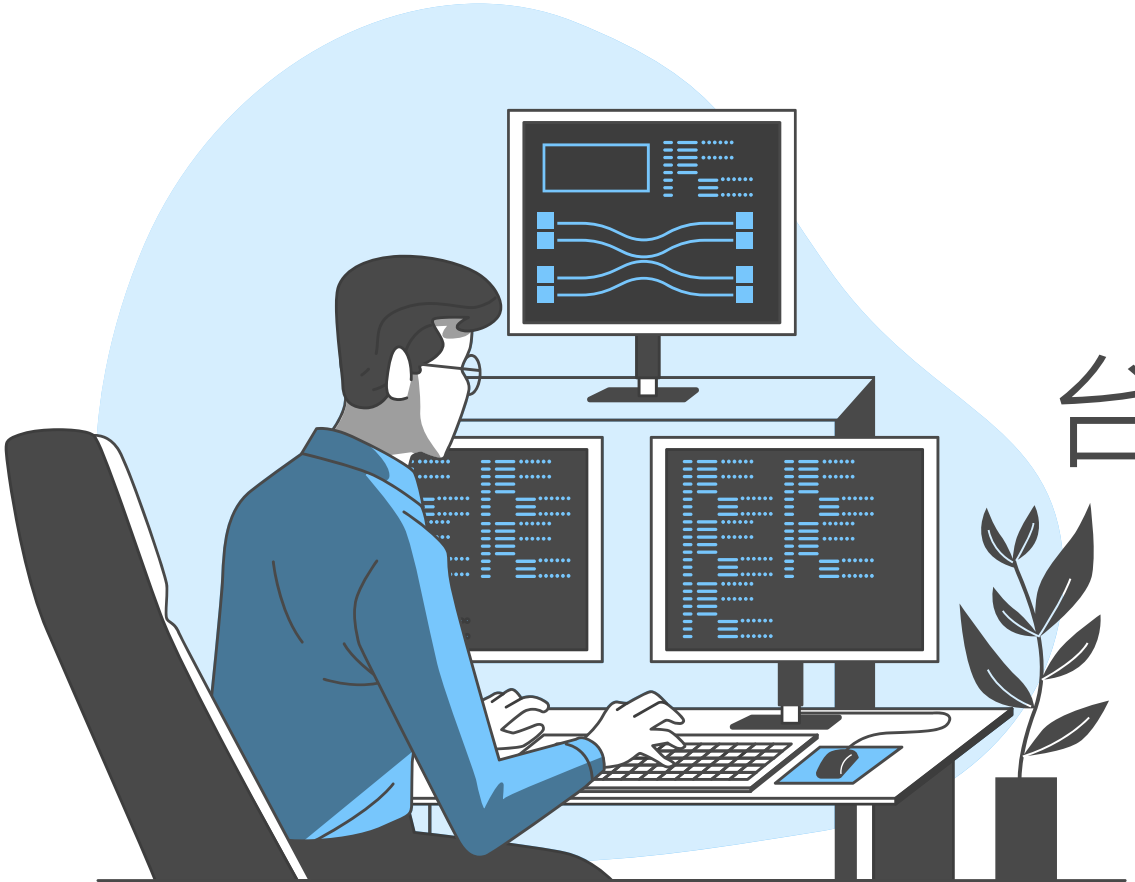
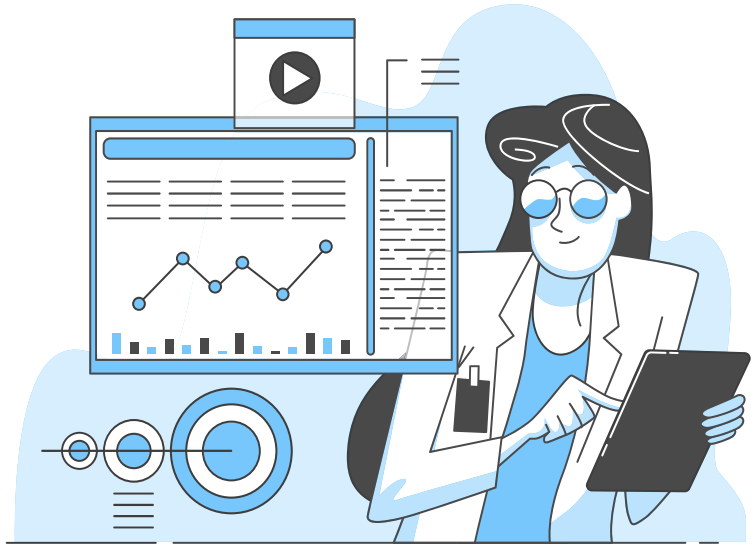


