

通訊網路實驗

Android & Python Programming
Python GUI

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評分標準 & 注意事項

- 出席 30%
- Demo 30%
- 結報 40%
 - e3上有學習單
 - 檔名：學號_姓名_Labx.pdf
 - 交pdf到對應的資料夾中 (期限一週)

課程大綱

- Python GUI Tkinter 介紹
- 登入系統小程序式

Demo項目

- Q1: 登入介面
- Q2: 註冊介面

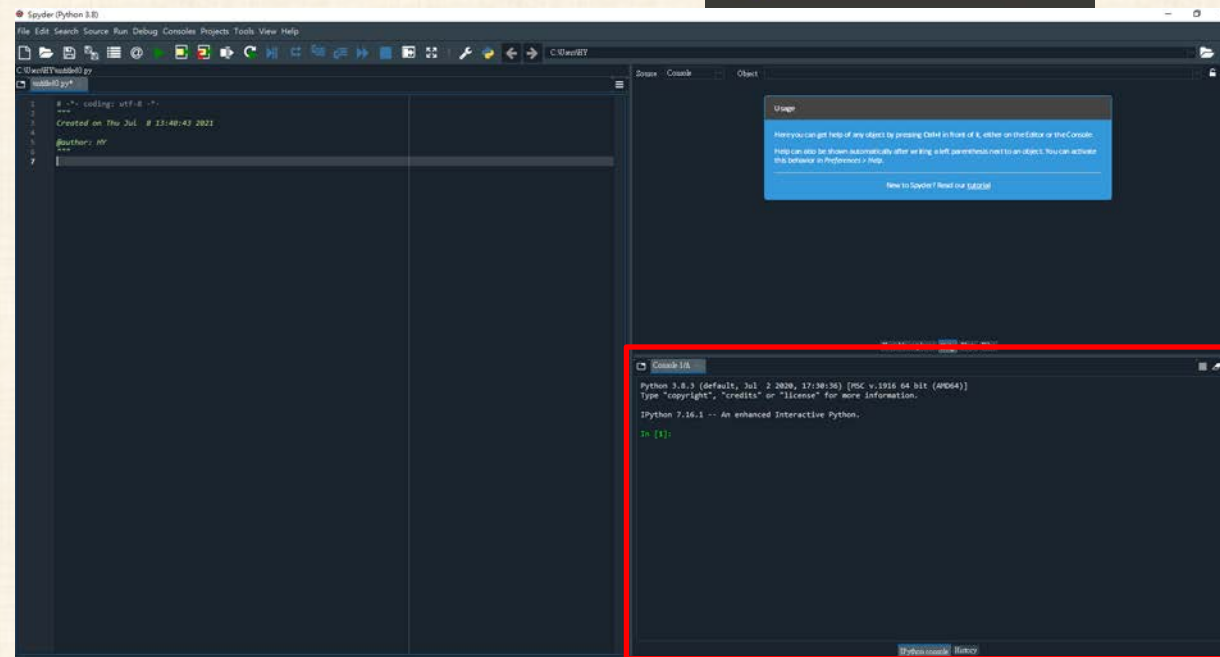
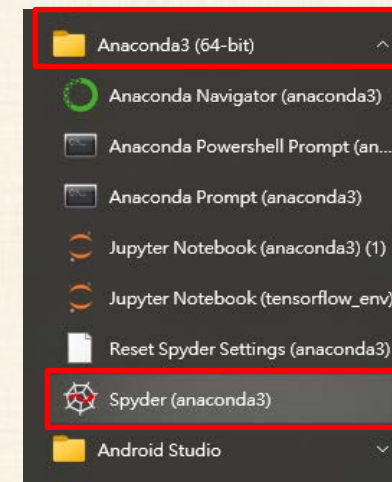
Introduction

□ 開始 > Anaconda3 > Spyder(anaconda3)

□ 綠色箭頭可以debug



□ Console裡面可以顯示變數值、執行結果等



Python GUI Tkinter (1)

- 1. Import tkinter as tk
- 2. 創造tkinter的物件主視窗
 - `window = tk.Tk()`
 - `window.title('Lab5')`
 - `window.geometry('400x400')` 設定視窗大小

Python GUI Tkinter (2)

