THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

SCHOOL OF
ENGINEERING

CIVL 4210 – Advanced Construction with AI and Robotics

Guidebook: Setup a Python environment for machine learning

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Unlocking the Power of Google Colab

Google Colab is a **free**, **cloud-based** platform that provides a **complete python environment** for machine learning and data analysis projects.

This guidebook will show you how to get started.

Colab Feature Review: Features You May Have Missed

Step 1: Creating Your Account

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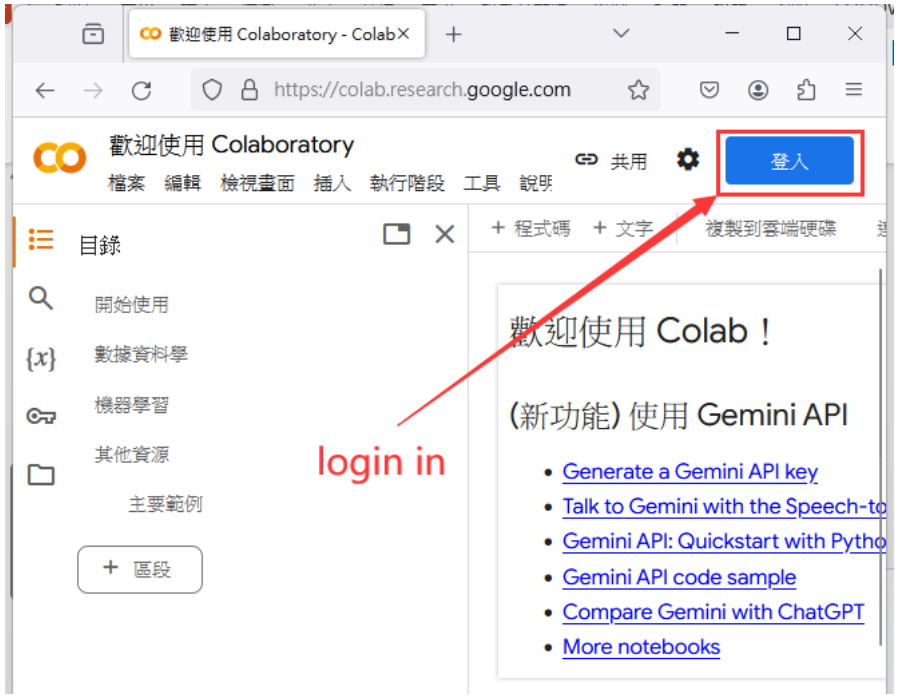
1 Open Google Colab

Open the Google Colab website (https://colab.research.google.com/).

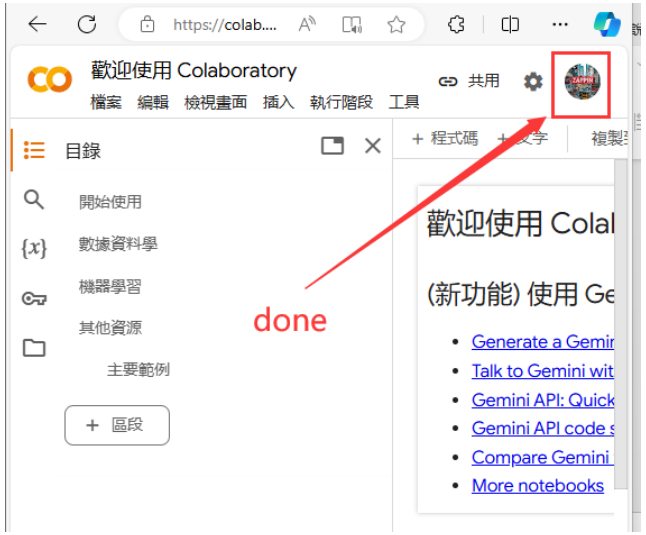


2 Access with Email

Google Colab is fully integrated with Gmail, so you can easily sign in and start using it right away.

3 Complete Registration

Once you're signed in, follow the simple steps to complete your registration and start using Google Colab.



