

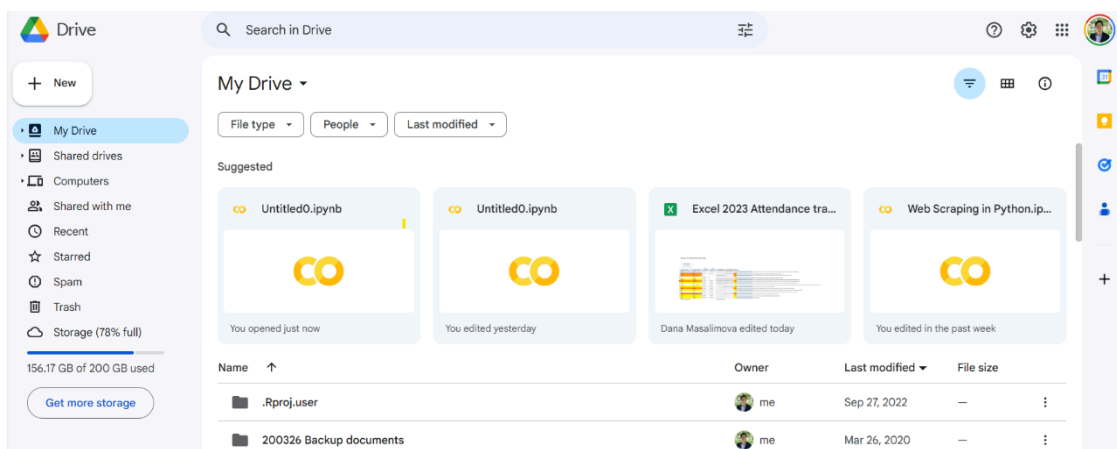
Instructions for Python Labs

Based on work by Quetzali Ramirez Guillen

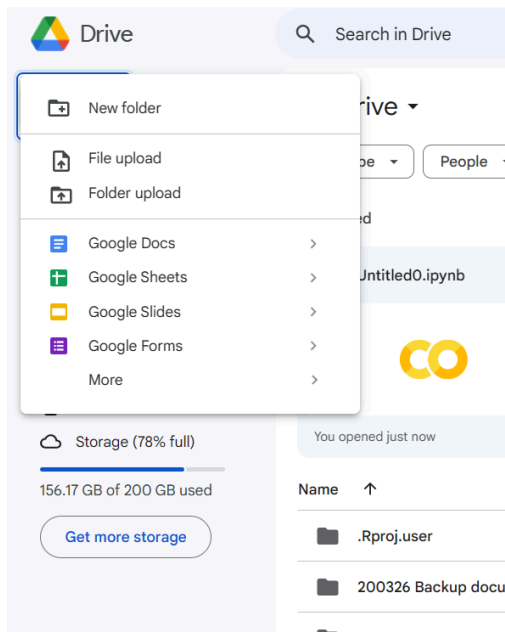
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1. Creating a Google Colaboratory Notebook

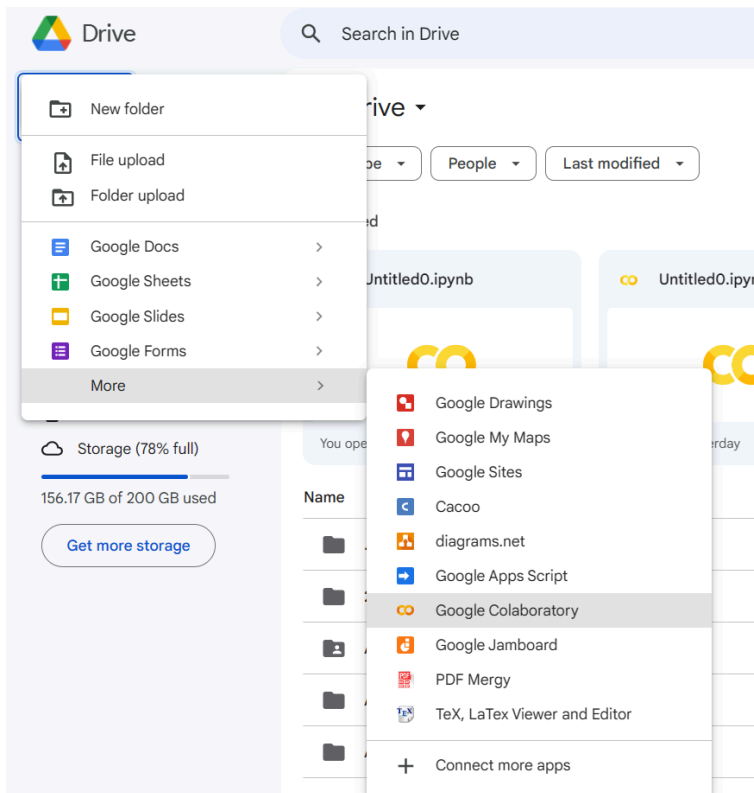
1. Open your internet browser, log in to your Google account, and navigate to [My Drive - Google Drive](#). This will take you to your Drive's homepage.



