

Lab144 : SciPy Optimizers

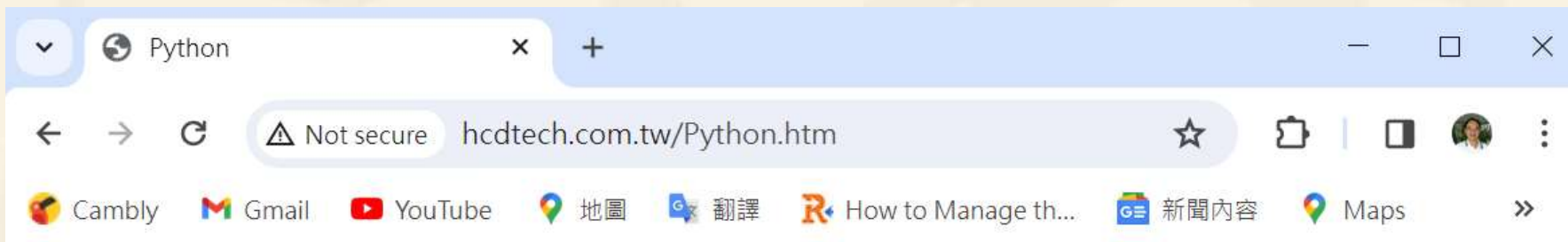
SciPy 優化器

(別怕! 跟著做你就會!)

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請至 www.hcdtech.com.tw 下載教材



<http://www.hcdtech.com.tw/Python.htm>



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所有的考卷都可以考100分，是我們自己錯過了！

學習秘訣=發問+練習

考卷發下去，時間到了收回來，如果沒有考到100分，這很正常。重點來了，不會的可以問，問完了練習，準備好了考卷再發下去。第二次還是沒有考到100分，這也很正常。沒關係，再來一次，不會的可以問，問完了練習，準備好了考卷第三次再發下去，.....，考到第N次如果還是沒有考到100分。沒關係，再來，不會的可以問，問完了練習，N+1次、N+2次、.....，你們都很聰明，知道我在說什麼，到最後考卷一定可以考100分！看懂了妳/你就會知道，原來學習的秘訣就是發問和練習！今天開始不懂就問，問完了練習，明年的妳/你肯定不一樣！

學習如何學習！

1

1 2

1 2 3

.....