Step 2: Creating a New Notebook

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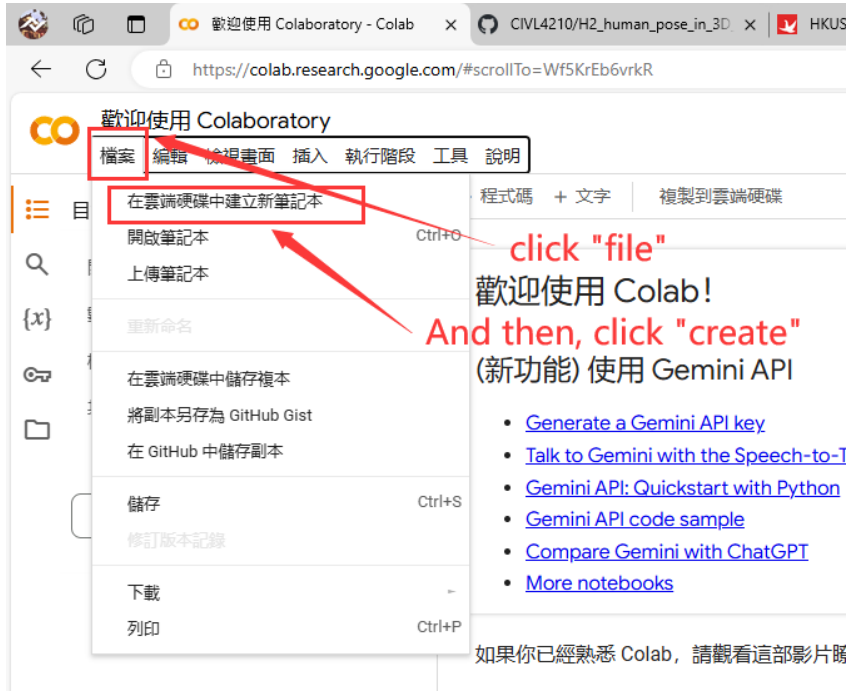
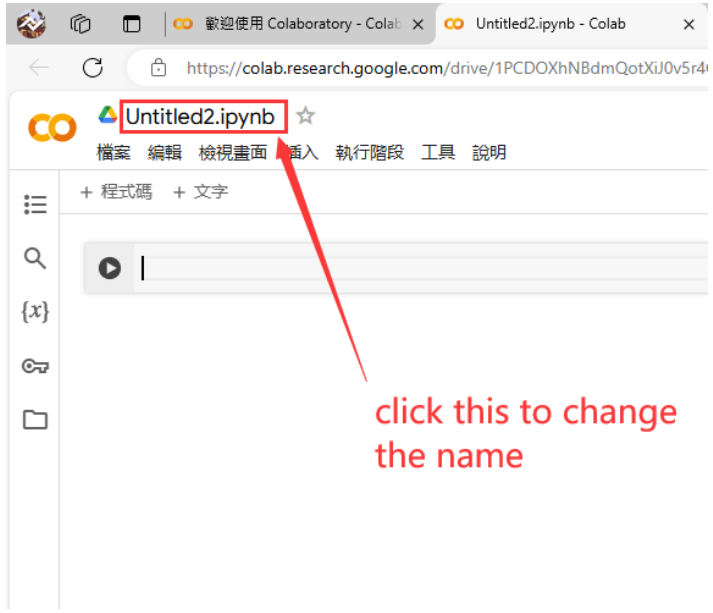
Step 2.1: Click on "New Notebook"

In the dashboard, click on the "New Notebook" button to create a new Colab notebook.



Step 2.2: Give your notebook a name

A dialog box will appear asking you to provide a name for your notebook. Enter a descriptive name that reflects the purpose of your project.



Understanding the Colab Interface

Menu bar

It contains various options for managing and running your notebook, such as saving, running code cells, and changing runtime settings.

Code cell

This is where you can write and run Python code. Each code cell can be run individually.

