗", sep='#')
5
```

Run: example5

```
C:\Users\selab\PycharmProjects\pythonProject\
我今年*5*歲,我有#20#年工作經驗

Process finished with exit code 0
```

如果沒有特別設定end，預設會以\n(換行符號)連接