Covid-19
台灣疫情地圖

組員：林君襄 洪語涵
陳思雅 林采葳

目錄



01

選題動機

動機

啟發

隨著疫情逐漸攀升，確診數來到破萬的數字，以往整理成文字、表格的方法較不易觀看及比較。

思考

是否能夠利用課堂上所學，將資料進行視覺化，用圖表或地圖的方式方便大家觀看。

呈現

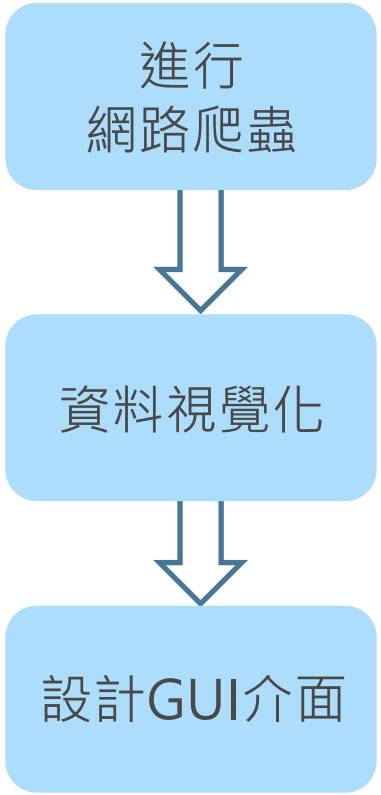
利用API的key及爬蟲抓取所需資料，再以tkinter設計GUI介面，呈現一個能夠標示最近半年，全台或是各縣市的確診分布地圖介面。

02

研究方法

1. 實驗步驟
2. 程式解說
3. 展示影片

實驗步驟



實驗步驟

進行網路爬蟲的網頁：[HTTPS://COVID-19.NCHC.ORG.TW/INDEX.PHP](https://covid-19.nchc.org.tw/index.php)

程式解說

匯入所需套件

```
from tkinter import *///匯入Tkinter所有函數及屬性
import pandas as pd
import requests
import re
from matplotlib.backends.backend_tkagg import FigureCanvasTkAgg///預設tkagg///畫布及渲染器
import matplotlib.pyplot as plt
import matplotlib.ticker as ticker
import numpy as np
///以上為匯入所需套件
```

程式解說

定義函數

```
def printSelection():///定義函數printSelection
    year = []///將year設定為空list
    value = []///將value設定為空list

    url = urllist[var.get()]///將多個網址放在一個列表頁面上顯示
    response = requests.get(url)///使用GET方式下載網頁
    m = re.search("(\[.*\])",response.text)
        ///利用search函數搜尋字符串，找到匹配字符串並傳回

    str1 = m.group(1)///存放對比到的第一筆字串
```

程式解說

提取所需資料

```
#取出圖表中數值
///讀去圖表資料後，將list分割、重組成第二個list，再取出所需資料
list_first = str1.split(",")///切割
value_connect = ":"///用以連接的符號
value_str = value_connect.join(list_first)///連接
value_list = value_str.split(":")///切割
value_len = len(value_list)///長度為value_list

for k in range(value_len):///所需資料所在list的位置
    if k % 6 == 1:
        year.append(value_list[k])
    if k % 6 == 3:
        value.append(value_list[k])

count = int(len(year)/6)
```

程式解說

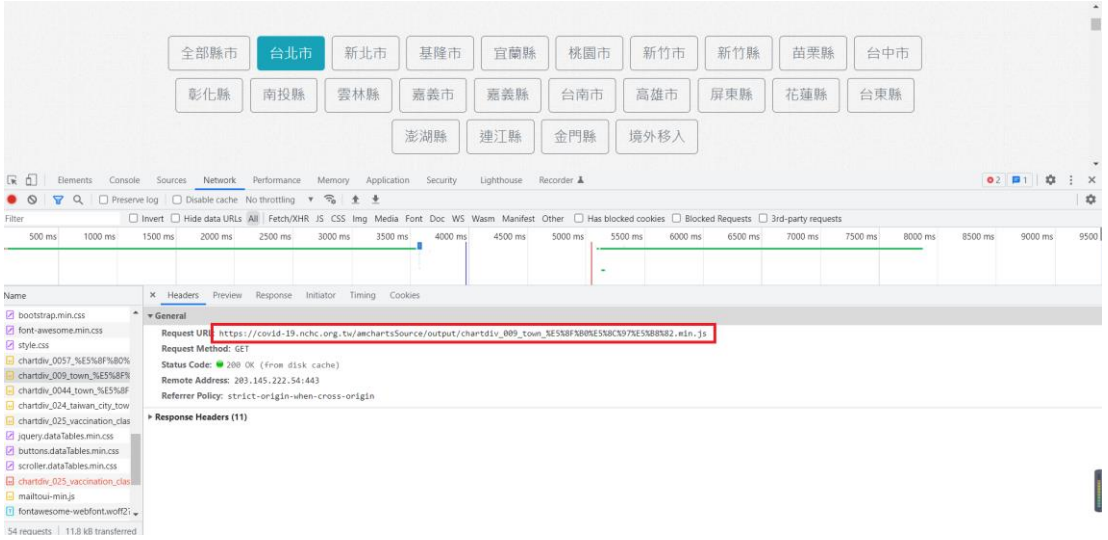
繪製圖表

```
#圖表
fig = plt.figure(figsize=(9,5),facecolor="gray")///建立畫布
cv = Canvas(win)///圖形繪製
cv.place(x=50, y=250)///圖形繪製位置
plt.subplot(111)///介面分割
plt.clf()///清除圖形
plt.title(citytitlelist[var.get()]+" Daily confirmed cases", fontproperties="SimHei", fontsize=16)
///圖表標題

plt.plot(year,value,'g')///將兩個list放於x及y軸
ax = plt.gca()///獲得坐標軸

ax.xaxis.set_major_locator(ticker.MultipleLocator(count))///設置主刻度
plt.yticks(np.linspace(0, len(value), 7),['0','5000','10000','15000','20000','25000','30000'])///設置y軸

plt.grid()///繪製網格

canvas = FigureCanvasTkAgg(fig, master=cv)///在Tkinter內嵌入matplotlib
canvas.draw()///更新繪圖
canvas.get_tk_widget().pack(side=TOP, fill=BOTH, expand=1)
                        ///放置位置 ///向x、y軸填滿 ///自動擴展
plt.ioff()///關閉互動模式
```