Text cell

You can add text explanations or notice using text cells. They are useful for providing instructions or adding comments to your code

Step 3: Writing and Running Code

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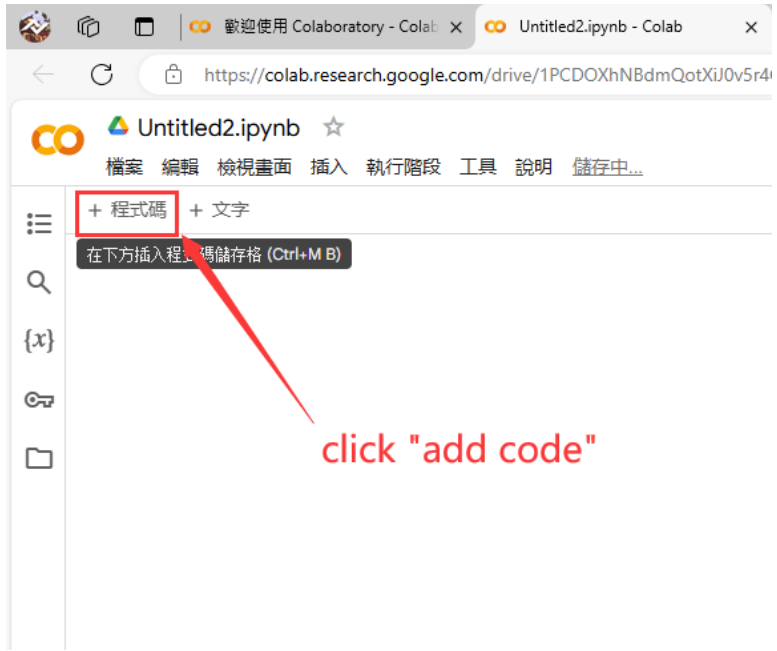
Step 1: Adding a code cell

To add a code cell, simply click on the "+" button in the toolbar.



Step 2: Writing your code

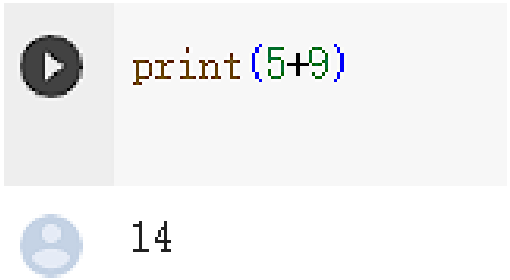
In the code cell, you can write your Python code.

For example
we add 5+9, and we print the rtesult.

print(5+9)

Step 3: Run the code cell

you can click the play button.



Other Methods for Creating a New Notebook

Start from Scratch

Create a new, blank notebook in Google Colab by accessing the Notebook menu.

Open Existing Notebook

If you already have a notebook, you can easily open it in Google Colab by selecting it from your files.

Import form Github

Google Colab makes it easy to import existing notebooks from online websites, such as Github.

Import form Github

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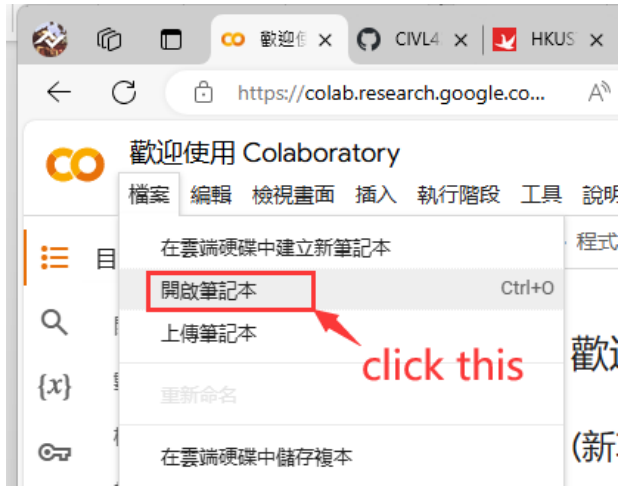
Finding the Code on GitHub

Visit the GitHub website (github.com).
Search for the code repository provided for this lesson.
https://github.com/Yokhong/CIVL4210/

