

# Colab操作說明

教學科技中心

# GOOGLE COLAB 操作說明

- **Google Colab**

- 由google所提供的免費雲端開發環境
- Colaboratory, or "Colab" for short, allows you to write and execute Python in your browser, with
  - **Zero configuration required** ( 幾乎不需要進行任何的事前環境設置 )
  - **Free access to GPUs** ( 免費的GPU運算資源，更強大的平行處理能力 )
  - **Easy sharing** ( 可輕鬆地分享或協同合作開發專案 )

# GOOGLE COLAB 操作說明

- **Google Colab**

- google 搜尋 google colab，第一個超連結應該就是我們要的答案了
- 或者是使用 <https://colab.research.google.com/> 進行連結



點擊超連結後，就能看到colab的主畫面了

The screenshot shows the Google Colaboratory (Colab) interface. At the top, there's a navigation bar with the Colab logo, the text 'Welcome To Colaboratory', and a menu with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. On the right side of the navigation bar, there are icons for 'Share', a user profile, a settings gear, and a 'Sign in' button. Below the navigation bar, there's a 'Table of contents' sidebar on the left with a search icon and a list of items: 'Getting started', 'Data science', 'Machine learning', 'More Resources', 'Machine Learning Examples', and a '+ Section' button. The main content area has a toolbar with '+ Code', '+ Text', and 'Copy to Drive' buttons. Below the toolbar, there's a header for 'What is Colaboratory?' with the Colab logo. The main text explains that Colaboratory, or 'Colab' for short, allows users to write and execute Python in their browser. It lists three key features: 'Zero configuration required', 'Free access to GPUs', and 'Easy sharing'. Below this, it says 'Whether you're a student, a data scientist or an AI researcher, Colab can make your work easier. Watch Introduction to Colab to learn more, or just get started below!'. A section titled 'Getting started' follows, explaining that the document is an interactive environment called a 'Colab notebook'. It provides an example of a code cell with a short Python script that computes the number of seconds in a day and prints the result. The code is: 

```
[ ] seconds_in_a_day = 24 * 60 * 60
seconds_in_a_day
```

 The output is 86400. It then explains how to execute the code and edit the cell. It also mentions that variables defined in one cell can be used in other cells. Another code cell is shown: 

```
[ ] seconds_in_a_week = 7 * seconds_in_a_day
seconds_in_a_week
```

 The output is 604800. Finally, it explains that Colab notebooks allow combining executable code and rich text, and that they are stored in the user's Google Drive account. It provides a link to 'create a new Colab notebook'.

Welcome To Colaboratory  
File Edit View Insert Runtime Tools Help

Table of contents  
Getting started  
Data science  
Machine learning  
More Resources  
Machine Learning Examples  
+ Section

+ Code + Text Copy to Drive

Connect Editing

## What is Colaboratory?

Colaboratory, or "Colab" for short, allows you to write and execute Python in your browser, with

- Zero configuration required
- Free access to GPUs
- Easy sharing

Whether you're a **student**, a **data scientist** or an **AI researcher**, Colab can make your work easier. Watch [Introduction to Colab](#) to learn more, or just get started below!

### Getting started

The document you are reading is not a static web page, but an interactive environment called a **Colab notebook** that lets you write and execute code.

For example, here is a **code cell** with a short Python script that computes a value, stores it in a variable, and prints the result:

```
[ ] seconds_in_a_day = 24 * 60 * 60
seconds_in_a_day
```

86400

To execute the code in the above cell, select it with a click and then either press the play button to the left of the code, or use the keyboard shortcut "Command/Ctrl+Enter". To edit the code, just click the cell and start editing.

Variables that you define in one cell can later be used in other cells:

```
[ ] seconds_in_a_week = 7 * seconds_in_a_day
seconds_in_a_week
```

604800

Colab notebooks allow you to combine **executable code** and **rich text** in a single document, along with **images**, **HTML**, **LaTeX** and more. When you create your own Colab notebooks, they are stored in your Google Drive account. You can easily share your Colab notebooks with co-workers or friends, allowing them to comment on your notebooks or even edit them. To learn more, see [Overview of Colab](#). To create a new Colab notebook you can use the File menu above, or use the following link: [create a new Colab notebook](#).

接下來要進行開新專案的時候，colab就會要求你登入google帳號，不然就不能再做任何動作...

# Google sign-in required

You must be logged in with a Google Account to continue.

OK



## Choose an account



張哲誠

Signed out



Use another account



Remove an account

畫面右上角顯示帳號資訊，即表示登入成功

Welcome To Colaboratory  
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Share Connect Editing

## What is Colaboratory?

Colaboratory, or "Colab" for short, allows you to write and execute Python in your browser, with

- Zero configuration required
- Free access to GPUs
- Easy sharing

Whether you're a **student**, a **data scientist** or an **AI researcher**, Colab can make your work easier. Watch [Introduction to Colab](#) to learn more, or just get started below!

### Getting started

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For example, here is a **code cell** with a short Python script that computes a value, stores it in a variable, and prints the result:

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seconds_in_a_day
```

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To execute the code in the above cell, select it with a click and then either press the play button to the left of the code, or use the keyboard shortcut "Command/Ctrl+Enter". To edit the code, just click the cell and start editing.

Variables that you define in one cell can later be used in other cells:

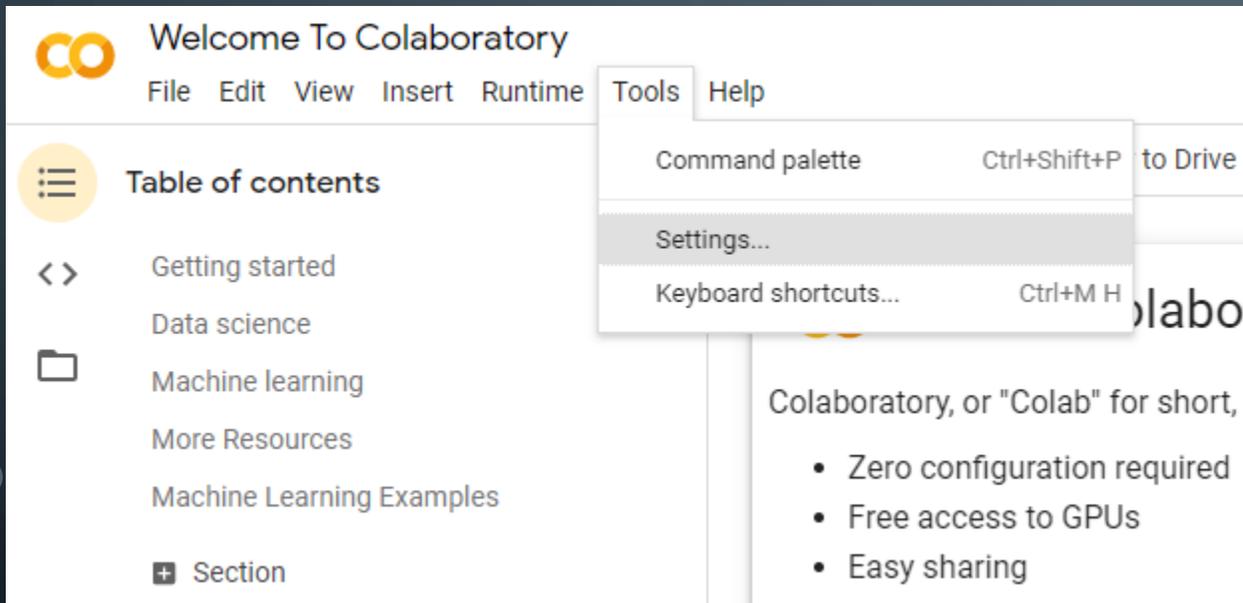
```
[ ] seconds_in_a_week = 7 * seconds_in_a_day
seconds_in_a_week
```

604800

Colab notebooks allow you to combine **executable code** and **rich text** in a single document, along with **images**, **HTML**, **LaTeX** and more. When you create your own Colab notebooks, they are stored in your Google Drive account. You can easily share your Colab notebooks with co-workers or friends, allowing them to comment on your notebooks or even edit them. To learn more, see [Overview of Colab](#). To create a new Colab notebook you can use the File menu above, or use the following link: [create a new Colab notebook](#).