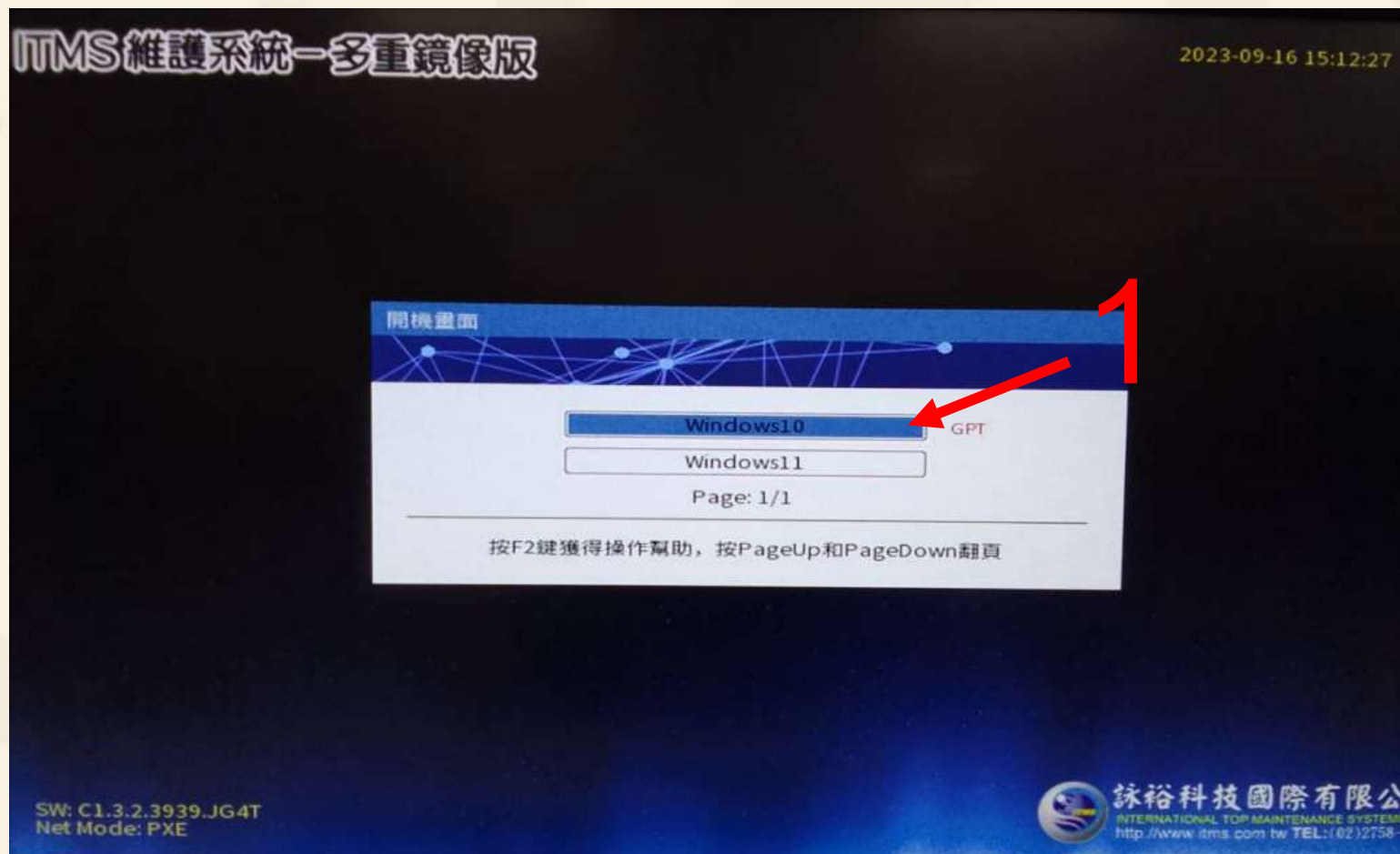
1 2 3 4 5 6 7 8 9 10

金字塔念書法



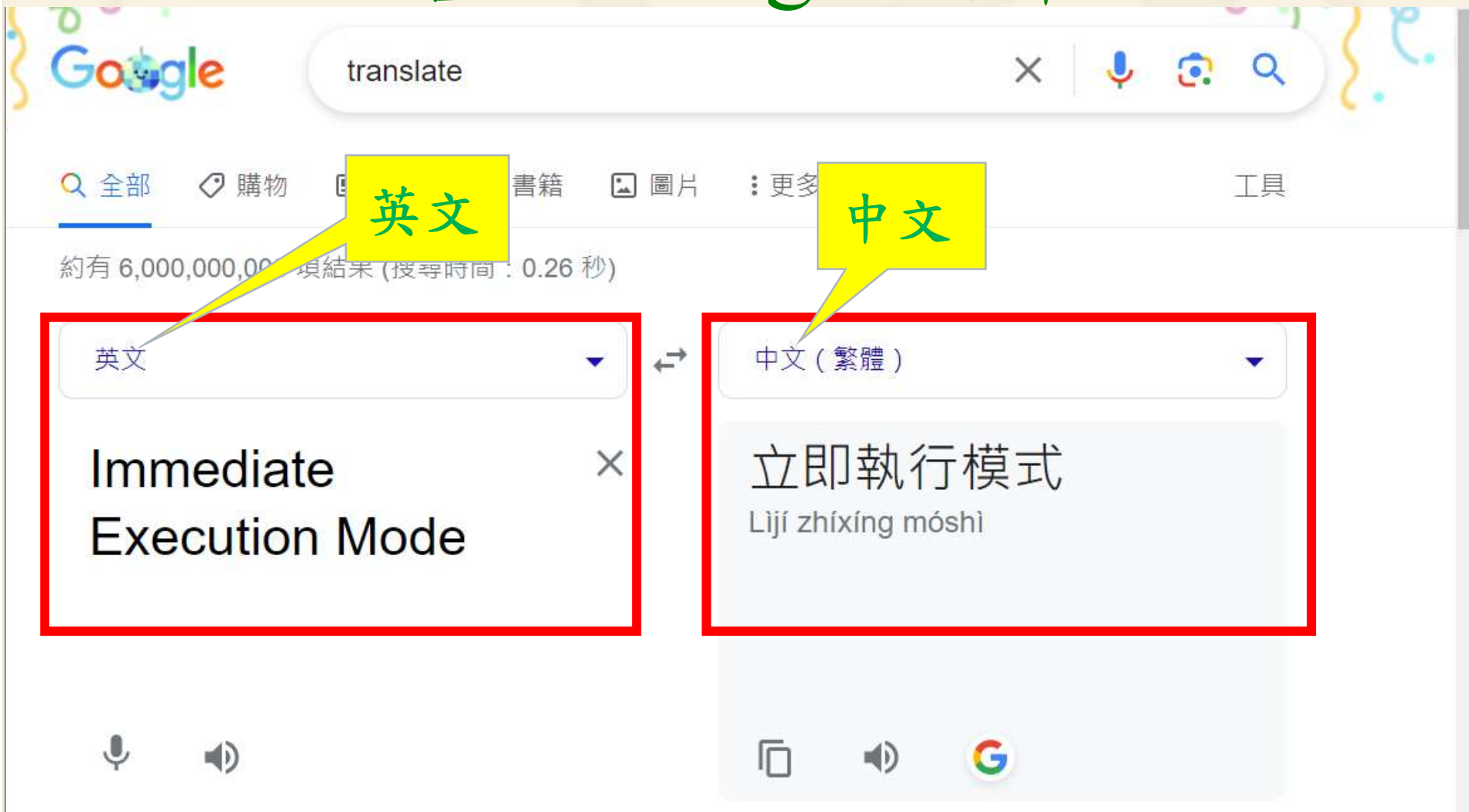
如果一本書有10個章節！先看第1章，在看第2章之前再把第1章看一遍，在看第3章之前再把第1, 2章看一遍，.....，等看到第10章的時候，第1, 2, 3, 4章恐怕已經背起來了！我稱這種念書法為金字塔念書法，今天開始照著做，明年的妳/你肯定不一樣！