程式解說

取得網址

```
#取得網址
///建立資料讀取URL
url_head = "https://covid-19.nchc.org.tw/amchartsSource/output/chartdiv_009_town_"
url_tail = ".min.js"
url_taipei = url_head + "台北市" + url_tail
url_newtaipei = url_head + "新北市" + url_tail
url_keelung = url_head + "基隆市" + url_tail
url_yilan = url_head + "宜蘭縣" + url_tail
url_taoyuan = url_head + "桃園市" + url_tail
url_hsinchucity= url_head + "新竹市" + url_tail
url_hsinchucounty = url_head + "新竹縣" + url_tail
url_miaoli = url_head + "苗栗縣" + url_tail
url_taichung = url_head + "台中市" + url_tail
url_changhua = url_head + "彰化縣" + url_tail
url_nantou = url_head + "南投縣" + url_tail
url_yunlin = url_head + "雲林縣" + url_tail
url_chiayicity = url_head + "嘉義市" + url_tail
url_chiayicounty = url_head + "嘉義縣" + url_tail
url_tainan = url_head + "台南市" + url_tail
url_kaohsiung = url_head + "高雄市" + url_tail
url_pingtung = url_head + "屏東縣" + url_tail
url_hualien = url_head + "花蓮縣" + url_tail
url_tiatung = url_head + "台東縣" + url_tail
url_penghu = url_head + "澎湖縣" + url_tail
url_lianjiang = url_head + "連江縣" + url_tail
url_kinmen = url_head + "金門縣" + url_tail
url_imported = url_head + "境外移入" + url_tail
```



程式解說

建立視窗

```
#建立視窗
win=Tk()///建立視窗
win.config(bg="lightskyblue")///背景顏色
win.geometry("1000x800")///視窗大小
win.title("期末報告")///視窗標題
win.update()///更新

label1 = Label(win, text="各城市Covid-19即時資訊" , pady=3 ,fg="sandybrown"
               ,bg="forestgreen", font=("標楷體",25))///標題(各城市Covid-19即時資訊)
label1.place(x=300, y=10)///標題位置

var = IntVar()///顯示城市
var.set(0)
```