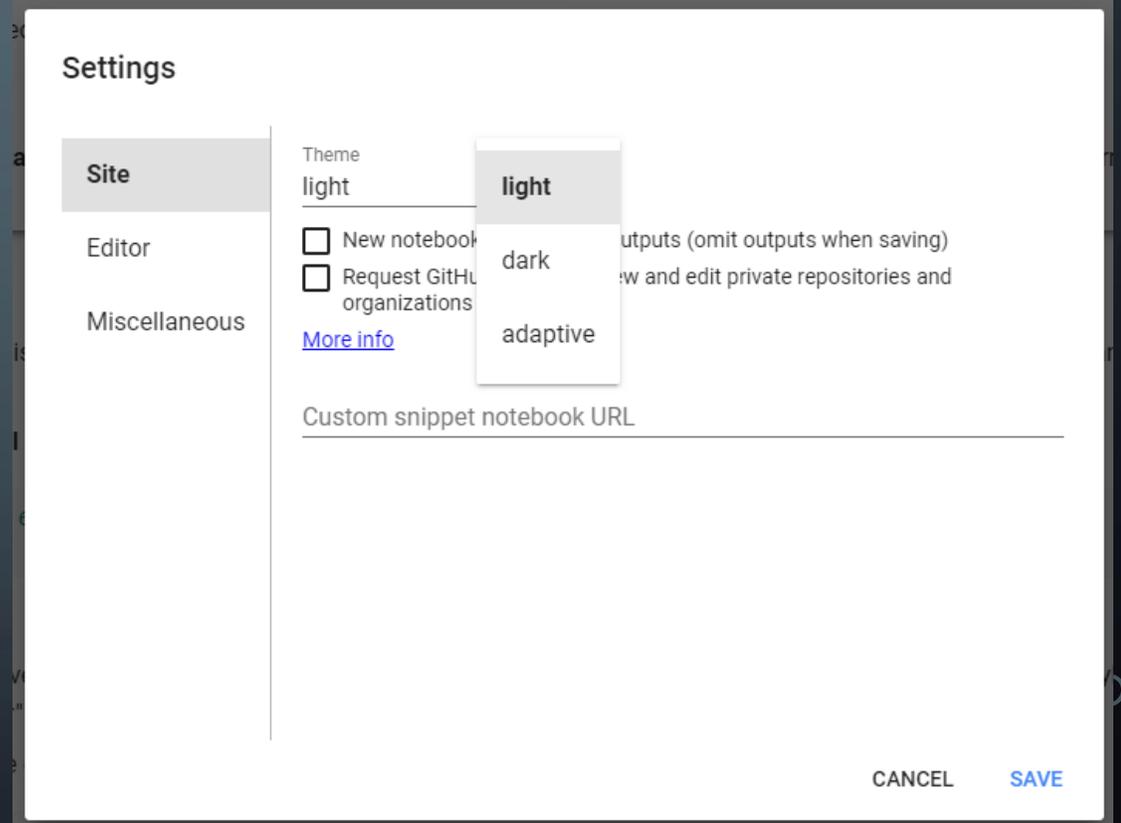
接著來進行一些簡單的設定.....  
單純只是個人習慣，不設定也能正常使用

工具列 Tools → Settings...



Site → Theme → dark

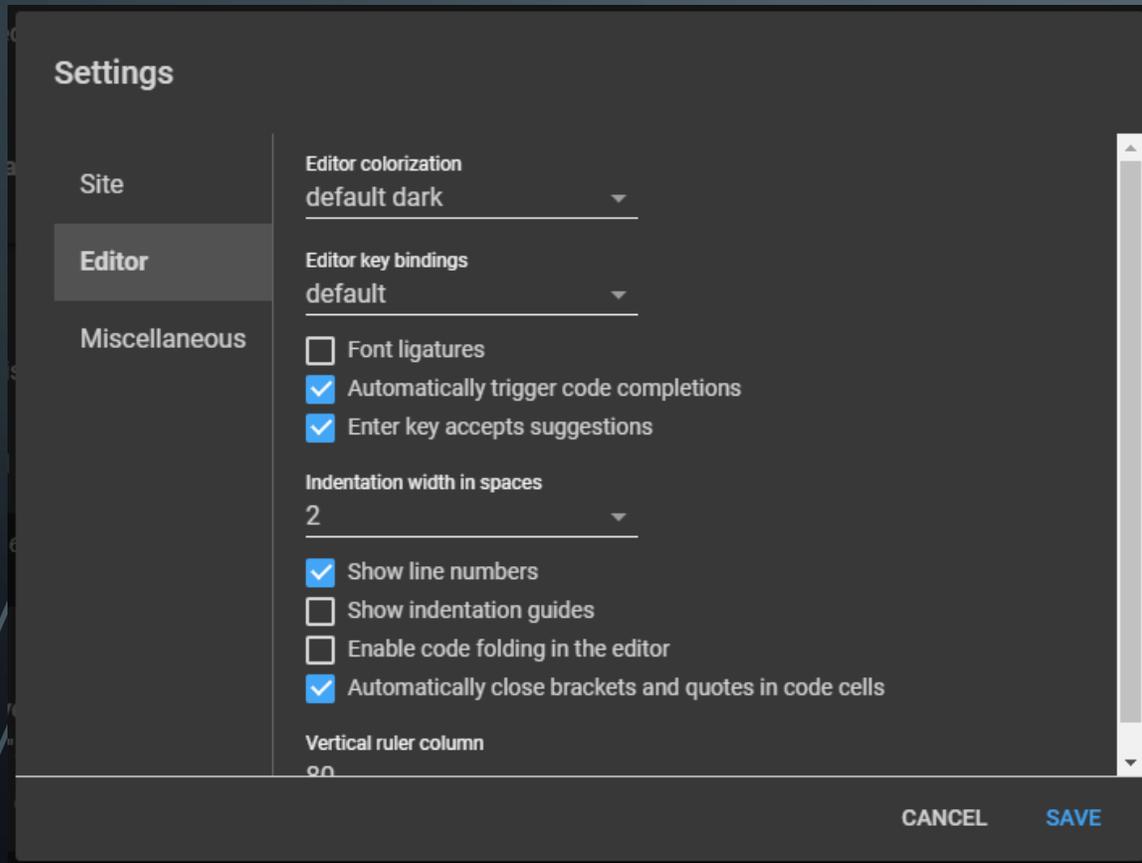
系統佈景顏色就會變成深色系，這樣子在寫程式的時候，就會感覺眼睛比較不會這麼累（？）



接著來進行一些簡單的設定.....  
單純只是個人習慣，不設定也能正常使用

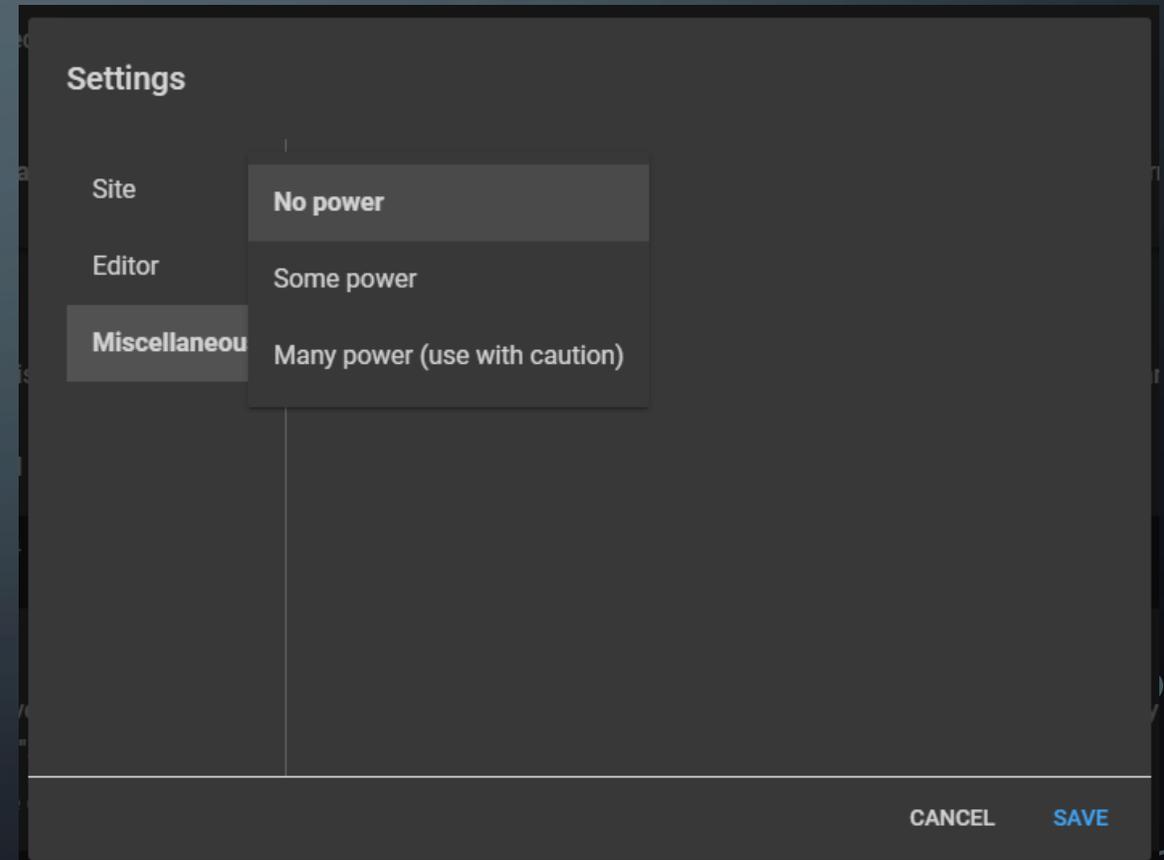
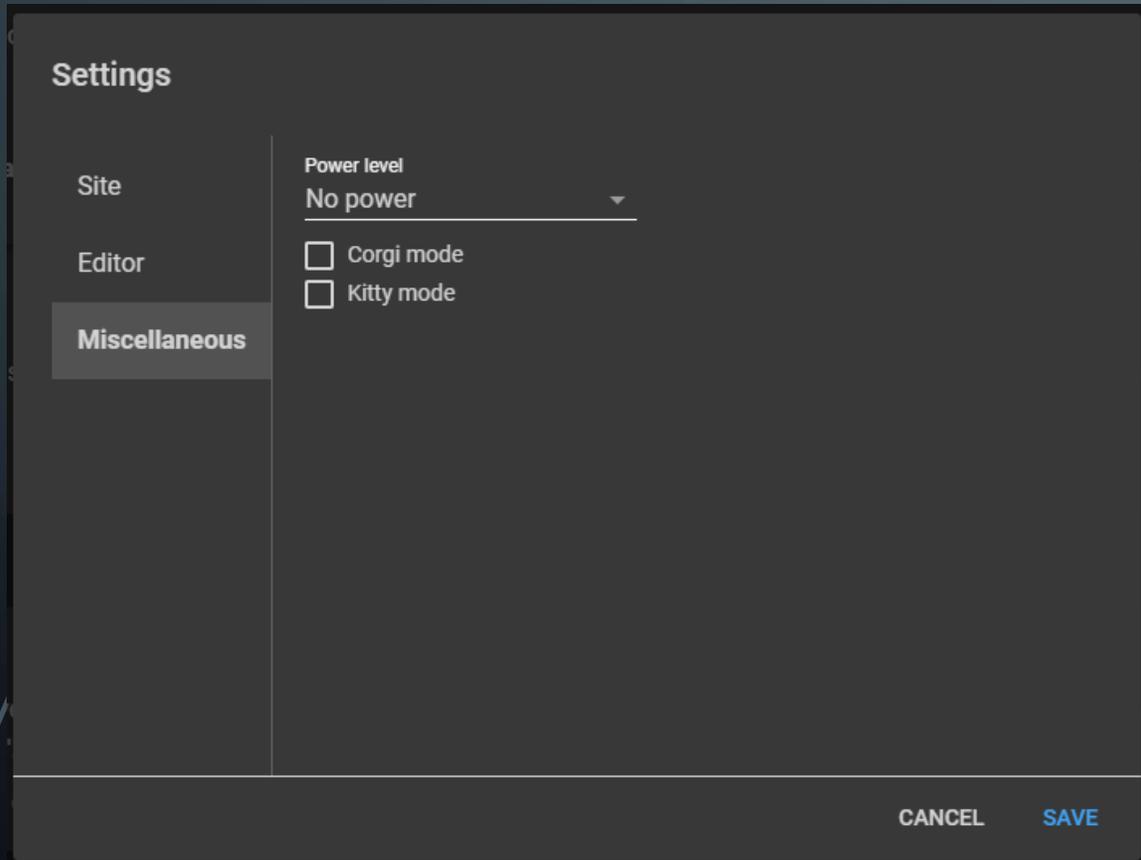
Editor → Show line numbers

編輯器畫面就會產生行號，方便閱讀及說明



接著來進行一些簡單的設定.....  
單純只是個人習慣，不設定也能正常使用

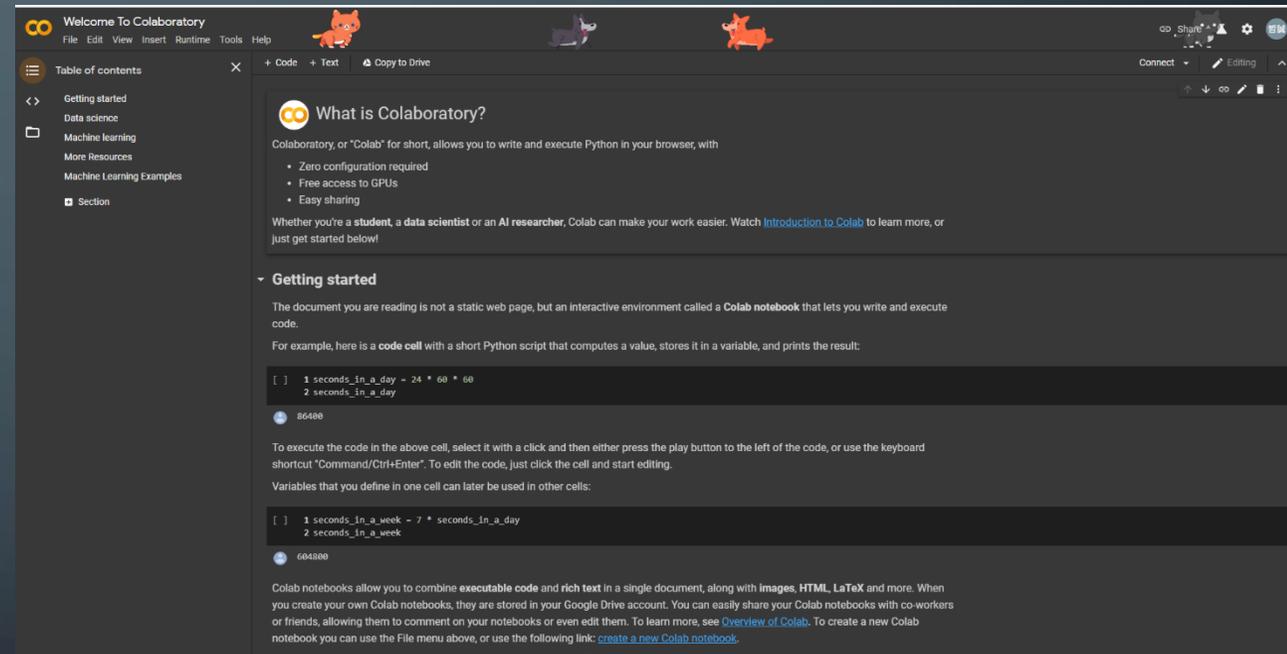
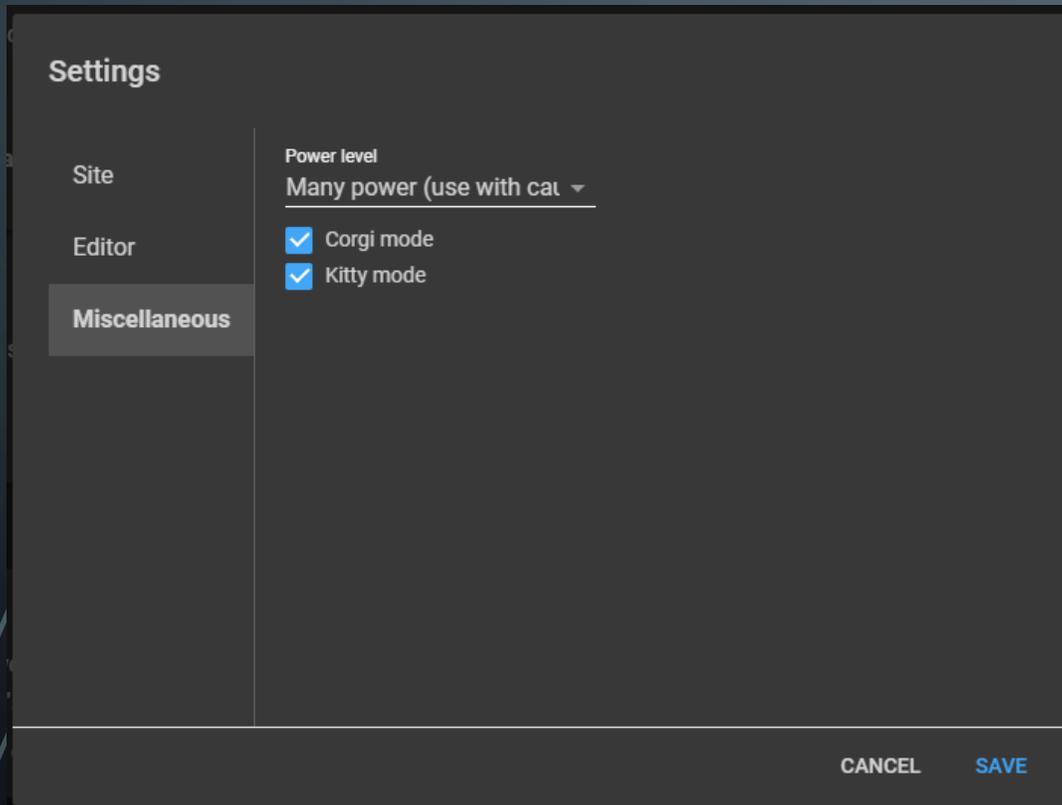
Miscellaneous → Power level → Many power  
在打字時會有一個類似電玩COMBO的特效



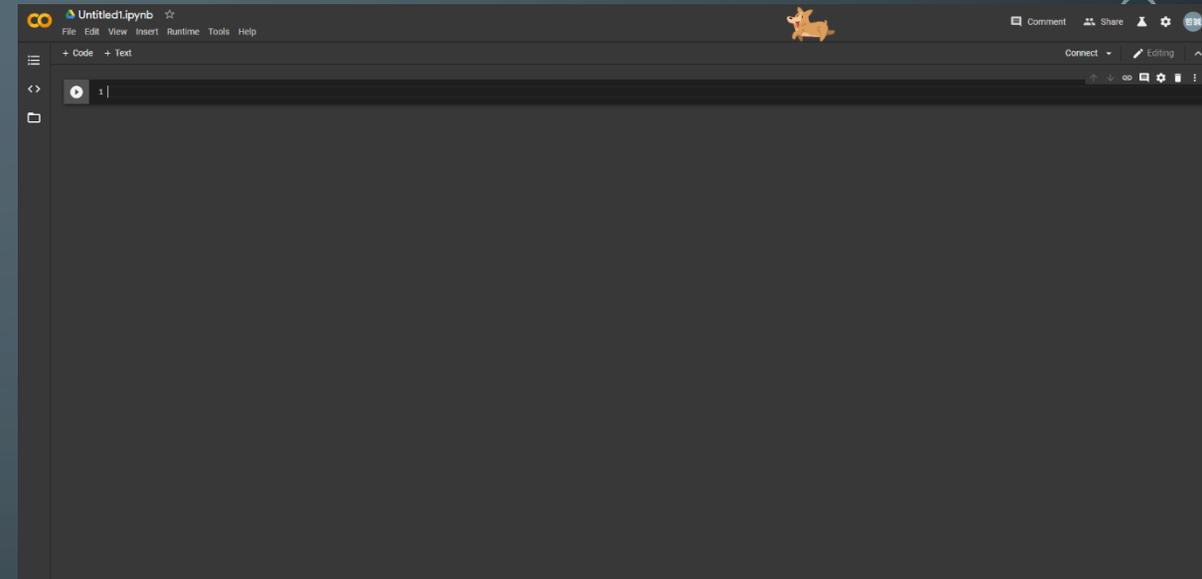
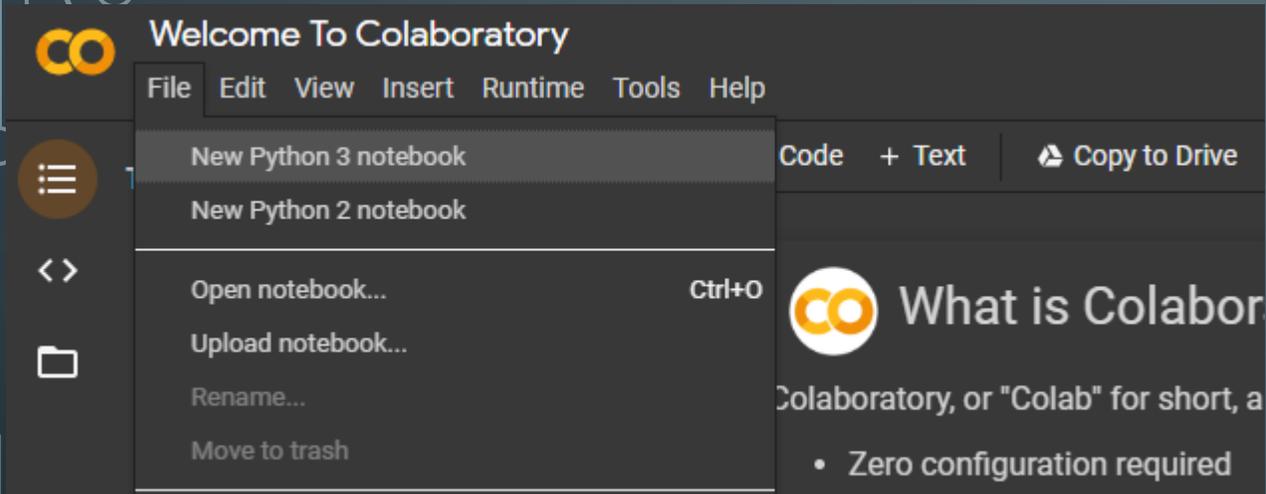
接著來進行一些簡單的設定.....  
單純只是個人習慣，不設定也能正常使用

Miscellaneous → Corgi mode & Kitty mode

會出現可愛的狗狗&貓貓在畫面上走來走去...

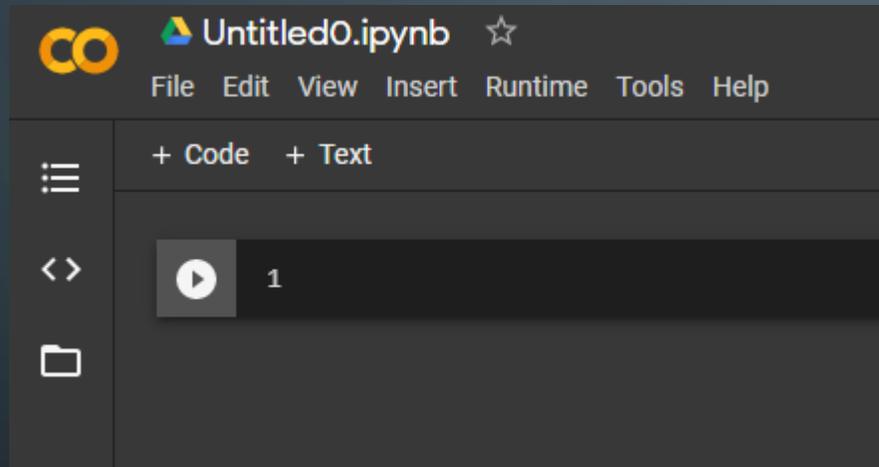


要建立一個全新的Python 3專案時，到工具列  
File → New Python 3 notebook，就可以在  
瀏覽器開一個新的分頁進行專案開發

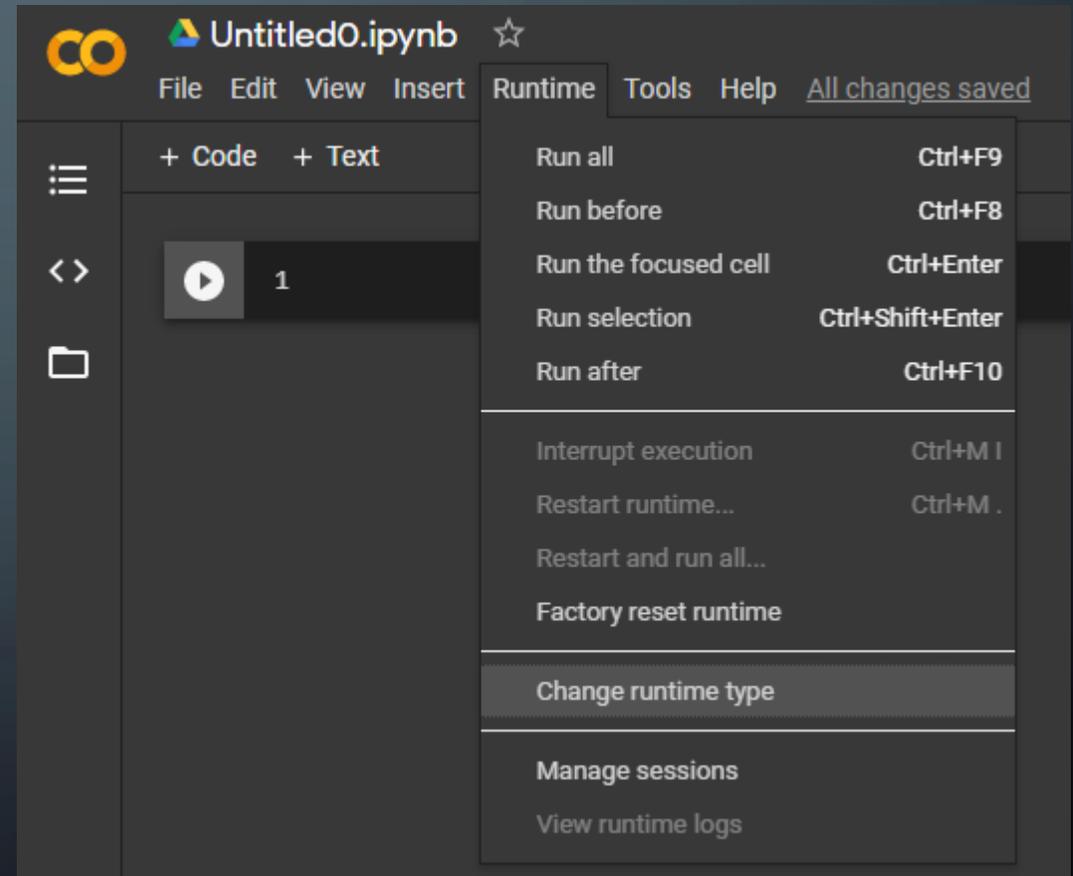