請使用 Windows 10



1. 選用 Windows 10.

善用 Google 翻譯

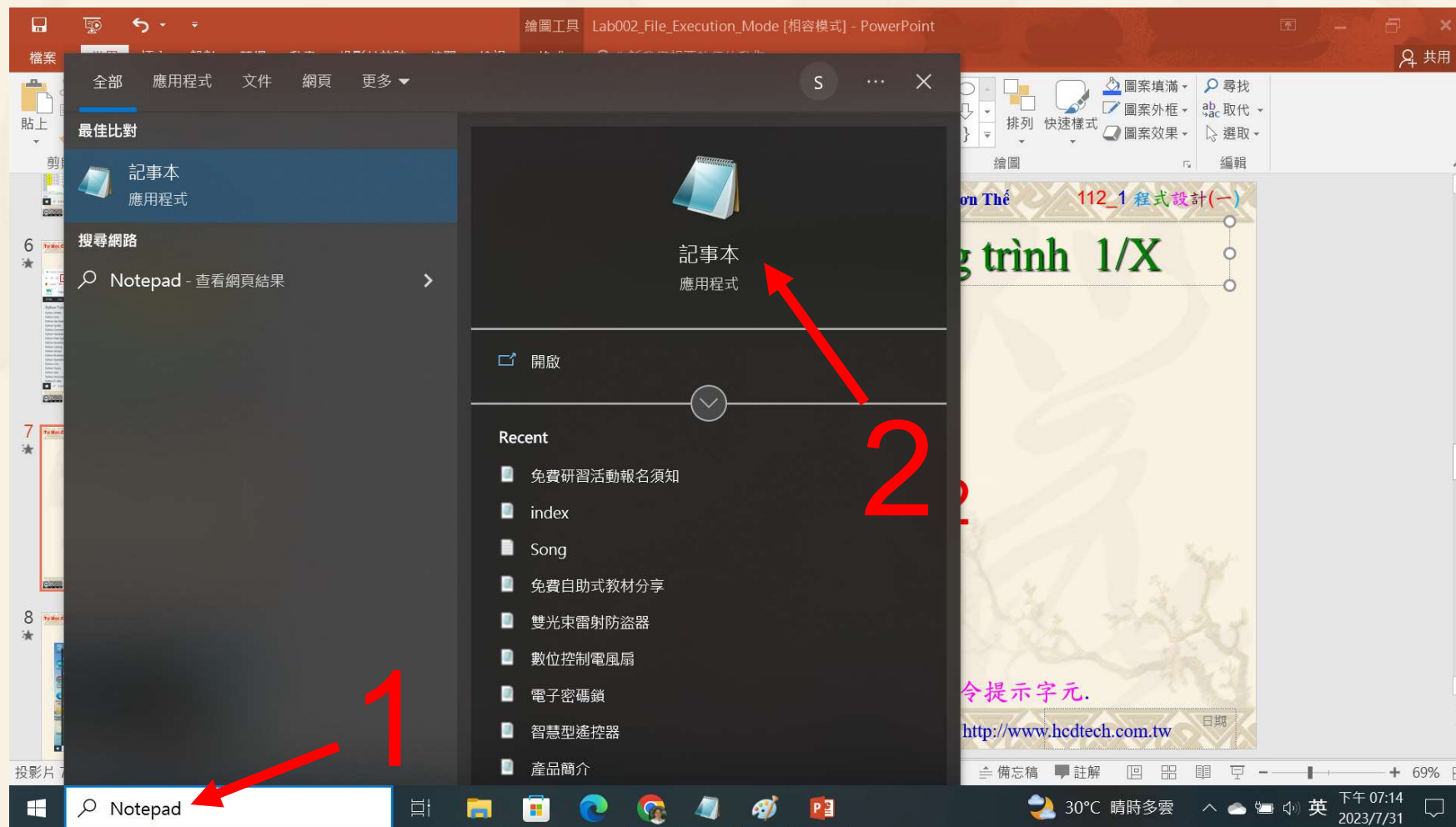


請先開啟網頁閱讀

The screenshot shows a web browser window with the following elements:

- Address Bar:** `w3schools.com/python/scipy/scipy_optimizers.php` (highlighted with a red box).
- Callout:** A yellow box with the text "請用善用 Google 翻譯 讀懂 網頁 內容" pointing to the address bar.
- Page Content:**
 - Navigation menu: CODEJS, R, TYPESCRIPT, ANGULAR, G.
 - Left sidebar: SciPy Tutorial, SciPy Home, SciPy Intro, SciPy Getting Started, SciPy Constants, **SciPy Optimizers**, SciPy Sparse Data, SciPy Graphs, SciPy Spatial Data, SciPy Matlab Arrays, SciPy Interpolation, SciPy Significance Tests, Quiz/Exercises, SciPy Editor, SciPy Quiz, SciPy Exercises.
 - Main content: "SciPy Optimizers" header, "Optimizers in SciPy" section, and "Optimizing Functions" section.
 - Right sidebar: "Build your career. Get Full Access." advertisement with "Start today" button.
- Taskbar:** Windows taskbar at the bottom showing search, icons for various applications, and system tray with date/time (2023/12/22, 11°C).

建立程式文件 1/4



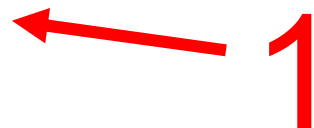
1. 鍵盤輸入Notepad. 2. 用滑鼠點選記事本.