- 3. 建立主視窗後即可創造其他widget物件，如Button、Label等
 - e.g. `label = tk.Label(window, text='Hello World!')`
主視窗名稱 label顯示的文字
 - e.g. `button = tk.Button(window, text='hit me', command='xxx')`
 - e.g. `frame = tk.Frame(window) #width= , height= , bg=""`
若使用.place()的方式將widget放在視窗上需要加上寬高，否則不一定需要

設定顯示文字

- 設定label顯示的文字：
 - 無法變更文字的寫法： `text = var`
 - 文字隨著變數變動的寫法: `textvariable = var`
 - e.g. `label = tk.Label(window, text=var)`
 - e.g. `label = tk.Label(window, textvariable=var)`

設定Button

- `button = tk.Button(frame, text = "7" , borderwidth=5, width= 4, command = lambda: Click("7"))`
按鈕的邊框寬度按鈕的寬度
- e.g.
 - `command = lambda: Click("7")`
當按下按鈕時傳值'7'給function Click
 - `command = Clear()`

Python GUI Tkinter (3)

- 4. 將widget放在視窗上 e.g. frame.pack()
 - pack() / pack(side='left/right/top/bottom')
 - widget會直接放在視窗上(或指定的方位)
 - grid(column=0, row=1)
 - widget會放在指定的位置(行列)
 - place(x=10, y=30)
 - widget會放在指定的座標

三者不可在同一視窗中混用

Python GUI Tkinter (4)

- 5. 將Tkinter物件放入等待迴圈，讓window不斷重新整理
 - `window.mainloop()`

StringVar()相關用法

- `var = tk.StringVar()`
- `var.set('Python GUI')` 設定`var`字串變數的值
- `x = var.get()` 取得`var`字串變數的值
- `temp = var.get().split(' ')` 將`var`字串變數之中用空白隔開的值分別存入`temp list`物件中

Dictionary (1)