建立專案後，可以選擇本專案是否要使用硬體加速  
一般而言，如果是一些簡單的小專案，就可以跳過此步驟  
如果是需要用到平行運算來訓練模型的話，開啟此功能在  
運算效率上會相當有感

一些比較常用的工具列都會位於左上方



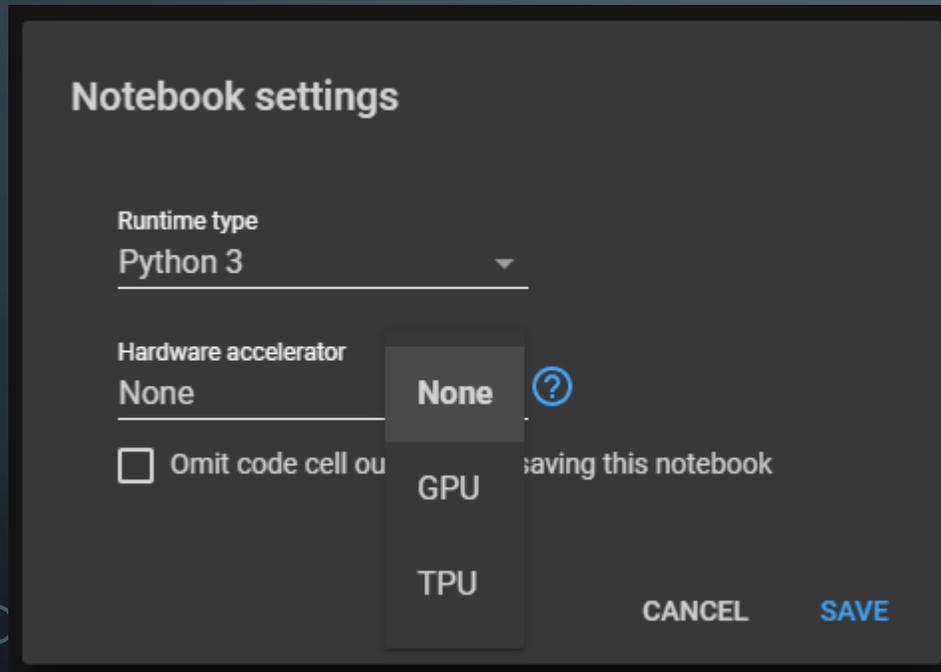
Runtime → Change runtime type



建立專案後，可以選擇本專案是否要使用硬體加速  
一般而言，如果是一些簡單的小專案，就可以跳過此步驟  
如果是需要用到平行運算來訓練模型的話，開啟此功能在  
運算效率上會相當有感

Hardware accelerator → GPU

之後按下SAVE就代表已完成修改



**Notebook settings**

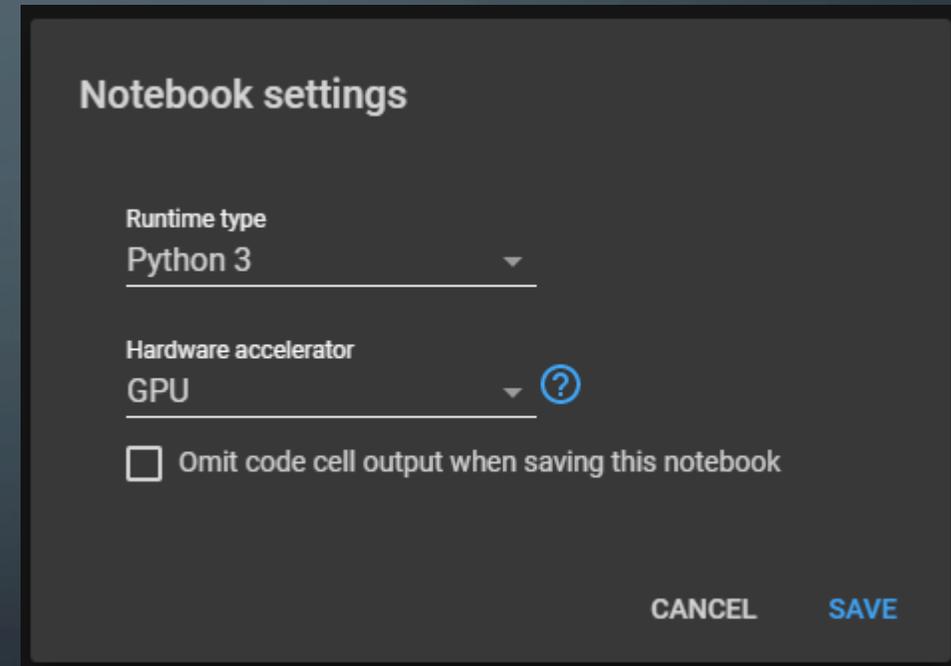
Runtime type  
Python 3

Hardware accelerator  
None

Omit code cell output when saving this notebook

None  
GPU  
TPU

CANCEL SAVE



**Notebook settings**

Runtime type  
Python 3

Hardware accelerator  
GPU

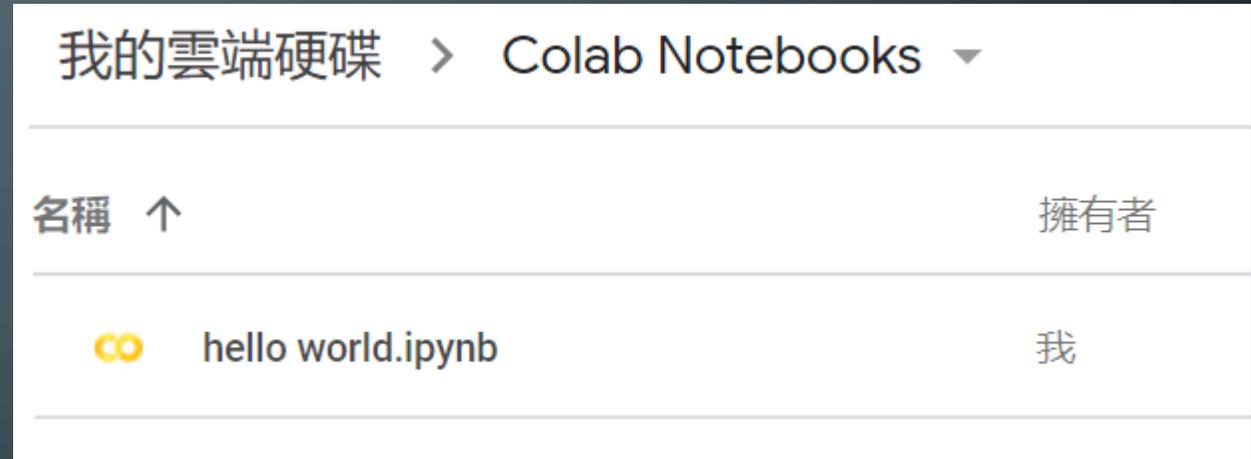
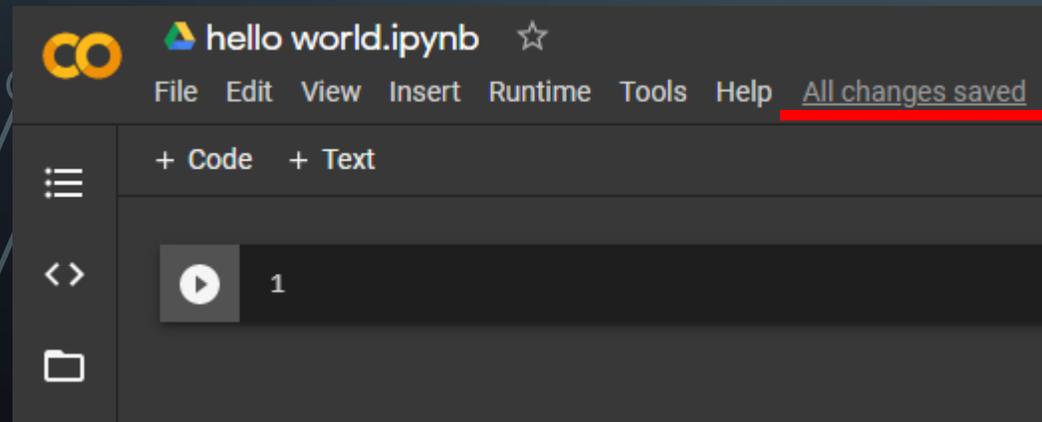
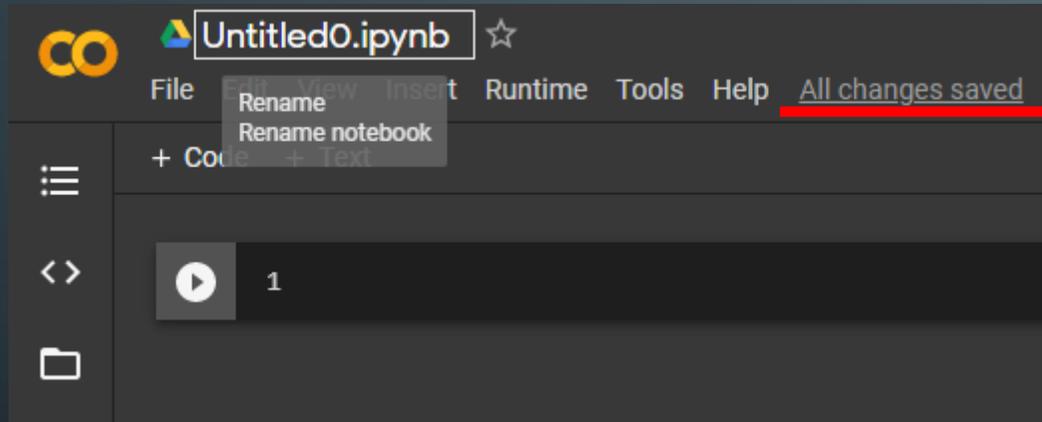
Omit code cell output when saving this notebook

CANCEL SAVE

當滑鼠移到最左上的時候，就能直接對本專案進行重新命名  
並會自動地儲存在你的google drive中

系統會在一小段時間後，自動地幫使用者儲存所有的變更

會把檔案存在google drive → Colab Notebooks中





hello world.ipynb ☆

File Edit View Insert Runtime Tools Help [All changes saved](#)

+ Code + Text