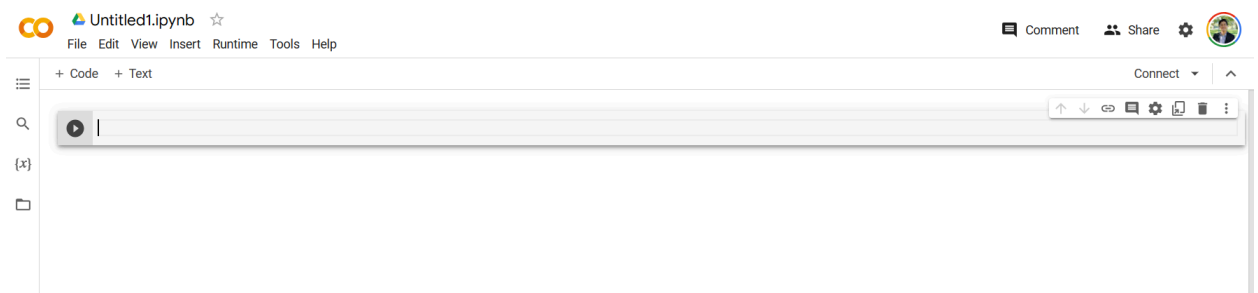
2. On the top-left of the website, click on the "+ New" button. This will open a drop-down menu.



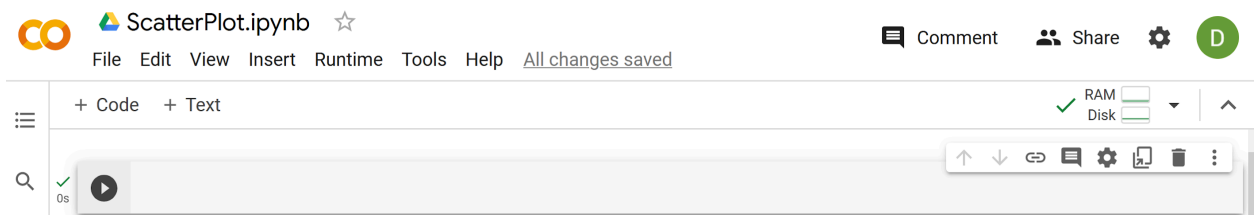
3. At the bottom of the drop-down menu, select "More." This will provide additional options. From these, choose "Google Colaboratory."



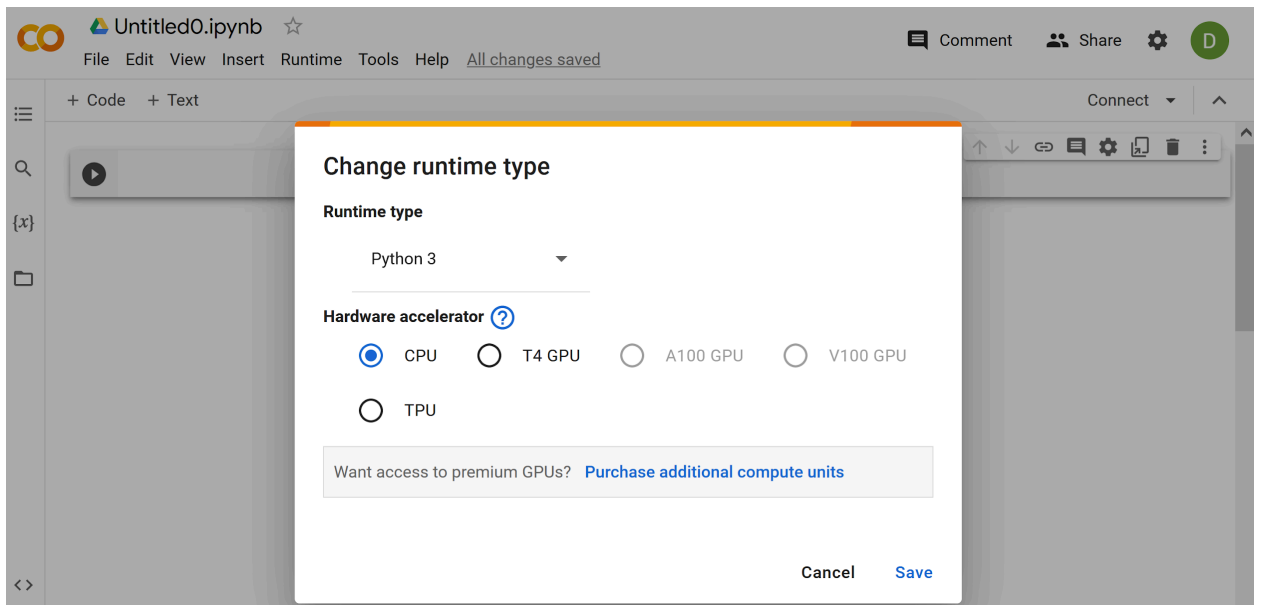
4. You will be directed to a new tab in your browser where you can access an application that allows you to execute Python code in the Colaboratory directly in the browser. It will resemble the following screenshot:



5. Notice the file title at the top-left of the website. Click on the name "Untitled.ipynb" and to rename it—for example to "ScatterPlotAB.ipynb" where AB are your initials.



6. To check that Google Colaboratory is running Python, locate the "Runtime" option in the top row, left half of the screen. Click on it and select "Change runtime type". You should see Python. (This is the default. To change it, pull down the Runtime type menu and save your changes.)



2. Generating code with ChatGPT-4o (or any other LLM)

1. Navigate to ChaptGPT (or any other LLM)
2. If you are going to use data in a csv file, make sure you upload the file into the chat (drag and drop the file).
3. Prompt ChaptGPT to write python code as "Write python code to".

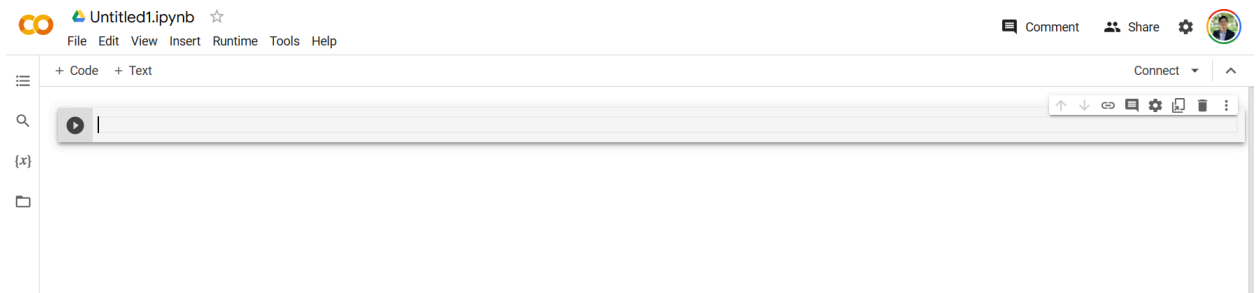
For example, the following screenshot shows the code that chatGPT produced when it was asked to write python code to create a scatter plot of from an uploaded file GiniCO2perCap-22.csv.

```
python Copy code  
  
import pandas as pd  
import matplotlib.pyplot as plt  
  
# Load the CSV file  
csv_file = 'GiniCO2perCap-22.csv'  
data = pd.read_csv(csv_file)  
  
# Extract Gini2022 and CO2022  
gini_2022 = data['gini2022']  
co_2022 = data['CO2022']  
  
# Create scatter plot  
plt.figure(figsize=(10, 6))  
plt.scatter(co_2022, gini_2022, alpha=0.7, edgecolors='w', linewidth=0.5)  
plt.xlabel('CO2 Emissions per Capita in 2022 (Tonnes)')  
plt.ylabel('Gini Index in 2022')  
plt.title('Gini Index vs CO2 Emissions per Capita (2022)')  
plt.grid(True)  
  
# Show plot  
plt.show()
```

4. Copy the code. (Click box at top right corner of black box.)

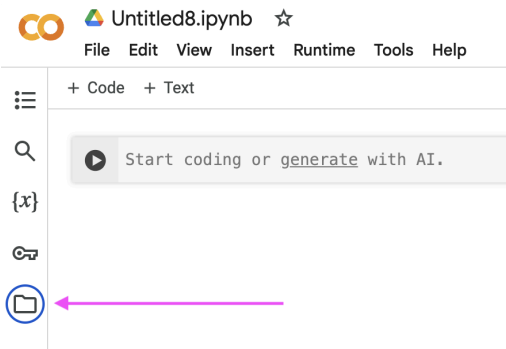
3. Running code with Google Colaboratory

