Setting up the Python Environment

Practical 1 – W1

1. Google Colab – Online
2. Anaconda
3. Local Virtual Environment

1. Google Colab

Colab is like a free online notepad where you can work with your team. It's a bit like how you use Google Docs to edit documents together. In Colab, you can also use different machine learning tools and libraries easily in your notepad.

Why Use Google Colab?

You might wonder, why use Google Colab for machine learning and deep learning? Well, there are several compelling reasons:

- Accessibility
- Ease of Use
- Collaboration and Sharing:
- Integration with Google Drive:
- Pre-installed Libraries:

In a nutshell, Google Colab is an accessible, user-friendly platform that alleviates much of the typical setup pains associated with machine learning and deep learning, leaving you free to focus on what matters most - building and refining your models.

What Colab Offers You?

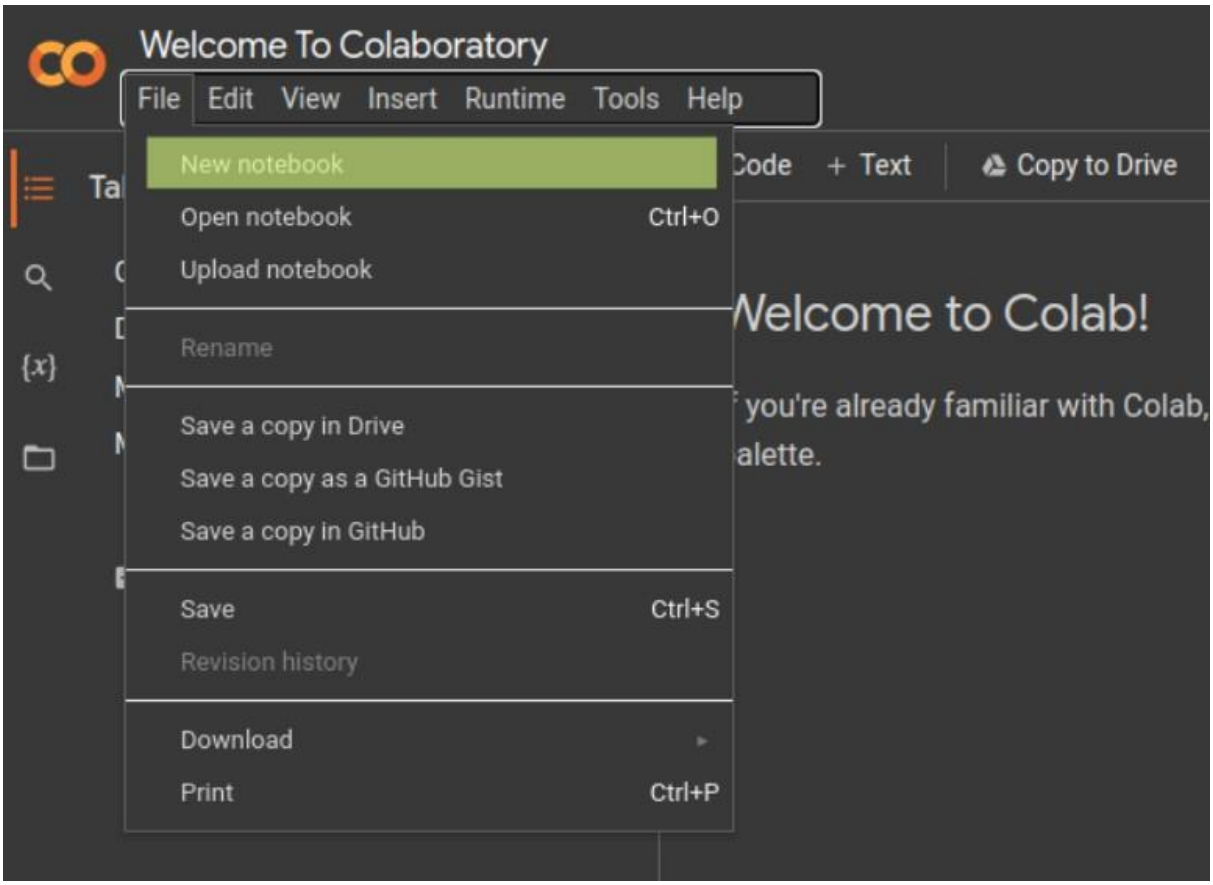
As a programmer, you can perform the following using Google Colab.