```
[1] 1 x = 1  
    2 y = 2
```

每一格可以輸入程式碼的格子稱為cell

```
[2] 1 z = x + y
```

由上而下，每個cell的運行結果是有記憶連貫性的

```
[3] 1 z
```

所以我們可以在第一個cell初始化x和y的值，在第二個cell將x和y相加，接著在第三個cell將答案印出來

↵ 3

▶ 1

The screenshot shows a Jupyter Notebook interface with the title 'hello world.ipynb'. The 'Runtime' menu is open, displaying various execution options and their keyboard shortcuts. The notebook content includes three code cells:

```
[1] 1 x = 1
     2 y = 2

[2] 1 z = x + y

[3] 1 z
```

The 'Runtime' menu options and shortcuts are:

- Run all: Ctrl+F9
- Run before: Ctrl+F8
- Run the focused cell: Ctrl+Enter
- Run selection: Ctrl+Shift+Enter
- Run after: Ctrl+F10
- Interrupt execution: Ctrl+M I
- Restart runtime...: Ctrl+M .
- Restart and run all...
- Factory reset runtime
- Change runtime type
- Manage sessions
- View runtime logs

要執行單個cell可以按下快速鍵：Shift+Enter

或者是一次要執行所有cell就可以按下：Ctrl+F9  
或用工具列Runtime → Run all



hello world.ipynb ☆

File Edit View Insert Runtime Tools Help [All changes saved](#)

+ Code + Text

```
[1] 1 x = 1  
    2 y = 2
```

```
[2] 1 z = x + y
```

```
[3] 1 z
```

3



1

當然，也能把程式碼放在同一個cell來執行



hello world.ipynb ☆

File Edit View Insert Runtime Tools Help [All changes saved](#)

+ Code + Text