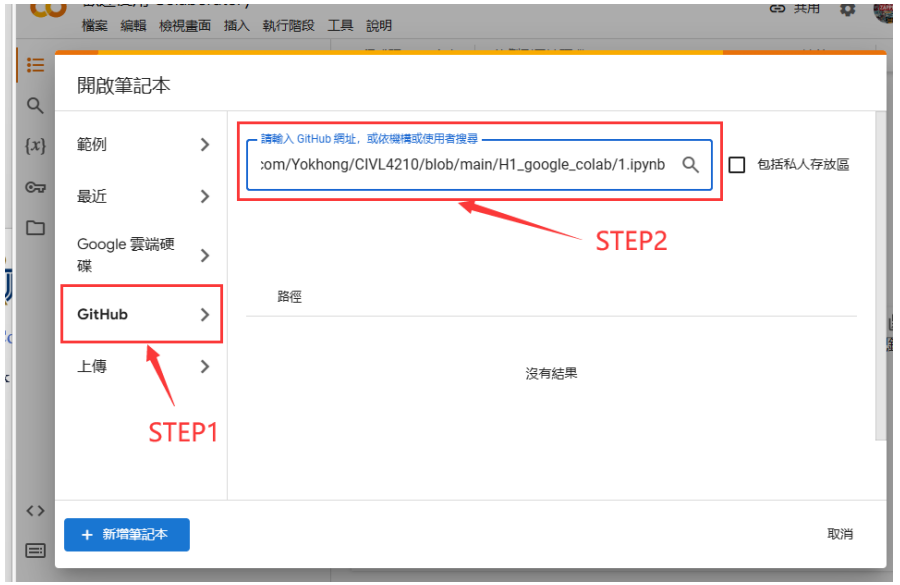


Copying the Repository Link

Once you have found the repository, locate the "Code" button and click on it. Copy the link.

Open the Colab

Open this link from Google Colab.



Running Code in Google Colab

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Step 1： Import model

```
import matplotlib.pyplot as plt
```