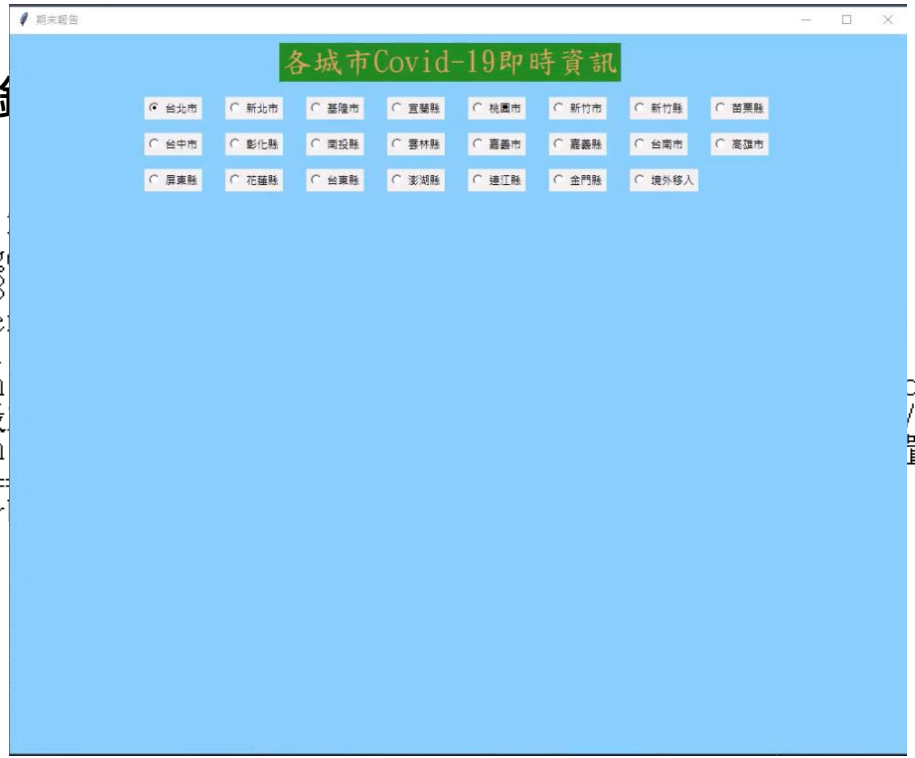
程式解說

城市串列

```
///標題的縣市
citytitlelist = {0:"Taipei", 1:"Newtaipei", 2:"Keelung", 3:"Yilan", 4:"Taoyuan", 5:"Hsinchu City",
           6:"Hsinchu County", 7:"Miaoli", 8:"Taichung", 9:"Changhua", 10:"Nantou", 11:"Yunlin",
           12:"Chiayi City", 13:"Chiayi County", 14:"Tainan", 15:"Kaohsiung", 16:"Pingtung", 17:"Hualien",
           18:"Tiatung", 19:"Penghu", 20:"Lianjiang", 21:"Kinmen", 22:"Imported"}

///城市串列
citylist = {0:"台北市", 1:"新北市", 2:"基隆市", 3:"宜蘭縣", 4:"桃園市", 5:"新竹市",
              6:"新竹縣", 7:"苗栗縣", 8:"台中市", 9:"彰化縣", 10:"南投縣", 11:"雲林縣",
              12:"嘉義市", 13:"嘉義縣", 14:"台南市", 15:"高雄市", 16:"屏東縣", 17:"花蓮縣",
              18:"台東縣", 19:"澎湖縣", 20:"連江縣", 21:"金門縣", 22:"境外移入"}

///城市串列
urllist = {0:url_taipei, 1:url_newtaipei, 2:url_keelung, 3:url_yilan,
          4:url_taoyuan, 5:url_hsinchucity, 6:url_hsinchucounty, 7:url_miaoli,
          8:url_taichung, 9:url_changhua, 10:url_nantou, 11:url_yunlin,
          12:url_chiayicity, 13:url_chiayicounty, 14:url_tainan, 15:url_kaohsiung,
          16:url_pingtung, 17:url_hualien, 18:url_tiatung, 19:url_penghu,
          20:url_lianjiang, 21:url_kinmen, 22:url_imported}
```

程式解說

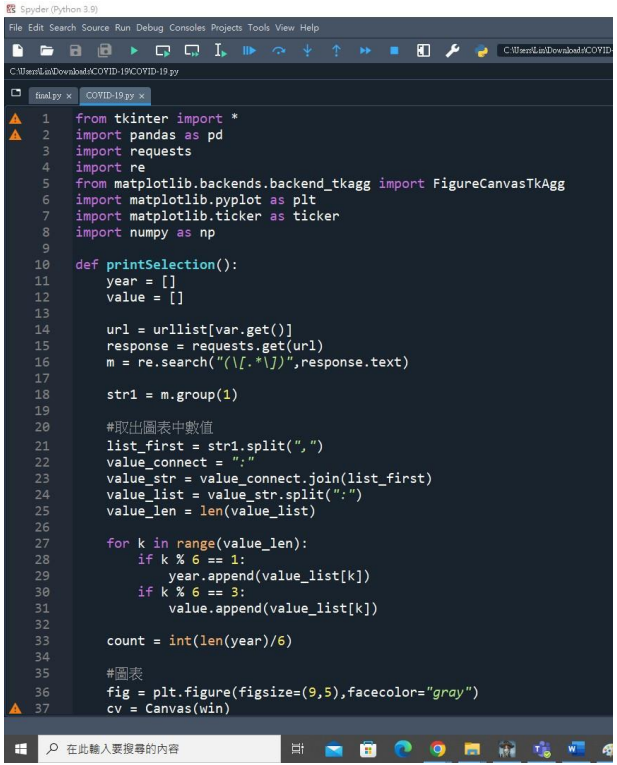
設定按鈕



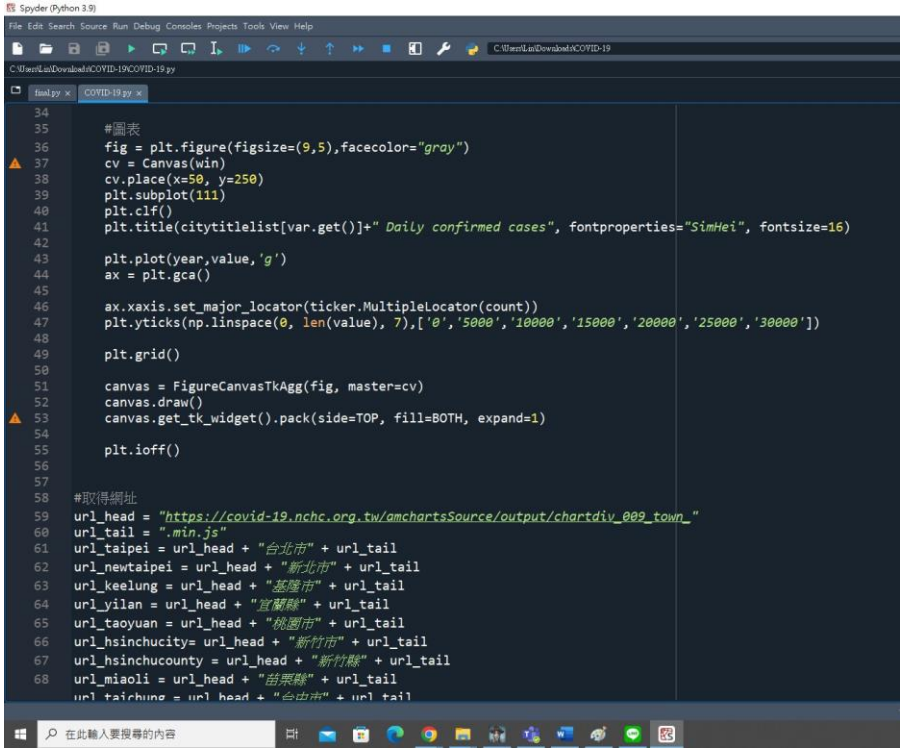

```
for i in range(0,
    for j in rang
        n = i * 8
        if(n < le
            cityl
            rbtem
            ///設
            rbtem
            if(n=
                r
```

```
ommand=printSelection)
//呼叫指令def
置
```