```
[1] 1 x = 1  
    2 y = 2  
    3 z = x + y  
    4 z
```

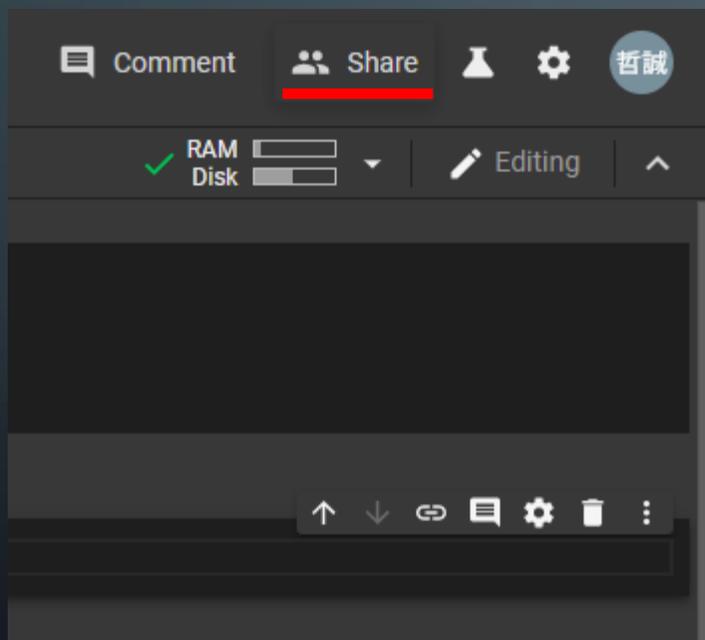
3



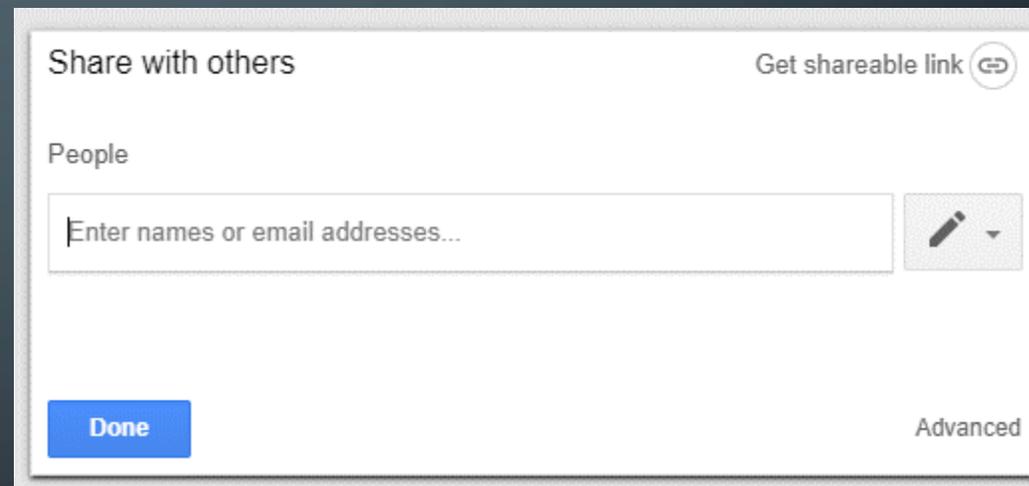
1

只是對於初學者來說，會建議當遇到較大的專案時，能適度地將程式碼分別放到不同的cell，會比較容易閱讀與偵錯

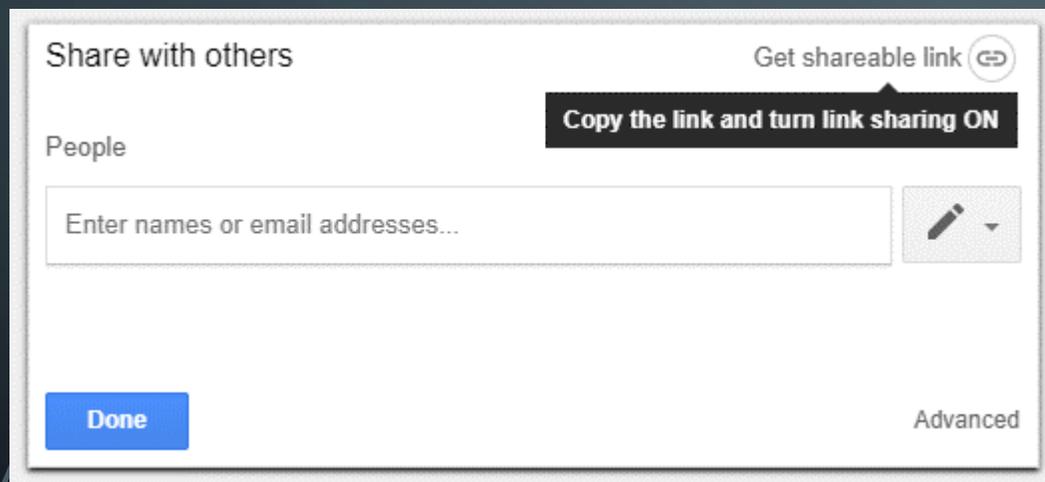
右上方有一個Share的按鈕，這個功能可以讓你分享這個專案給別人（合作開發或求救）



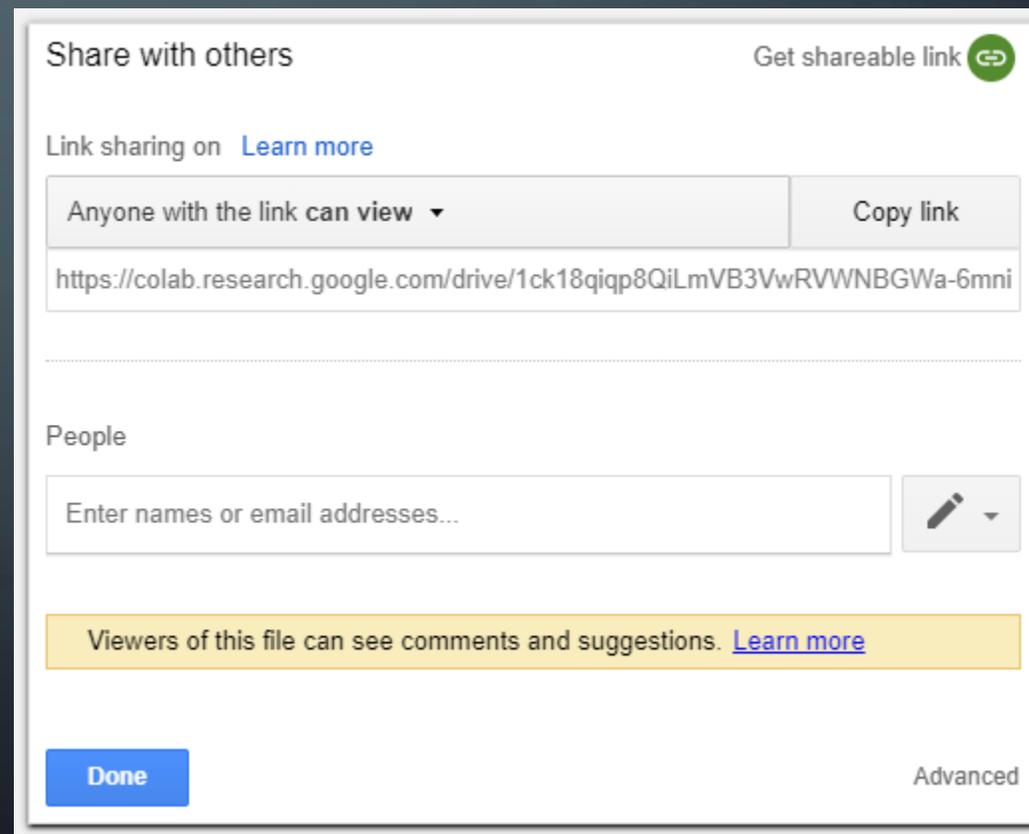
按下去後會跳出一個視窗，跟google drive的分享檔案其實是一樣的



在這邊來簡介其中的一種分享方法，可以按下右上方的Get share link



視窗會變成以下這個樣子，就能進一步地調整成不同的分享模式



接著就能調整Anyone with the link can edit, comment or view

假設我們希望以只能查看的方式分享專案，就設成can view，再按下Copy link，就能將連結/專案分享給朋友了

Share with others Get shareable link

Link sharing on [Learn more](#)

Anyone with the link can view Copy link

OFF - only specific people can access

Anyone with the link can edit

Anyone with the link can comment

✓ Anyone with the link can view

More...

Viewers of this file can see comments and suggestions. [Learn more](#)

Done Advanced

Share with others Get shareable link

Link sharing on [Learn more](#)

Anyone with the link can view Copy link

https://colab.research.google.com/drive/1ck18qiqp8QiLmVB3VwRVWNBGWA-6mni

People

Enter names or email addresses...

Viewers of this file can see comments and suggestions. [Learn more](#)

Done Advanced

接著，我們來簡介一下如何重新開啟專案

由於系統會自動地將專案儲存至你的個人雲端硬碟，所以只要到對應的位置打開專案

接著只要指定使用google colab開啟專案，就能重新還原狀態了

我的雲端硬碟 > Colab Notebooks

名稱 ↑	擁有者
 hello world.ipynb	我

CO 使用「Google Colaboratory」開... ▾

Notebooks ▾

擁有者

我

無法預覽

 下載

 連結更多應用程式...

建議使用下列其中一個應用程式開啟或編輯這個項目

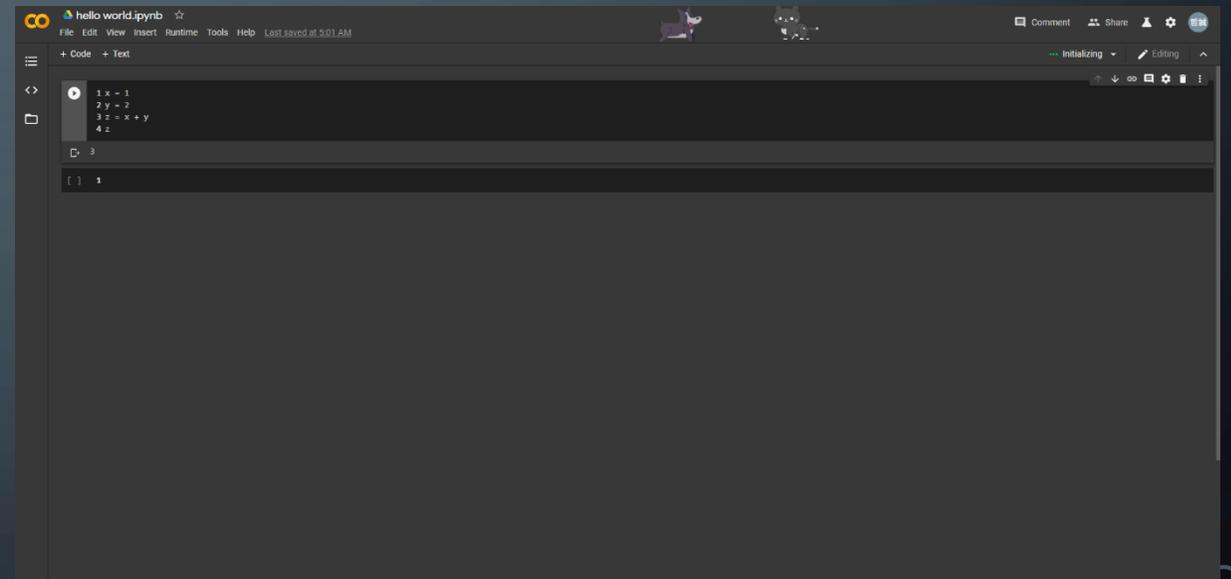
已連結的應用程式

 Google Colaboratory

接著，我們來簡介一下如何重新開啟專案

另外，如果是第一次使用colab，可能會還沒有應用程式連結，所以就點擊上方的按鈕，挑選colab就可以了

所以剛剛的hello world專案就成功還原了

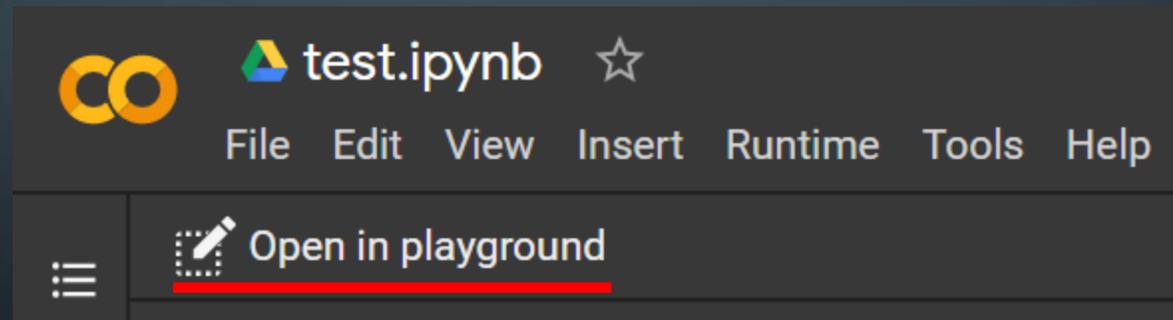


如果專案是別人分享給你的，然後是預設只能查看的話，那要如何編輯跟執行呢？

拿到超連結後，如果直接執行的話，會產生這個訊息，然後仍然無法執行

Running read-only notebooks is not supported. Make a copy of this notebook or switch to playground mode. ✕

所以在執行前，要先按下Open in playground，另開一個分頁，就能正確執行了



如果專案是別人分享給你的，然後是預設只能查看的話，那要如何編輯跟執行呢？

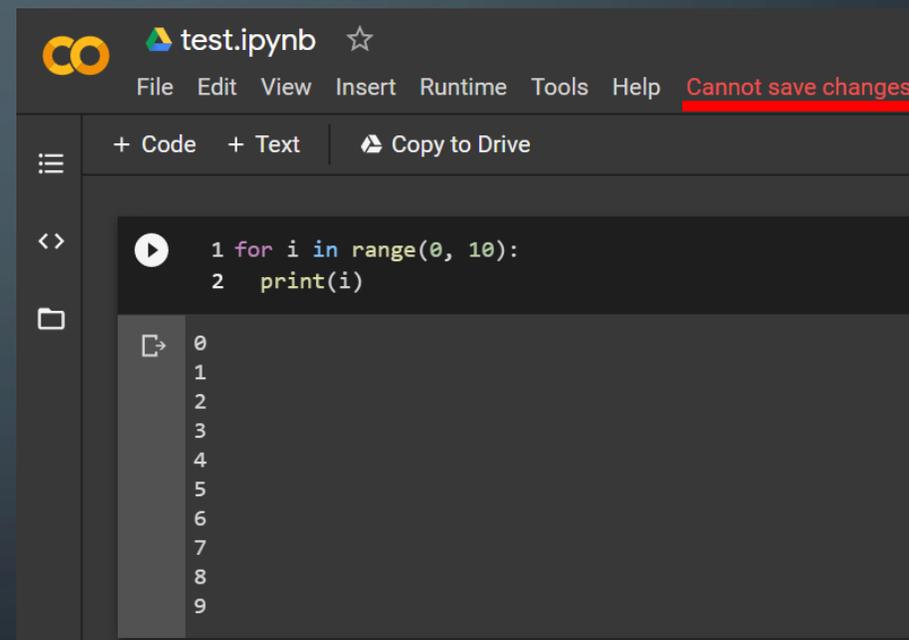
執行的時候，會貼心的提醒你小心程式碼來源及內容

這時候有一個小重點，就是這一份副本其實是沒有自動儲存功能的，也沒有儲到你的個人雲端空間

### Warning: This notebook was not authored by Google.

This notebook was authored by [\[redacted\]](#) @gmail.com. It may request access to your data stored with Google, or read data and credentials from other sessions. Please review the source code before executing this notebook. Please contact the creator of this notebook at [\[redacted\]](#) @gmail.com with any additional questions.

CANCEL RUN ANYWAY



The screenshot shows the Google Colab interface for a notebook named 'test.ipynb'. The top menu bar includes 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. A red warning banner at the top right says 'Cannot save changes'. Below the menu, there are buttons for '+ Code', '+ Text', and 'Copy to Drive'. The main area shows a code cell with a play button icon and the following code:

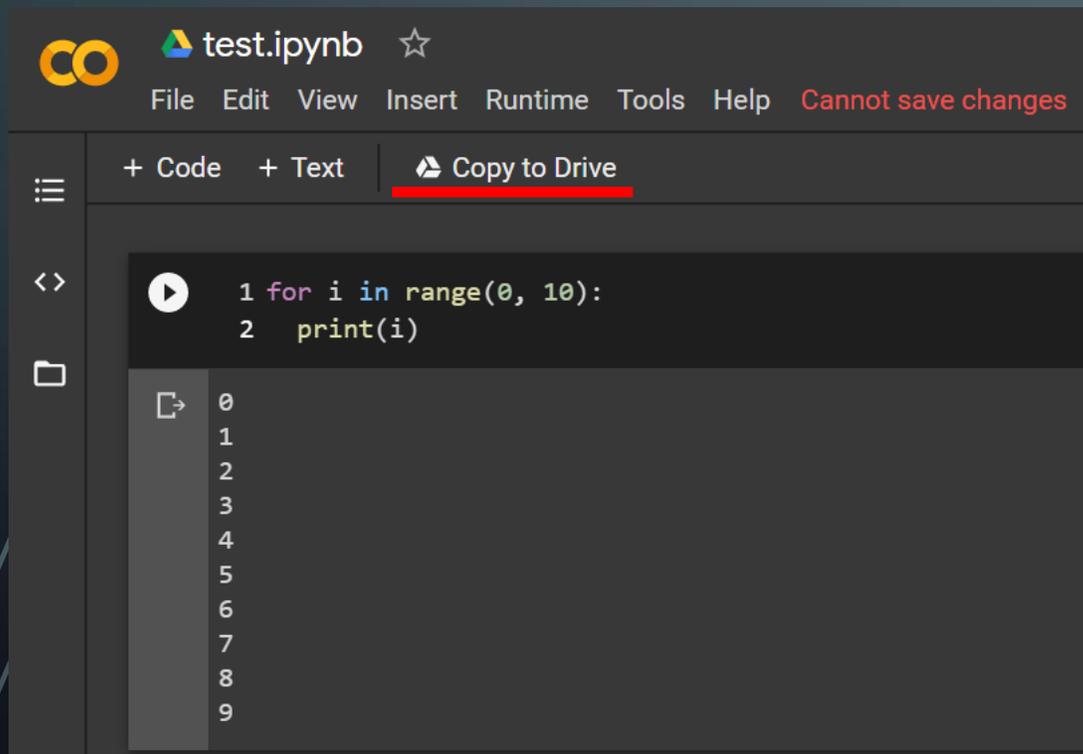
```
1 for i in range(0, 10):  
2   print(i)
```

Below the code cell, the output is displayed as a list of numbers from 0 to 9.

如果專案是別人分享給你的，然後是預設只能查看的話，那要如何編輯跟執行呢？

如果想要可以自動儲存至個人的雲端空間，並有像之前一樣的自動儲存功能的話，就先按下Copy to Drive

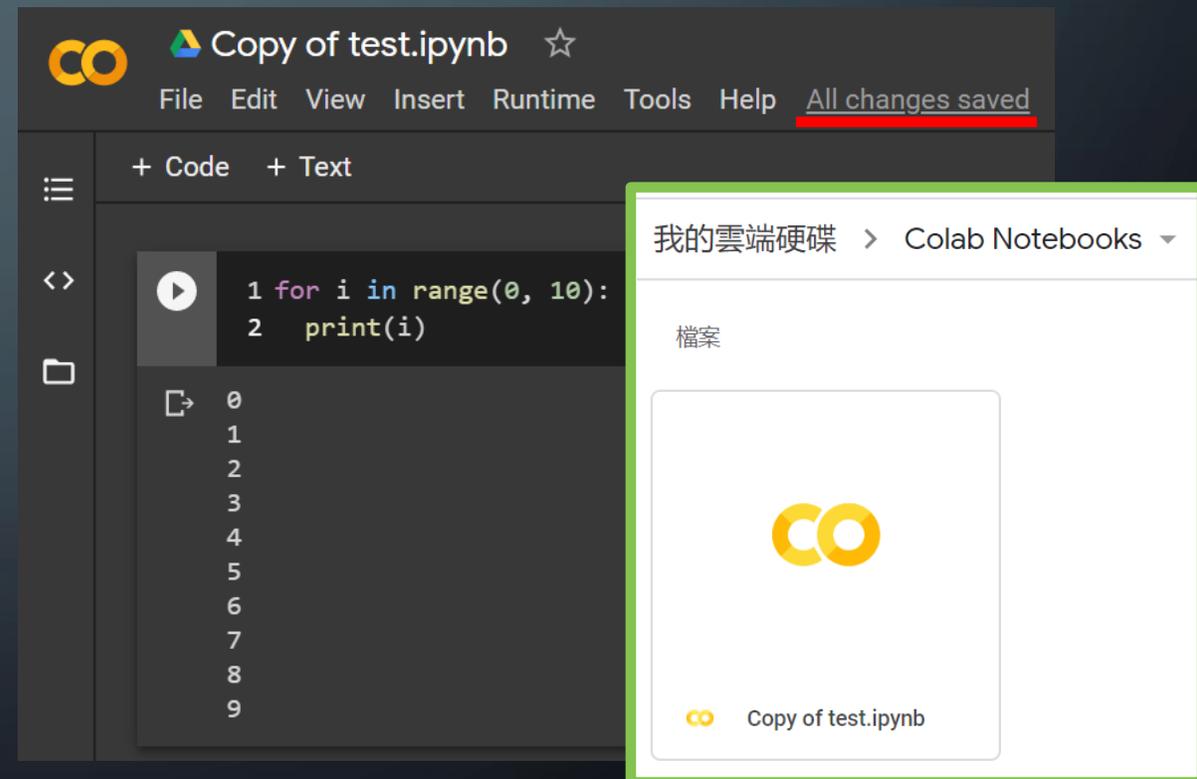
這時候就會存一份副本到你的個人空間，所以自動儲存功能也可以正常運作了



The screenshot shows the Google Colab interface for a notebook named 'test.ipynb'. The top menu bar includes 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', 'Help', and 'Cannot save changes'. Below the menu, there are buttons for '+ Code', '+ Text', and 'Copy to Drive', with the latter being highlighted in red. The main code area contains a Python loop: 