Key	Value
name	John Doe
age	30
email	john.doe@example.com
phone	123-456-7890
address	123 Main St, New York, NY 10001
occupation	Software Engineer
hobbies	Reading, Hiking, Cooking
pets	Two cats, one dog
education	BS in Computer Science, MIT
employment	Senior Software Engineer at Google
marital_status	Single
children	None
languages_spoken	English, Spanish
travel_preferences	Prefers solo travel, likes adventure
favorite_movies	Star Wars, The Godfather, Inception
favorite_music	Rock, Jazz, Classical
favorite_books	1984, The Hobbit, The Great Gatsby
favorite_foods	Pizza, Sushi, Italian
favorite_colors	Blue, Green, Yellow
favorite_numbers	7, 13, 21
favorite_seasons	Spring, Summer
favorite_holidays	Christmas, Halloween
favorite_places	Paris, Rome, Tokyo
favorite_people	Family, Friends, Pets
favorite_quotes	"I am what I eat", "Life is short"
favorite_songs	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_2	Toy Story, The Lion King, The Avengers
favorite_music_2	Pop, Hip-Hop, EDM
favorite_books_2	Harry Potter, The Lord of the Rings
favorite_foods_2	French, Mexican, Asian
favorite_colors_2	Red, Orange, Purple
favorite_numbers_2	4, 8, 16
favorite_seasons_2	Autumn, Winter
favorite_holidays_2	Easter, Thanksgiving
favorite_places_2	London, Sydney, Melbourne
favorite_people_2	Teachers, Mentors, Strangers
favorite_quotes_2	"I have a feeling we're not the only ones here"
favorite_songs_2	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_3	The Matrix, The Terminator, The Matrix
favorite_music_3	Rock, Metal, Punk
favorite_books_3	The Catcher in the Rye, The Great Gatsby
favorite_foods_3	Japanese, Korean, Thai
favorite_colors_3	Black, White, Grey
favorite_numbers_3	3, 6, 9
favorite_seasons_3	Spring, Summer
favorite_holidays_3	Valentine's Day, St. Patrick's Day
favorite_places_3	Barcelona, Amsterdam, Berlin
favorite_people_3	Family, Friends, Pets
favorite_quotes_3	"I am what I eat", "Life is short"
favorite_songs_3	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_4	Toy Story, The Lion King, The Avengers
favorite_music_4	Pop, Hip-Hop, EDM
favorite_books_4	Harry Potter, The Lord of the Rings
favorite_foods_4	French, Mexican, Asian
favorite_colors_4	Red, Orange, Purple
favorite_numbers_4	4, 8, 16
favorite_seasons_4	Autumn, Winter
favorite_holidays_4	Easter, Thanksgiving
favorite_places_4	London, Sydney, Melbourne
favorite_people_4	Family, Friends, Pets
favorite_quotes_4	"I have a feeling we're not the only ones here"
favorite_songs_4	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_5	The Matrix, The Terminator, The Matrix
favorite_music_5	Rock, Metal, Punk
favorite_books_5	The Catcher in the Rye, The Great Gatsby
favorite_foods_5	Japanese, Korean, Thai
favorite_colors_5	Black, White, Grey
favorite_numbers_5	3, 6, 9
favorite_seasons_5	Spring, Summer
favorite_holidays_5	Valentine's Day, St. Patrick's Day
favorite_places_5	Barcelona, Amsterdam, Berlin
favorite_people_5	Family, Friends, Pets
favorite_quotes_5	"I am what I eat", "Life is short"
favorite_songs_5	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_6	Toy Story, The Lion King, The Avengers
favorite_music_6	Pop, Hip-Hop, EDM
favorite_books_6	Harry Potter, The Lord of the Rings
favorite_foods_6	French, Mexican, Asian
favorite_colors_6	Red, Orange, Purple
favorite_numbers_6	4, 8, 16
favorite_seasons_6	Autumn, Winter
favorite_holidays_6	Easter, Thanksgiving
favorite_places_6	London, Sydney, Melbourne
favorite_people_6	Family, Friends, Pets
favorite_quotes_6	"I have a feeling we're not the only ones here"
favorite_songs_6	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_7	The Matrix, The Terminator, The Matrix
favorite_music_7	Rock, Metal, Punk
favorite_books_7	The Catcher in the Rye, The Great Gatsby
favorite_foods_7	Japanese, Korean, Thai
favorite_colors_7	Black, White, Grey
favorite_numbers_7	3, 6, 9
favorite_seasons_7	Spring, Summer
favorite_holidays_7	Valentine's Day, St. Patrick's Day
favorite_places_7	Barcelona, Amsterdam, Berlin
favorite_people_7	Family, Friends, Pets
favorite_quotes_7	"I am what I eat", "Life is short"
favorite_songs_7	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_8	Toy Story, The Lion King, The Avengers
favorite_music_8	Pop, Hip-Hop, EDM
favorite_books_8	Harry Potter, The Lord of the Rings
favorite_foods_8	French, Mexican, Asian
favorite_colors_8	Red, Orange, Purple
favorite_numbers_8	4, 8, 16
favorite_seasons_8	Autumn, Winter
favorite_holidays_8	Easter, Thanksgiving
favorite_places_8	London, Sydney, Melbourne
favorite_people_8	Family, Friends, Pets
favorite_quotes_8	"I have a feeling we're not the only ones here"
favorite_songs_8	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_9	The Matrix, The Terminator, The Matrix
favorite_music_9	Rock, Metal, Punk
favorite_books_9	The Catcher in the Rye, The Great Gatsby
favorite_foods_9	Japanese, Korean, Thai
favorite_colors_9	Black, White, Grey
favorite_numbers_9	3, 6, 9
favorite_seasons_9	Spring, Summer
favorite_holidays_9	Valentine's Day, St. Patrick's Day
favorite_places_9	Barcelona, Amsterdam, Berlin
favorite_people_9	Family, Friends, Pets
favorite_quotes_9	"I am what I eat", "Life is short"
favorite_songs_9	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_10	Toy Story, The Lion King, The Avengers
favorite_music_10	Pop, Hip-Hop, EDM
favorite_books_10	Harry Potter, The Lord of the Rings
favorite_foods_10	French, Mexican, Asian
favorite_colors_10	Red, Orange, Purple
favorite_numbers_10	4, 8, 16
favorite_seasons_10	Autumn, Winter
favorite_holidays_10	Easter, Thanksgiving
favorite_places_10	London, Sydney, Melbourne
favorite_people_10	Family, Friends, Pets
favorite_quotes_10	"I have a feeling we're not the only ones here"
favorite_songs_10	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_11	The Matrix, The Terminator, The Matrix
favorite_music_11	Rock, Metal, Punk
favorite_books_11	The Catcher in the Rye, The Great Gatsby
favorite_foods_11	Japanese, Korean, Thai
favorite_colors_11	Black, White, Grey
favorite_numbers_11	3, 6, 9
favorite_seasons_11	Spring, Summer
favorite_holidays_11	Valentine's Day, St. Patrick's Day
favorite_places_11	Barcelona, Amsterdam, Berlin
favorite_people_11	Family, Friends, Pets
favorite_quotes_11	"I am what I eat", "Life is short"
favorite_songs_11	Billie Jean, Stayin' Alive, Smells Like Teen Spirit
favorite_movies_12	Toy Story, The Lion King, The Avengers
favorite_music_12	Pop, Hip-Hop, EDM
favorite_books_12	Harry Potter, The Lord of the Rings
favorite_foods_12	French, Mexican, Asian
favorite_colors_12	Red, Orange, Purple
favorite_numbers_12	4, 8, 16
favorite_seasons_12	Autumn, Winter
favorite_holidays_12	Easter, Thanksgiving
favorite_places_12	London, Sydney, Melbourne
favorite_people_12	Family, Friends, Pets
favorite_quotes_12	"I have a feeling we're not the only ones here"
favorite_songs_12	Bohemian Rhapsody, Sweet Child O' Mine
favorite_movies_13	The Matrix, The Terminator, The Matrix
favorite_music_13	Rock, Metal, Punk
favorite_books_13	The Catcher in the Rye, The Great Gatsby
favorite_foods_13	Japanese, Korean, Thai
favorite_colors_13	