所有程式碼

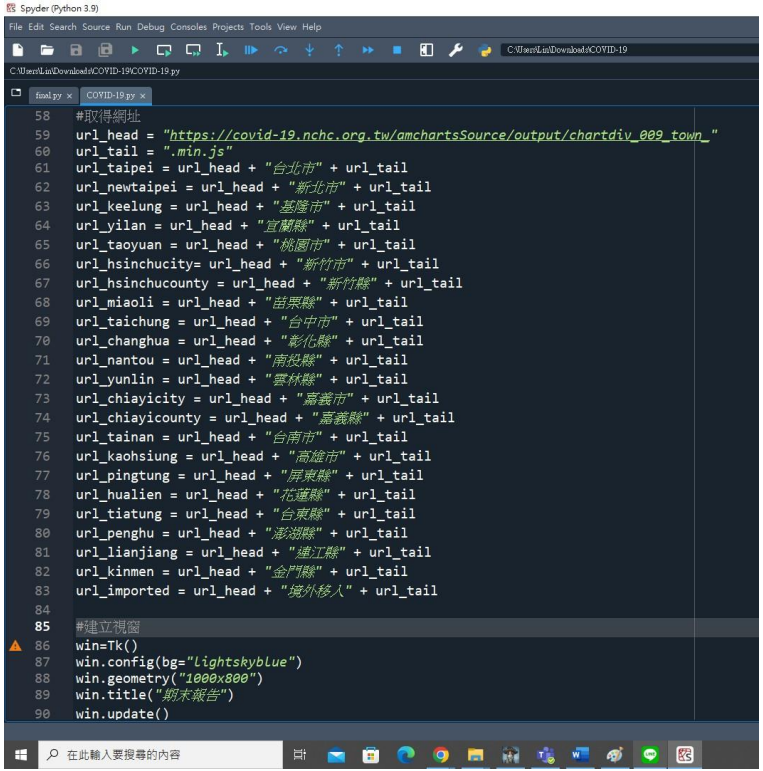


```
from tkinter import *
import pandas as pd
import requests
import re
from matplotlib.backends.backend_tkagg import FigureCanvasTkAgg
import matplotlib.pyplot as plt
import matplotlib.ticker as ticker
import numpy as np

def printSelection():
    year = []
    value = []

    url = urllist[var.get()]
    response = requests.get(url)
    m = re.search("(\[.*\])",response.text)

    str1 = m.group(1)

    #取出圖表中數值
    list_first = str1.split(",")
    value_connect = ":"
    value_str = value_connect.join(list_first)
    value_list = value_str.split(":")
    value_len = len(value_list)

    for k in range(value_len):
        if k % 6 == 1:
            year.append(value_list[k])
        if k % 6 == 3:
            value.append(value_list[k])

    count = int(len(year)/6)

    #圖表
    fig = plt.figure(figsize=(9,5),facecolor="gray")
    cv = Canvas(win)
```



```
    #圖表
    fig = plt.figure(figsize=(9,5),facecolor="gray")
    cv = Canvas(win)
    cv.place(x=50, y=250)
    plt.subplot(111)
    plt.clf()
    plt.title(citytitlelist[var.get()]+" Daily confirmed cases", fontproperties="SimHei", fontsize=16)

    plt.plot(year,value,'g')
    ax = plt.gca()

    ax.xaxis.set_major_locator(ticker.MultipleLocator(count))
    plt.yticks(np.linspace(0, len(value), 7),['0','5000','10000','15000','20000','25000','30000'])

    plt.grid()

    canvas = FigureCanvasTkAgg(fig, master=cv)
    canvas.draw()
    canvas.get_tk_widget().pack(side=TOP, fill=BOTH, expand=1)

    plt.ioff()


#取得網址
url_head = "https://covid-19.nchc.org.tw/amchartsSource/output/chartdiv_009_town_"
url_tail = ".min.js"
url_taipei = url_head + "台北市" + url_tail
url_newtaipei = url_head + "新北市" + url_tail
url_keelung = url_head + "基隆市" + url_tail
url_yilan = url_head + "宜蘭縣" + url_tail
url_taoyuan = url_head + "桃園市" + url_tail
url_hsinchucity= url_head + "新竹市" + url_tail
url_hsinchucounty = url_head + "新竹縣" + url_tail
url_miaoli = url_head + "苗栗縣" + url_tail
```