建立程式文件 2/4

```

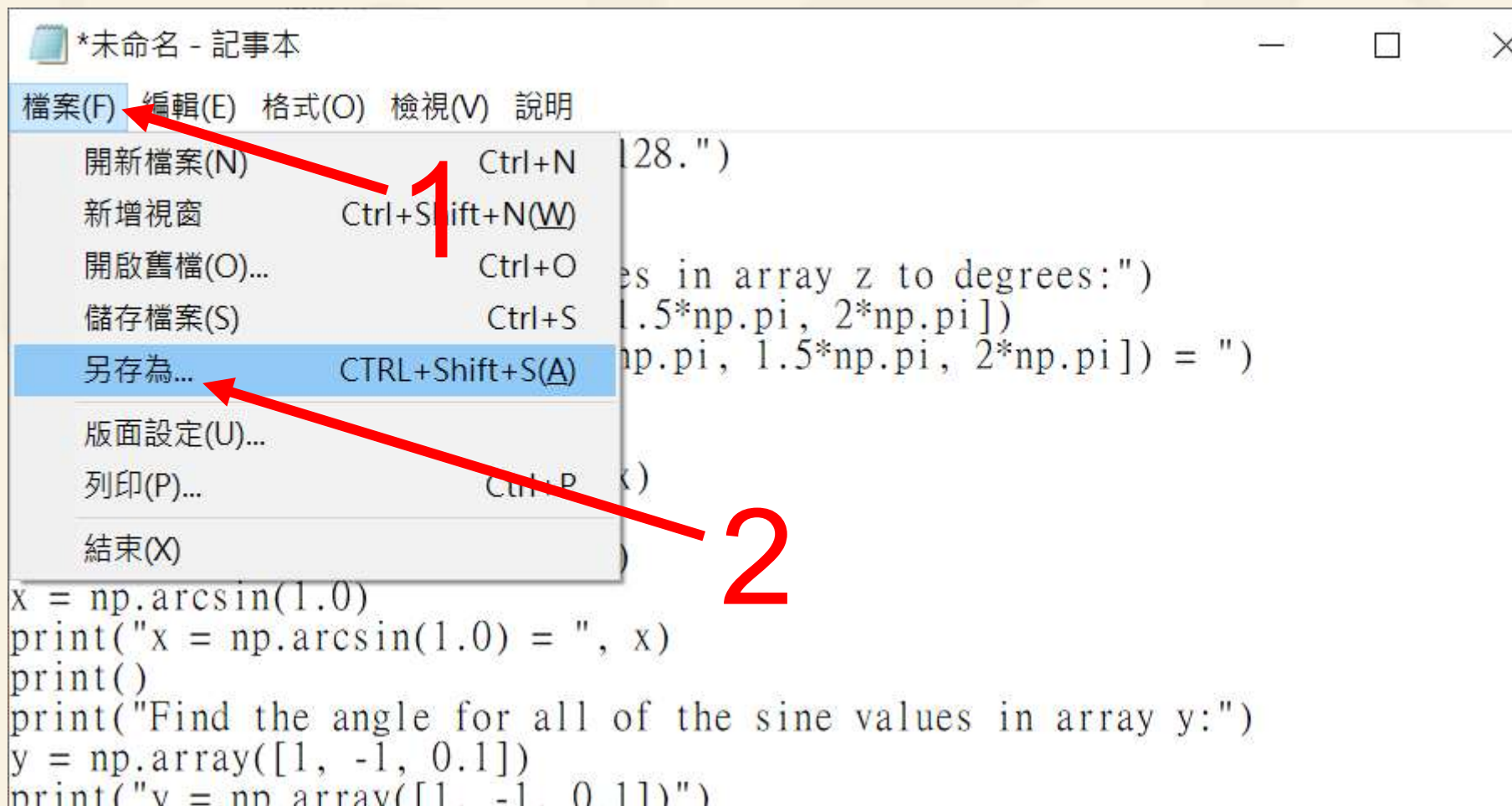
*未命名 - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明
print("P11211XXX practices Lab144.")
from scipy.optimize import root
from math import cos
from scipy.optimize import minimize
print("Find root of the equation x + cos(x):")
def eqn(x):
    return x + cos(x)
myroot = root(eqn, 0)
print(myroot.x)
print()
print("Minimize the function x^2 + x + 2 with BFGS:")
def eqn(x):
    return x**2 + x + 2
mymin = minimize(eqn, 0, method='BFGS')
print(mymin)
    
```