□ fruit = {'Apple':1, 'Banana':20}

item

- 可變的資料型態
- 沒有順序性，無法使用index查找

Dictionary (2)

- 建立dictionary

- 使用{}建立

- `fruit = {}`

- 使用dict()建立

- `fruit = dict()`

Dictionary (3)

- 使用`keys()`取得所有key
 - `fruit.keys()`回傳 `dict_keys(['Apple', 'Banana'])`
- 使用`values()`取得所有value
 - `fruit.values()`回傳 `dict_values([1, 20])`

Dictionary (4)

- 字典內的元素
 - 使用in檢查key: 'xxx' in yyy
 - e.g. 'Apple' in fruit
 - 使用[]與= 改變or增加 字典內的元素
 - e.g. fruit['Apple']=2 、 fruit['Mango']=10

```
In [43]: fruit
Out[43]: {'Apple': 1, 'Banana': 20}

In [44]: fruit['Apple']=2
In [45]: fruit['Mango']=10

In [46]: fruit
Out[46]: {'Apple': 2, 'Banana': 20, 'Mango': 10}
```


Dictionary (5)

- 字典內的元素
 - 使用[]取得每個key的value

```
In [7]: fruit
Out[7]: {'Apple': 1, 'Banana': 20}

In [8]: fruit['Apple']
Out[8]: 1
```

Pickle (1)

- Python專用不需要下載，但使用前要先`import pickle`
 - 以二進制壓縮、保存資料
 - 提供4個功能：dump, load, dumps, loads
- `pickle.dump(object, file)` 儲存資料
- `pickle.load(file)` 讀取儲存的資料

Pickle (2)

- 將data寫入檔案
 - with open('檔名', 'wb') as f:
 pickle.dump(data, f)

- 讀取檔案中的data
 - with open('檔名', 'rb') as f:
 data = pickle.load(f)

Python Tkinter GUI (5)

- 其他常用的widget，如Entry

- e.g. `entry = tk.Entry(window, textvariable=var, show='*')`

```
import tkinter as tk

window=tk.Tk()
window.title('Lab5')

var = tk.StringVar()

entry = tk.Entry(window, textvariable=var, show='*')
entry.pack()

window.mainloop()
```



- e.g. `usr_name = entry.get()`可以取得在輸入框內輸入的資料

Python GUI Tkinter (6)

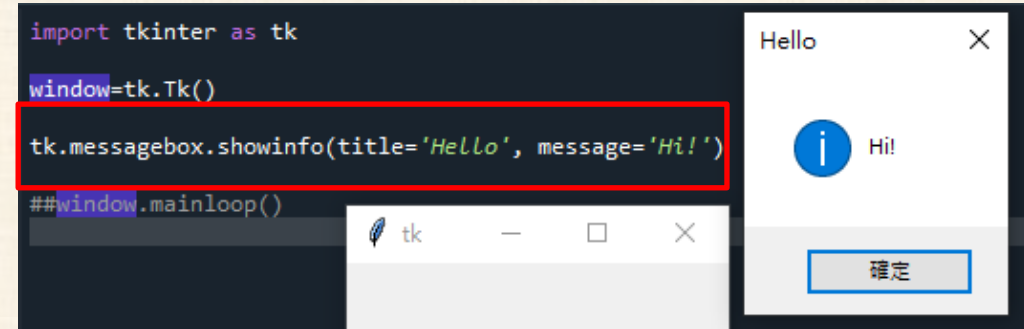
□ 警示視窗(messagebox)