所有程式碼


Spyder (Python 3.9)
File Edit Search Source Run Debug Consoles Projects Tools View Help
final.py
COVID-19.py
#取得網址
url_head = "https://covid-19.nchc.org.tw/amchartsSource/output/chartdiv_009_town_"
url_tail = ".min.js"
url_taipei = url_head + "台北市" + url_tail
url_newtaipei = url_head + "新北市" + url_tail
url_keelung = url_head + "基隆市" + url_tail
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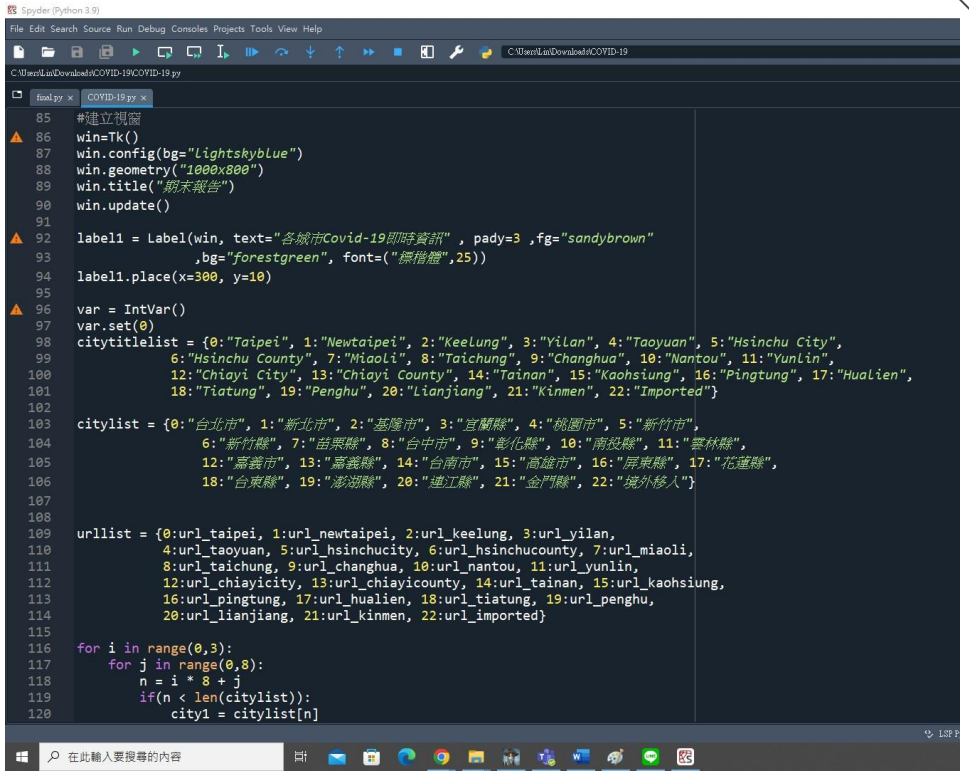
url_nantou = url_head + "南投縣" + url_tail
url_yunlin = url_head + "雲林縣" + url_tail
url_chiayicity = url_head + "嘉義市" + url_tail
url_chiayicounty = url_head + "嘉義縣" + url_tail
url_tainan = url_head + "台南市" + url_tail
url_kaohsiung = url_head + "高雄市" + url_tail
url_pingtung = url_head + "屏東縣" + url_tail
url_hualien = url_head + "花蓮縣" + url_tail
url_tiatung = url_head + "台東縣" + url_tail
url_penghu = url_head + "澎湖縣" + url_tail
url_lianjiang = url_head + "連江縣" + url_tail
url_kinmen = url_head + "金門縣" + url_tail
url_imported = url_head + "境外移入" + url_tail
#建立視窗
win=Tk()
win.config(bg="Lightskyblue")
win.geometry("1000x800")
win.title("期末報告")
win.update()
在此輸入要搜尋的內容


Spyder (Python 3.9)
File Edit Search Source Run Debug Consoles Projects Tools View Help
final.py
COVID-19.py
#建立視窗
win=Tk()
win.config(bg="Lightskyblue")
win.geometry("1000x800")
win.title("期末報告")
win.update()
label1 = Label(win, text="各城市Covid-19即時資訊" , pady=3 ,fg="sandybrown"
,bg="forestgreen", font=("標楷體",25))
label1.place(x=300, y=10)
var = IntVar()
var.set(0)
citytitlelist = {0:"Taipei", 1:"Newtaipei", 2:"Keelung", 3:"Yilan", 4:"Taoyuan", 5:"Hsinchu City",
6:"Hsinchu County", 7:"Miaoli", 8:"Taichung", 9:"Changhua", 10:"Nantou", 11:"Yunlin",
12:"Chiayi City", 13:"Chiayi County", 14:"Tainan", 15:"Kaohsiung", 16:"Pingtung", 17:"Hualien",
18:"Tiatung", 19:"Penghu", 20:"Lianjiang", 21:"Kinmen", 22:"Imported"}
citylist = {0:"台北市", 1:"新北市", 2:"基隆市", 3:"宜蘭縣", 4:"桃園市", 5:"新竹市",
6:"新竹縣", 7:"苗栗縣", 8:"台中市", 9:"彰化縣", 10:"南投縣", 11:"雲林縣",
12:"嘉義市", 13:"嘉義縣", 14:"台南市", 15:"高雄市", 16:"屏東縣", 17:"花蓮縣",
18:"台東縣", 19:"澎湖縣", 20:"連江縣", 21:"金門縣", 22:"境外移入"}
urllist = {0:url_taipei, 1:url_newtaipei, 2:url_keelung, 3:url_yilan,
4:url_taoyuan, 5:url_hsinchucity, 6:url_hsinchucounty, 7:url_miaoli,
8:url_taichung, 9:url_changhua, 10:url_nantou, 11:url_yunlin,
12:url_chiayicity, 13:url_chiayicounty, 14:url_tainan, 15:url_kaohsiung,
16:url_pingtung, 17:url_hualien, 18:url_tiatung, 19:url_penghu,
20:url_lianjiang, 21:url_kinmen, 22:url_imported}
for i in range(0,3):
for j in range(0,8):
n = i * 8 + j
if(n < len(citylist)):
city1 = citylist[n]
在此輸入要搜尋的內容