將P11211XXX修改為您的學號



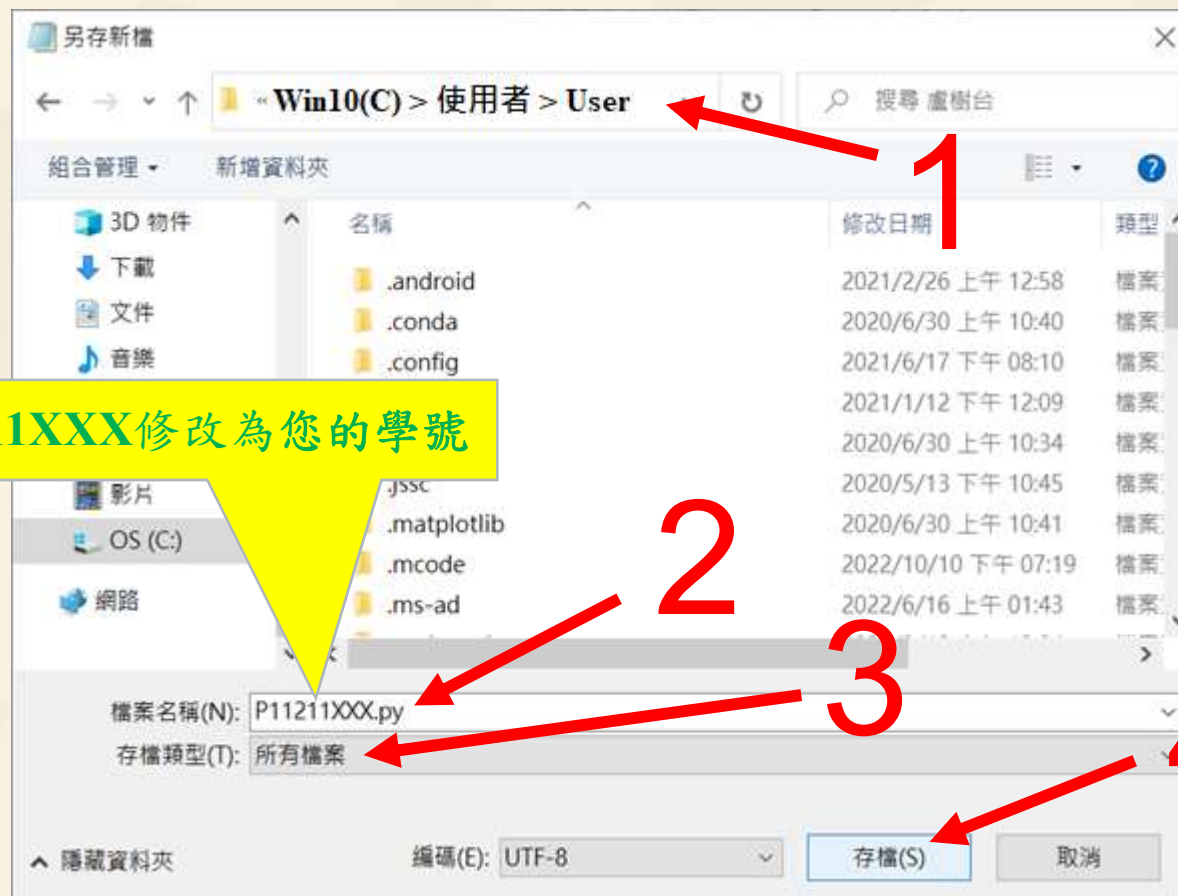
1. 用鍵盤輸入程式代碼.

建立程式文件 3/4



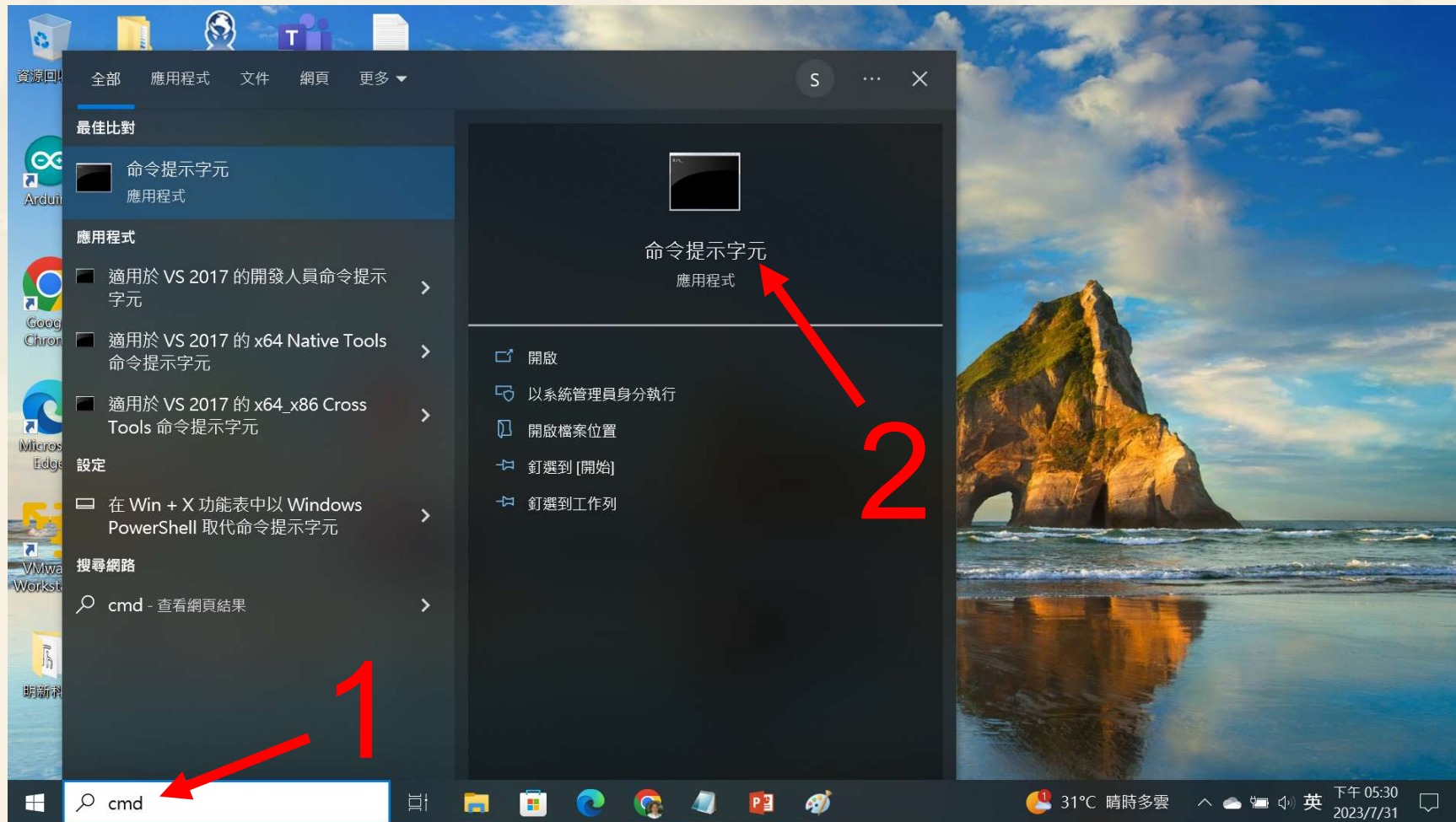
1. 用滑鼠點選檔案. 2. 用滑鼠點選另存為....