```
1 for i in range(0, 10):  
2   print(i)
```

 Below the code, the output shows the numbers 0 through 9.



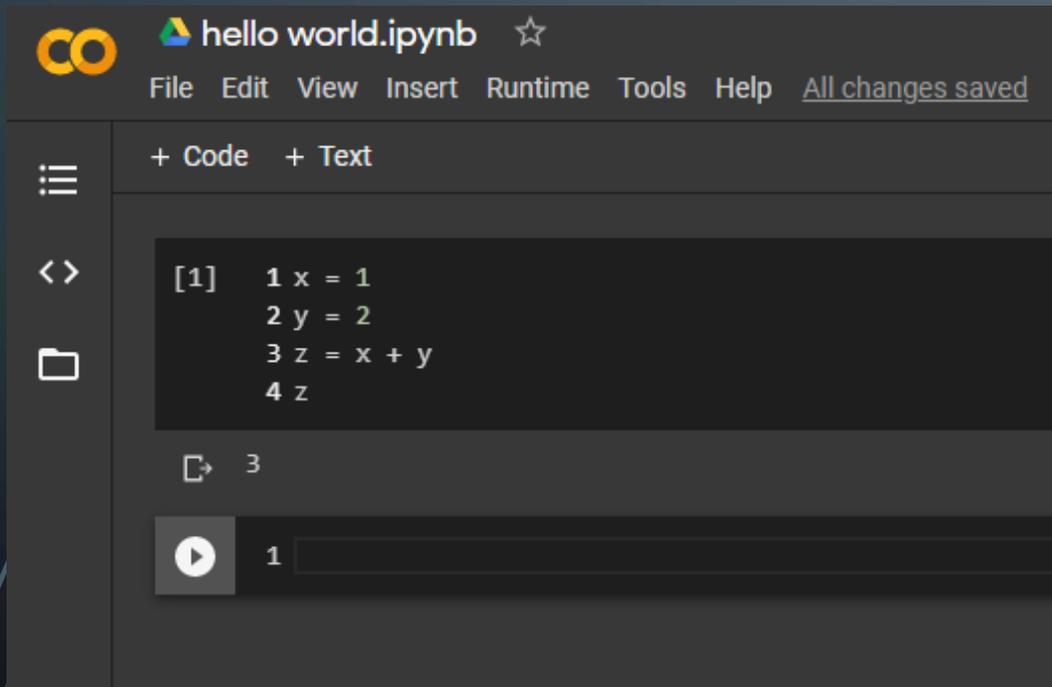
The screenshot shows the Google Colab interface for a notebook named 'Copy of test.ipynb'. The top menu bar includes 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', 'Help', and 'All changes saved'. Below the menu, there are buttons for '+ Code' and '+ Text'. The main code area contains the same Python loop as the previous screenshot: 