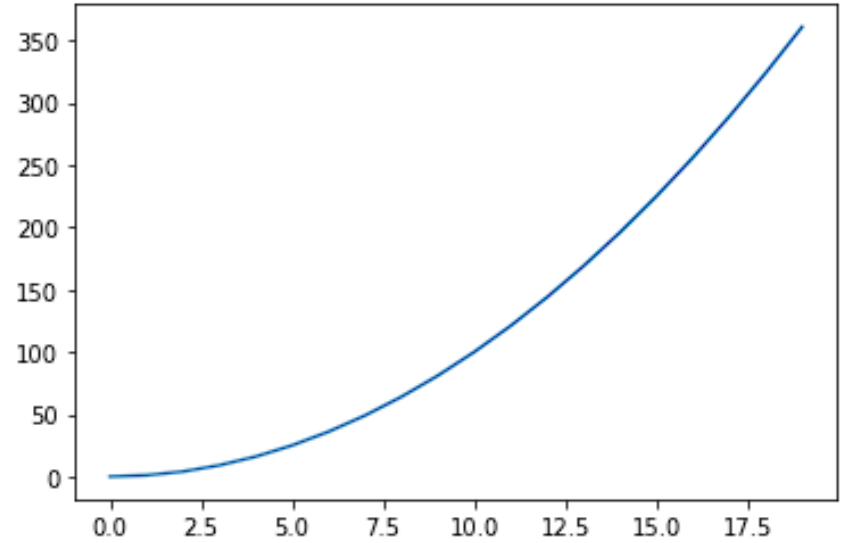
Step 2： Creat array

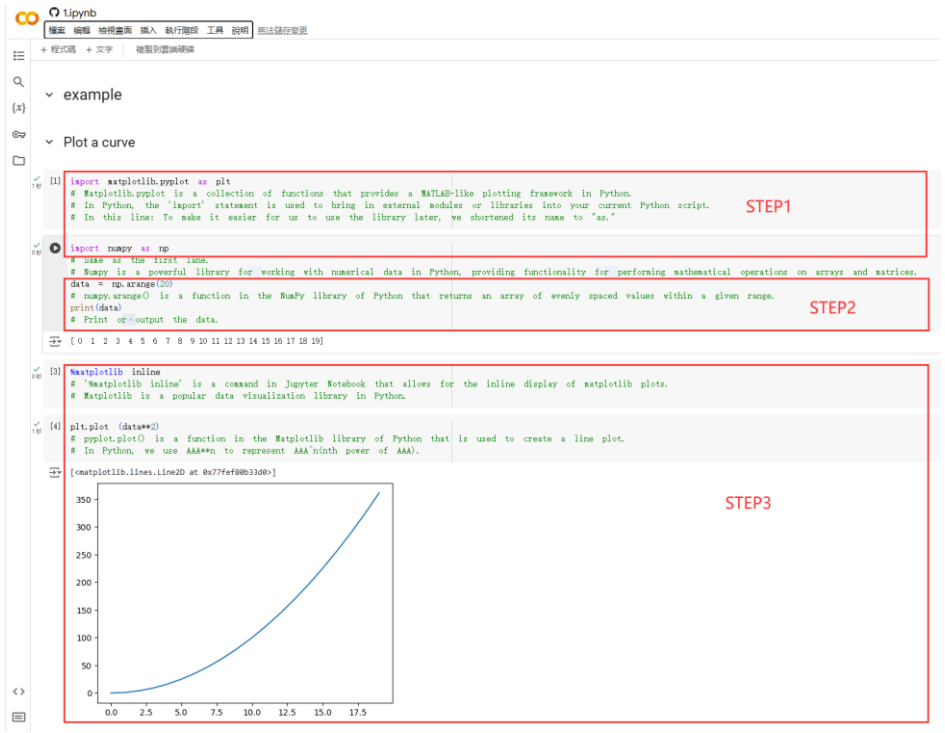
```
import numpy as np
data = np.arange(20)
print(data)
```

Step 3： Draw the squares of array

```
plt.plot(data**2)
```

```
[<matplotlib.lines.Line2D at 0x285965103d0>]
```





https://github.com/Yokhong/CIVL4210/blob/main/H1_google_colab/1.ipynb

Running Code in Google Colab

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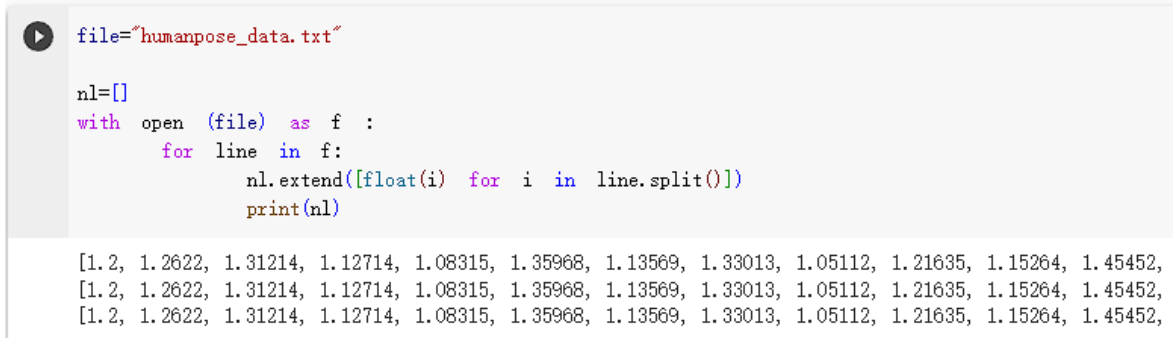
Code cell

```
file="humanpose_data.txt"

nl=[]

with open (file) as f :
    for line in f:
        nl.extend([float(i) for i in line.split()])
        print(nl)
```



```
file="humanpose_data.txt"

nl=[]
with  open  (file)  as  f  :
        for  line  in  f:
                nl.extend([float(i)  for  i  in  line.split()])
                print(nl)
```

```
[1.2, 1.2622, 1.31214, 1.12714, 1.08315, 1.35968, 1.13569, 1.33013, 1.05112, 1.21635, 1.15264, 1.45452,
[1.2, 1.2622, 1.31214, 1.12714, 1.08315, 1.35968, 1.13569, 1.33013, 1.05112, 1.21635, 1.15264, 1.45452,
[1.2, 1.2622, 1.31214, 1.12714, 1.08315, 1.35968, 1.13569, 1.33013, 1.05112, 1.21635, 1.15264, 1.45452,
```

Text cell

First, we need to define our file path so the program can find our file.

We're creating an empty array to hold our data.

Next, we use the OPEN model to read each line of our file and then output it.

We can output our data.

Different data require reading and output methods, and we used the txt format here.