建立程式文件 4/4



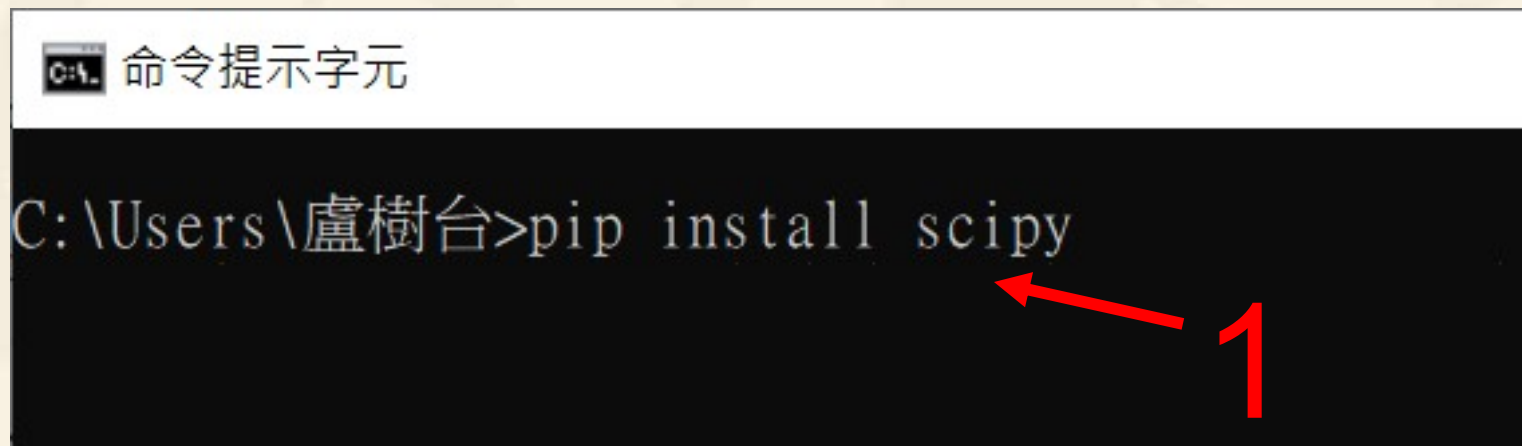
1. 資料夾 = C:\使用者>User>.
2. 檔案名稱 = P11211XXX.py .
3. 存檔類型(T) = 所有檔案.
4. 用滑鼠點選存檔.