```
1 for i in range(0, 10):  
2   print(i)
```

 Below the code, the output shows the numbers 0 through 9. A file explorer window is open on the right, showing the path '我的雲端硬碟 > Colab Notebooks' and a folder named '檔案'. Inside the folder, there is a notebook icon with the Colab logo and the name 'Copy of test.ipynb'.

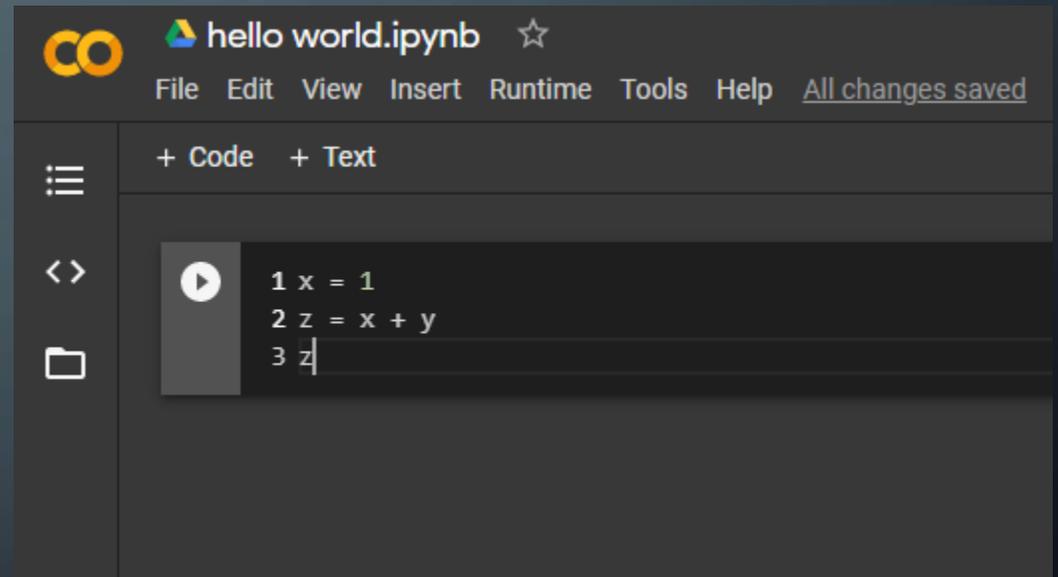
最後，我們來說明一個方便的除錯方法

這個是剛剛可以正常運作的程式碼



```
hello world.ipynb ☆
File Edit View Insert Runtime Tools Help All changes saved
+ Code + Text
[1] 1 x = 1
    2 y = 2
    3 z = x + y
    4 z
3
1
```

這時候如果我們忘了把y做初始化的話，很明顯地就會無法執行專案

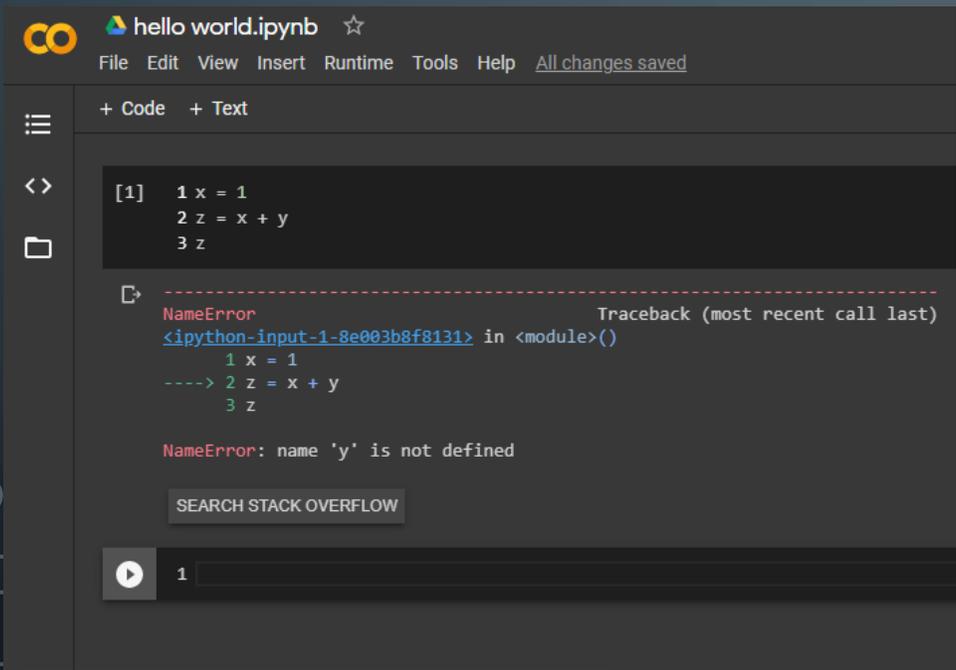


```
hello world.ipynb ☆
File Edit View Insert Runtime Tools Help All changes saved
+ Code + Text
1 x = 1
2 z = x + y
3 z
```

最後，我們來說明一個方便的除錯方法

當產生錯誤時，colab很貼心地會在錯誤程式碼下面產生一個按鈕

按下去後，它就會自動幫你搜尋相關結果，並顯示在新分頁



The screenshot shows the Google Colab interface for a notebook titled "hello world.ipynb". The code cell contains the following Python code:

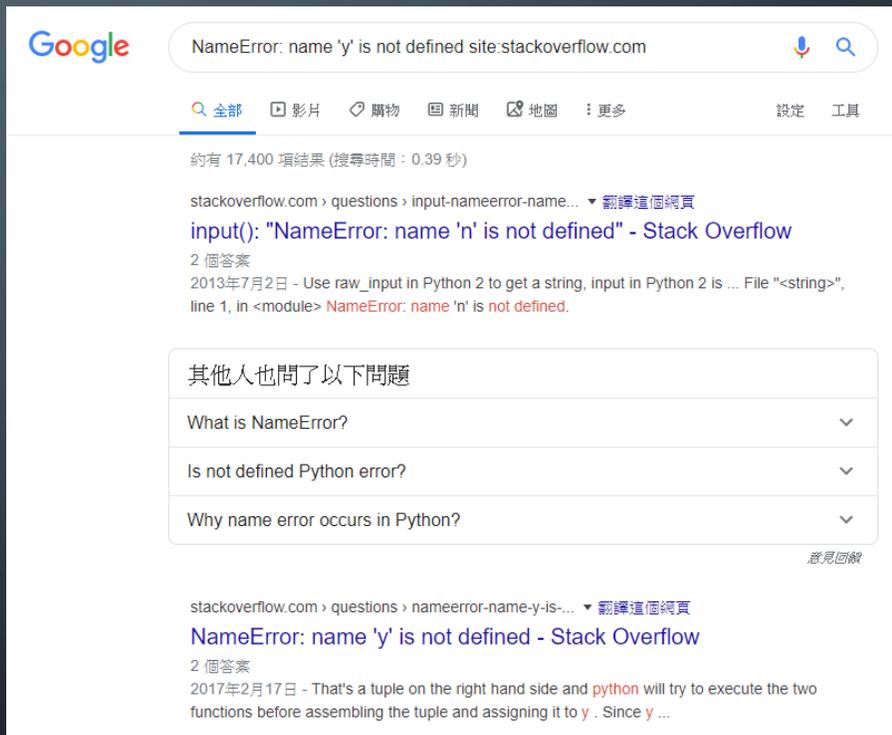
```
[1] 1 x = 1
     2 z = x + y
     3 z
```

Below the code, a red error message is displayed:

```
-----
NameError                                Traceback (most recent call last)
<ipython-input-1-8e003b8f8131> in <module>()
      1 x = 1
----> 2 z = x + y
      3 z

NameError: name 'y' is not defined
```

At the bottom of the error message, there is a button labeled "SEARCH STACK OVERFLOW".



The screenshot shows a Google search result for the query "NameError: name 'y' is not defined site:stackoverflow.com". The search results include:

- 約有 17,400 項結果 (搜尋時間: 0.39 秒)
- stackoverflow.com > questions > input-nameerror-name... [翻譯這個網頁](#)
- [input\(\): "NameError: name 'n' is not defined" - Stack Overflow](#)
- 2 個答案
- 2013年7月2日 - Use raw\_input in Python 2 to get a string, input in Python 2 is ... File "<string>", line 1, in <module> NameError: name 'n' is not defined.

Below the search results, there is a section titled "其他人也問了以下問題" (Other people also asked the following questions) with three dropdown menus:

- What is NameError?
- Is not defined Python error?
- Why name error occurs in Python?

At the bottom, there is another search result for "NameError: name 'y' is not defined - Stack Overflow" with 2 個答案 and a date of 2017年2月17日.

THANK YOU!

The image features the words 'THANK YOU!' in a vibrant, hand-painted style. Each letter is a different color: 'T' is pink, 'H' is green, 'A' is blue, 'N' is red, 'K' is yellow, 'Y' is red, 'O' is pink, and 'U' is green. The letters have a textured, brush-stroke appearance. The text is surrounded by a cloud of small, multi-colored dots (confetti) in shades of red, green, blue, and yellow. There are also several faint, light-blue watermarks of a camera icon scattered around the text.