- Write and execute code in Python.
- Document your code that supports mathematical equations.
- Create/Upload/Share notebooks.
- Import/Save notebooks from/to Google Drive.
- Import/Publish notebooks from GitHub.
- Import external datasets e.g. from Kaggle.
- Integrate PyTorch, TensorFlow, Keras, OpenCV.
- Free Cloud service with free GPU.

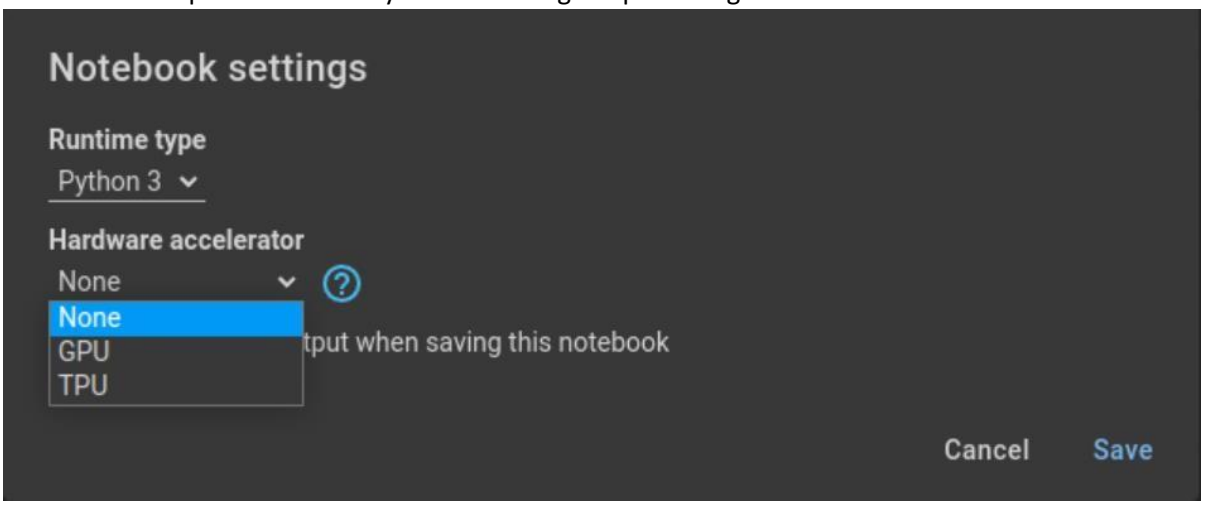
Setting up Google Colab

Since Google Colab runs in the cloud, there's no installation required. All you need is a Google account. Here's how to get started:

1. Open Google Colab: Go to Google Colab (https://colab.research.google.com/) and sign in with your Google account.
2. Create a New Notebook: Once you're on the Google Colab interface, click on File > New notebook to create a new notebook.



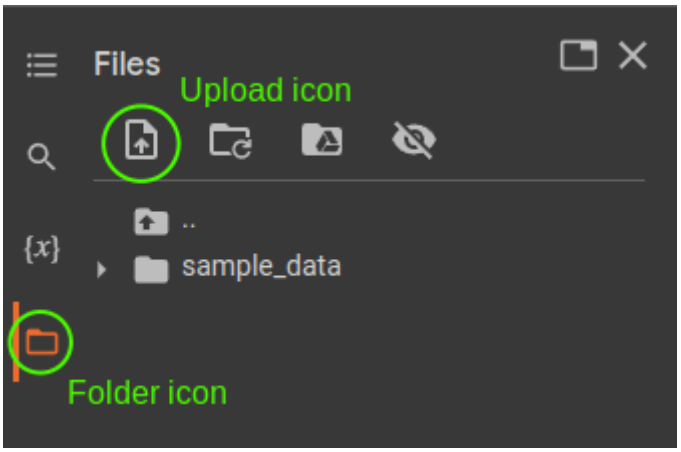
3. Change the Runtime Type: For machine learning / deep learning, you'll want to utilize the power of a GPU. Click on Runtime > Change runtime type and select GPU from the Hardware Accelerator drop-down menu if you are training deep learning models that utilise GPU.