1. Navigate to the Colaboratory. Paste your code into the code box . (Click +Code if it is missing.)



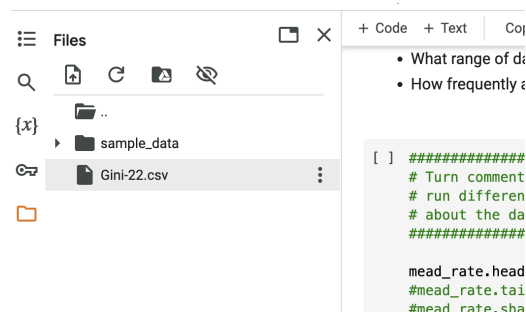
2. Upload your data as a csv file:

- a. Click on the folder icon in left margin. A "Files" panel will appear at the left

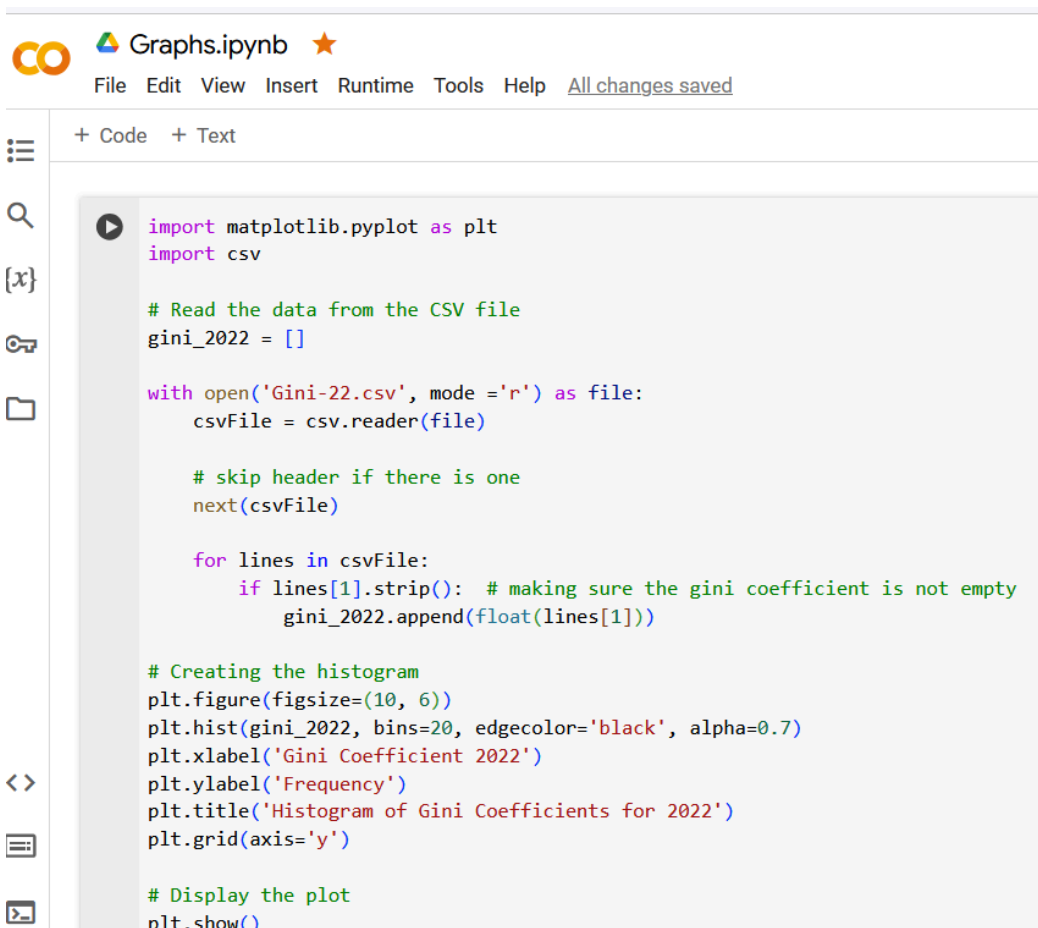


- b. Drag and drop the file into the "Files" panel.

warning: Make sure you DO NOT drag and drop the file into the "sample_data" folder. It should look like this:



3. Paste in your code



4. To run the code, click on black circle containing white triangle at left end of code box. Output appears below code. Running the GiniCO2perCap-22 Python code gives the following scatterplot.

Note: The units on horizontal axis, CO2 emissions in Tonnes, was *not* given in the file. It happens to be correct (data was from gapminder.org) but easily could have been wrong. You need to check everything!