所有程式碼

```
label1 = Label(win, text="各城市Covid-19即時資訊" , pady=3 ,fg="sandybrown"
               ,bg="forestgreen", font=("標楷體",25))
label1.place(x=300, y=10)

var = IntVar()
var.set(0)
citytitlelist = {0:"Taipei", 1:"Newtaipei", 2:"Keelung", 3:"Yilan", 4:"Taoyuan", 5:"Hsinchu City",
            6:"Hsinchu County", 7:"Miaoli", 8:"Taichung", 9:"Changhua", 10:"Nantou", 11:"Yunlin",
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            18:"Tiatung", 19:"Penghu", 20:"Lianjiang", 21:"Kinmen", 22:"Imported"}

citylist = {0:"台北市", 1:"新北市", 2:"基隆市", 3:"宜蘭縣", 4:"桃園市", 5:"新竹市",
              6:"新竹縣", 7:"苗栗縣", 8:"台中市", 9:"彰化縣", 10:"南投縣", 11:"雲林縣",
              12:"嘉義市", 13:"嘉義縣", 14:"台南市", 15:"高雄市", 16:"屏東縣", 17:"花蓮縣",
              18:"台東縣", 19:"澎湖縣", 20:"連江縣", 21:"金門縣", 22:"境外移入"}


urllist = {0:url_taipei, 1:url_newtaipei, 2:url_keelung, 3:url_yilan,
          4:url_taoyuan, 5:url_hsinchucity, 6:url_hsinchucounty, 7:url_miaoli,
          8:url_taichung, 9:url_changhua, 10:url_nantou, 11:url_yunlin,
          12:url_chiayicity, 13:url_chiayicounty, 14:url_tainan, 15:url_kaohsiung,
          16:url_pingtung, 17:url_hualien, 18:url_tiatung, 19:url_penghu,
          20:url_lianjiang, 21:url_kinmen, 22:url_imported}

for i in range(0,3):
    for j in range(0,8):
        n = i * 8 + j
        if(n < len(citylist)):
            city1 = citylist[n]
            rbtem = Radiobutton(win, text=city1, variable=var, value=n, command=printSelection)
            rbtem.place(x = j * 90 + 150 ,y = i * 40 + 70)
            if(n==0):
                rbtem.select()

win.mainloop()
```
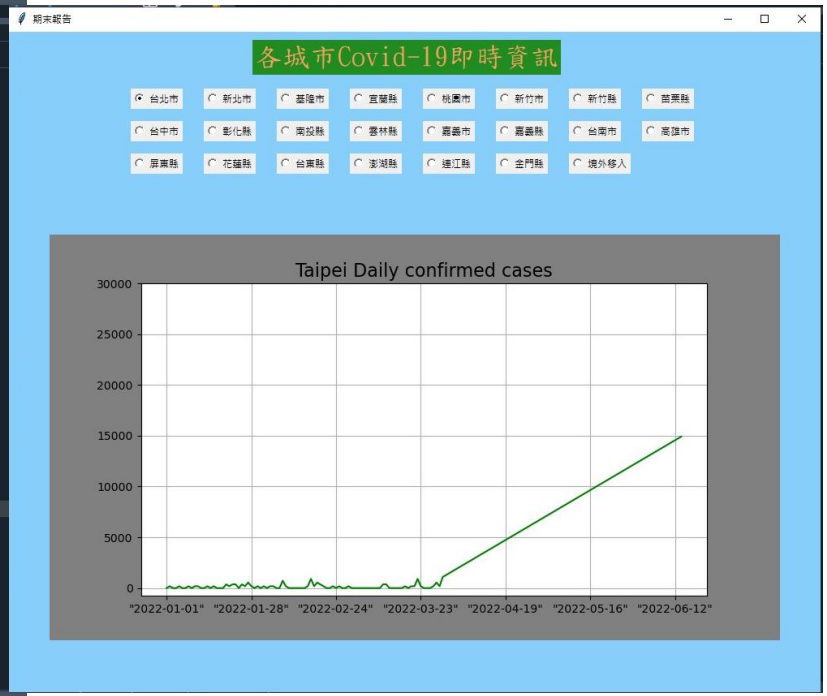



展示影片

Spyder (Python 3.9)

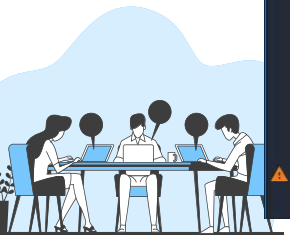
File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Lin\Downloads\COVID-19