tk.messagebox.showinfo()

tk.messagebox.showwarning()

tk.messagebox.showerror()

tk.messagebox.askyesno() #回傳true或false

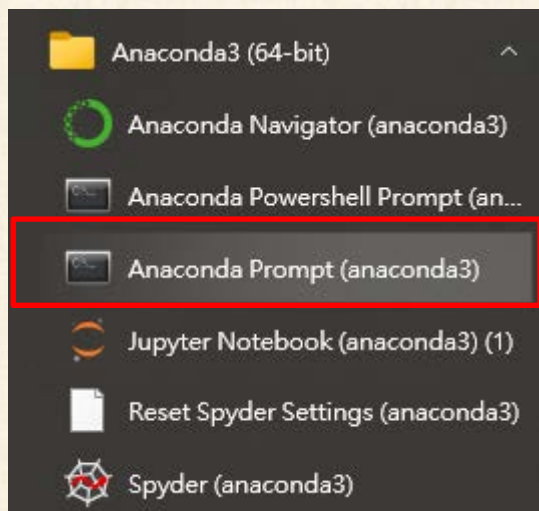


如果有module tkinter has no attribute messagebox錯誤，

在import tkinter as tk 下面新增
from tkinter import messagebox



安裝PIL



```

Anaconda Prompt (anaconda3) - conda install -c anaconda pillow
(base) C:\Users\BUN>conda install -c anaconda pillow
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: C:\Users\BUN\anaconda3

  added / updated specs:
    - pillow

The following packages will be downloaded:

  package | build | size
  -----|-----|-----
  conda-4.10.3 | py38haa95532_0 | 2.9 MB
  -----|-----|-----
                                Total: 2.9 MB

The following packages will be UPDATED:

  conda 4.10.1-py38haa95532_1 --> 4.10.3-py38haa95532_0

Proceed ([y]/n)? 輸入y

Downloading and Extracting Packages
conda-4.10.3 | 2.9 MB | ##### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done

(base) C:\Users\BUN>
  
```

出現表示安裝完成

Q1

- 登入介面分為上下兩個frame

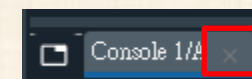
- 上面的frame放圖片

```
from PIL import Image, ImageTk
```

```
image1 = ImageTk.PhotoImage( Image.open('檔名.jpg').resize((寬,高)) )
```


```
im = tk.Label(f1, image=image1)
```

```
im.pack()
```




!如果出現TclError: image “pyimage2” doesn’t exist，把console關掉再執行一次就好

Q1



Wellcome to Login



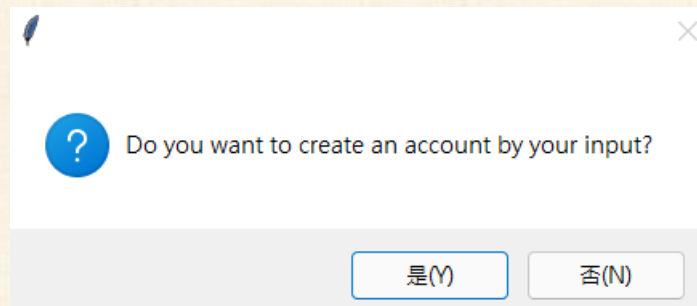
User:

Password:

Q1

提醒: debug的時候記得刪掉舊的user_info.pickle

- 下面的frame顯示User Name、Password，輸入框(Entry)，並新增Log In按鈕與Sign Up按鈕(先暫時不用設定)
- 輸入密碼時，需隱藏輸入的內容
- 設定按下Log In按鈕的功能(messagebox)
 - 帳號存在且密碼正確，顯示登入成功
 - 帳號存在但密碼錯誤，顯示密碼錯誤
 - 帳號不存在的話，按“是(Y)”可直接寫入pickle檔，如圖:



```
def login():  
    #entry.get()  
    entry_usr =  
    entry_pwd =  
  
    try:  
        try:  
            with open('user_info.pickle', 'rb') as f:  
                user_info = #讀檔  
            except EOFError:  
                user_info = #建空字典  
        except FileNotFoundError:  
            user_info = #建空字典  
  
        if ??? in ??? : #帳號存在?  
            if ??? == ???:  
                tk.messagebox.  
            else:  
                tk.messagebox.  
        else:  
            sign_up = tk.messagebox.  
            if sign_up:  
                with open('user_info.pickle', 'wb') as f:  
                    user_info = {??? : ???}  
                #
```