檔案執行模式 1/3

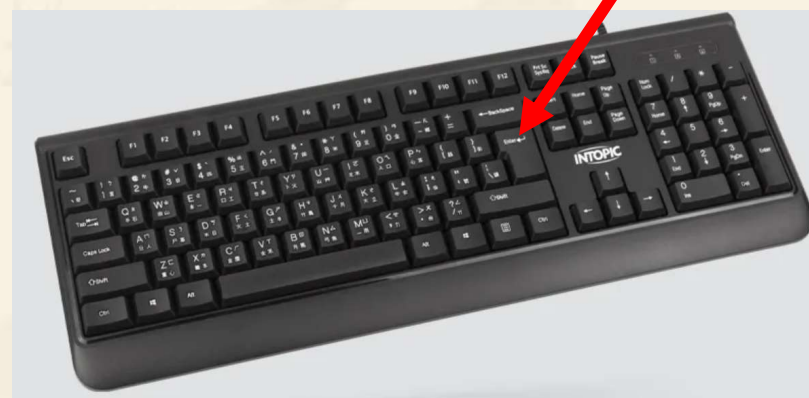


1. 鍵盤輸入cmd.
2. 用滑鼠點選命令提示字元.

檔案執行模式 2/3



```
C:\Users\盧樹台>pip install scipy
```



1. 用鍵盤輸入pip install scipy.
2. 按一下Enter.

檔案執行模式 3/3

```
C:\Users\盧樹台>pip install scipy
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-packages)
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-packages)
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-packages)
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-packages)
Collecting scipy
  Downloading scipy-1.11.4-cp39-cp39-win_amd64.whl (44.3 MB)
    |-----| 44.3 MB 131 kB/s
Requirement already satisfied: numpy<1.28.0,>=1.21.6 in c:\python39\lib\site-packages (from scipy) (1.26.1)
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-packages)
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-packages)
Installing collected packages: scipy
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-packages)
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-packages)
Successfully installed scipy-1.11.4
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-p
WARNING
WARNING
WARNING
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-p
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-pac
WARNING: Ignoring invalid distribution -ip (c:\python39\lib\site-p
WARNING: Ignoring invalid distribution - (c:\python39\lib\site-pac
WARNING: You are using pip version 21.1.1; however, version 23.3.2
You should consider upgrading via the 'c:\python39\python.exe -m p

C:\Users\盧樹台>Python P11211XXX.py
```

將P11211XXX修改為您的學號

1. 用鍵盤輸入Python P11211XXX.py .
2. 按一下Enter.

Verification Criteria of Lab144

(Lab144的驗收規範) SciPy優化器

**P11211XXX 必需
更換為您的學號**

Ask the teacher to give you points after completing the illustrated results.

(完成右圖指定成果後請教師在您的座位驗收並讓您簽名加分)

```
C:\Users\盧樹台>Python P11211XXX.py
P11211XXX practices Lab144.
Find root of the equation x + cos(x):
C:\Users\盧樹台\P11211XXX.py:8: DeprecationWarning: Converting NumPy 1.25.)
    return x + cos(x)
[-0.73908513]

Minimize the function x^2 + x + 2 with BFGS:
message: Optimization terminated successfully.
success: True
status: 0
fun: 1.75
x: [-5.000e-01]
nit: 2
jac: [ 0.000e+00]
hess_inv: [[ 5.000e-01]]
nfev: 8
njev: 4

C:\Users\盧樹台>
```

```
*P11211XXX - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明
print("P11211XXX practices Lab144.")

from scipy.optimize import root
from math import cos
from scipy.optimize import minimize
print("Find root of the equation x + cos(x):")
def eqn(x):
    return x + cos(x)
myroot = root(eqn, 0)
print(myroot.x)
print()
print("Minimize the function x^2 + x + 2 with BFGS:")
def eqn(x):
    return x**2 + x + 2
mymin = minimize(eqn, 0, method='BFGS')
print(mymin)
```

每一個學生都要做Lab144至少一次!

養成良好的工作態度

- 離開實驗室時請整理自己的工作座位，為自己的工作態度加分：
 - (1)滑鼠鍵盤歸位 (2)電腦關機 (3)螢幕關閉電源 (4)椅背靠妥 (5)個人責任區(工作座位及週邊範圍)應整潔，不遺留垃圾紙屑等。