C:\Users\Lin\Downloads\COVID-19\COVID-19.py

final.py × COVID-19.py ×

```python
from tkinter import *
import pandas as pd
import requests
import re
from matplotlib.backends.backend_tkagg import FigureCanvasTkAgg
import matplotlib.pyplot as plt
import matplotlib.ticker as ticker
import numpy as np

def printSelection():
    year = []
    value = []

    url = urllist[var.get()]
    response = requests.get(url)
    m = re.search("(\[.*\])",response.text)

    str1 = m.group(1)

    #取出圖表中數值
    list_first = str1.split(",")
    value_connect = ":"
    value_str = value_connect.join(list_first)
    value_list = value_str.split(":")
    value_len = len(value_list)

    for k in range(value_len):
        if k % 6 == 1:
            year.append(value_list[k])
        if k % 6 == 3:
            value.append(value_list[k])

    count = int(len(year)/6)

    #圖表
    fig = plt.figure(figsize=(9,5),facecolor="gray")
    cv = Canvas(win)
    cv.place(x=50, y=250)
    plt.subplot(111)
```



03

問題討論

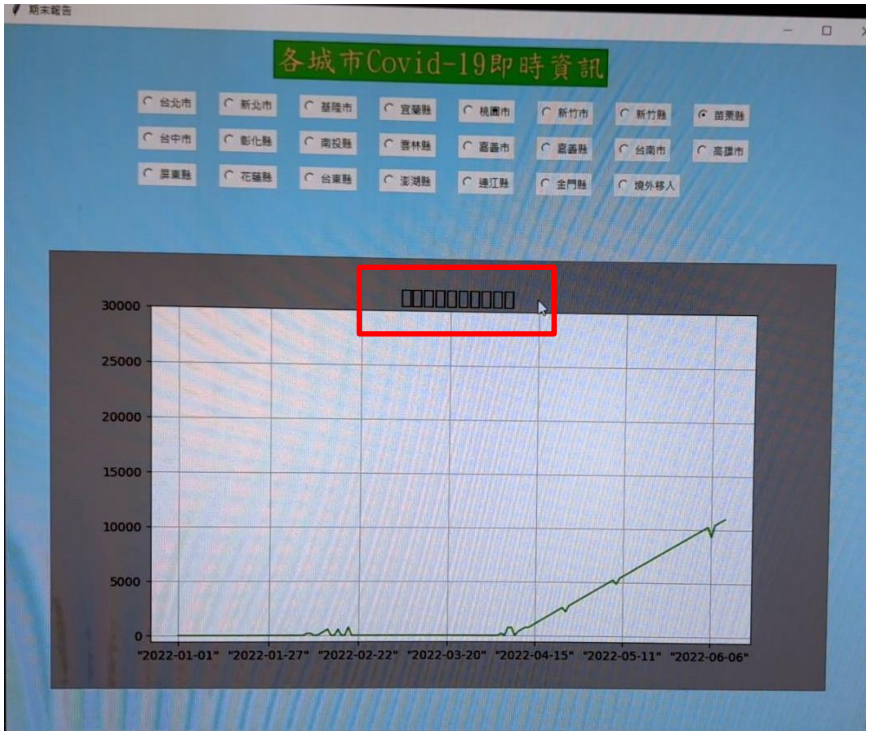
1. 遇到的問題
2. 修改
3. 實際應用

遇到的問題

1. 標題無法正常顯示中文

原程式

```
#圖表
fig = plt.figure(figsize=(9,5),facecolor="gray")
cv = Canvas(win)
cv.place(x=50, y=250)
plt.subplot(111)
plt.clf()
plt.title(citylist[var.get()]+"每日新增確診數", fontproperties="SimHei", fontsize=16)
plt.plot(year,value,'g')
ax = plt.gca()
```



2. 無法結合地圖功能

修改

問題 1 解決方法：將標題改成英文

更正此行

```
#圖表
fig = plt.figure(figsize=(9,5),facecolor="gray")///建立畫布
cv = Canvas(win)///圖形繪製
cv.place(x=50, y=250)///圖形繪製位置
plt.subplot(111)///介面分割
plt.clf()///清除圖形
plt.title(citytitlelist[var.get()]+" Daily confirmed cases", fontproperties="SimHei", fontsize=16)
///圖表標題
```

新增此行

```
///標題的縣市
citytitlelist = {0:"Taipei", 1:"Newtaipei", 2:"Keelung", 3:"Yilan", 4:"Taoyuan", 5:"Hsinchu City",
            6:"Hsinchu County", 7:"Miaoli", 8:"Taichung", 9:"Changhua", 10:"Nantou", 11:"Yunlin",
            12:"Chiayi City", 13:"Chiayi County", 14:"Tainan", 15:"Kaohsiung", 16:"Pingtung", 17:"Hualien",
            18:"Tiatung", 19:"Penghu", 20:"Lianjiang", 21:"Kinmen", 22:"Imported"}
```

問題 2 解決方法：將地圖更改為以圖表呈現

實際應用

1. 疫情分布地圖
2. 熱門觀光區人流（預測）圖
3. 車流狀況（預測）圖

謝謝大家