Attribute Error

- 如果執行時entry變數出現Exception in Tkinter callback ,

```
AttributeError: 'NoneType' object has no attribute 'get'
```

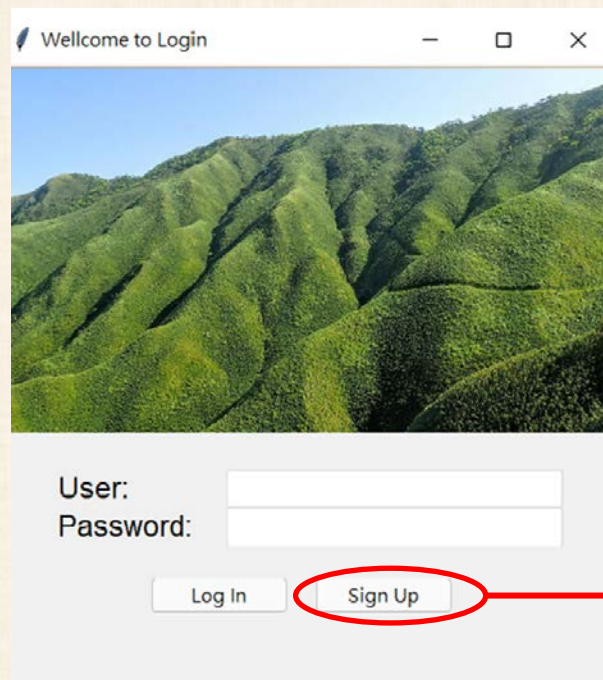
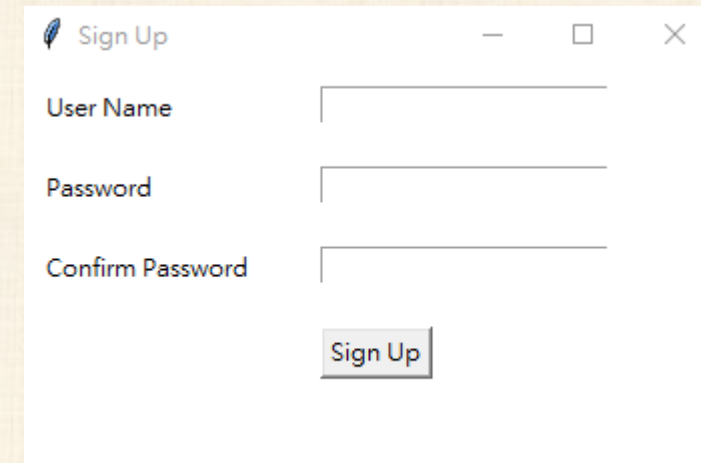
- 把你的entry和定位的pack/grid/place分成兩行寫

Python GUI Tkinter (7)

- 彈出式視窗(toplevel)
- Tk是主視窗，關閉則整個程式結束
- Toplevel是子視窗，關閉後主視窗還會存在
 - e.g. `window2 = tk.Toplevel(window)`
window2會彈出在window上 且 不需要`.mainloop()`就會顯示
 - `window2.destroy()` 自動關閉彈出式視窗

Q2

- 開始設定Q1創建的Sign Up按鈕，按下後會彈出註冊的視窗(彈出視窗)

- 設定彈出視窗的title、視窗大小(、顏色等)

Q2

- 按下彈出視窗的sign up按鈕後，先判斷
 - 若已經存在pickle檔，且裡面有內容則讀檔
 - 若已經存在pickle檔，且裡面空白則建空字典
 - 若不存在pickle檔則建空字典
- 之後判斷 (記得都要加上messagebox)
 - 帳號是否已經被註冊，若已被註冊則提示已有相同帳號存在
 - 密碼和確認密碼是否相同，若不同則提示兩者不同
 - 若都沒問題則將註冊的帳號密碼寫入pickle檔，銷毀註冊視窗，並提示註冊成功