Uploading Files to Google Colab

Before we dive into writing deep learning code, let's talk about how to upload files to Google Colab, which you might need for training models.

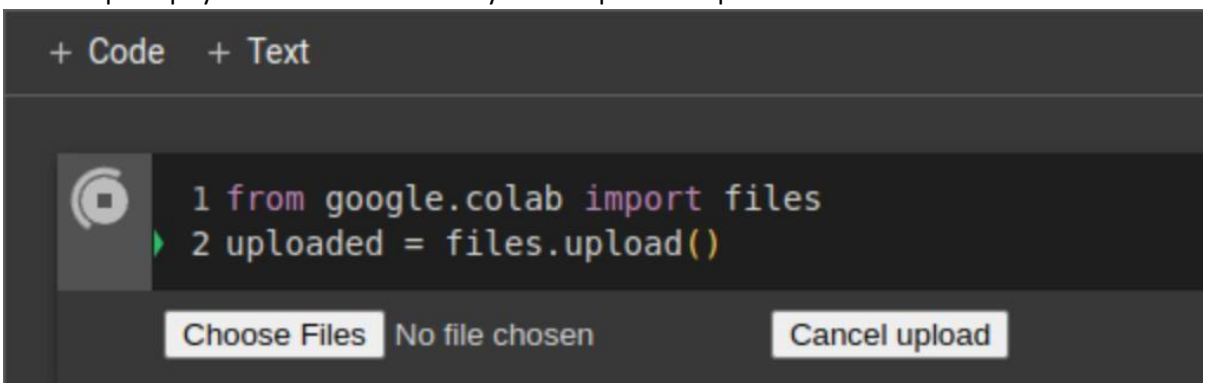
1. Use the File Browser: On the left-hand side, click on the folder icon to open the file browser. You can upload files by clicking on the upload icon.



2. Use Code to Upload Files: You can also use code to upload files. Here's an example using Python:

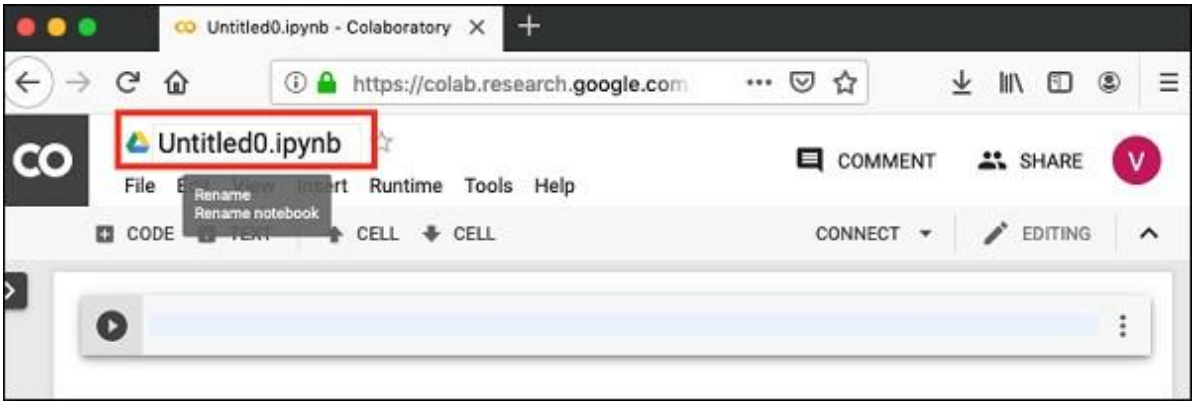
```
from google.colab import files
uploaded = files.upload()
```

This will prompt you to select a file from your computer to upload.



Writing Your First Machine learning / Deep Learning Code

By default, the notebook uses the naming convention UntitledX.ipynb. To rename the notebook,click on this name and type in the desired name in the edit box as shown here.



We will call this notebook as MyFirstColabNotebook. So type in this name in the edit box and hit ENTER. The notebook will acquire the name that you have given now.

Entering Code

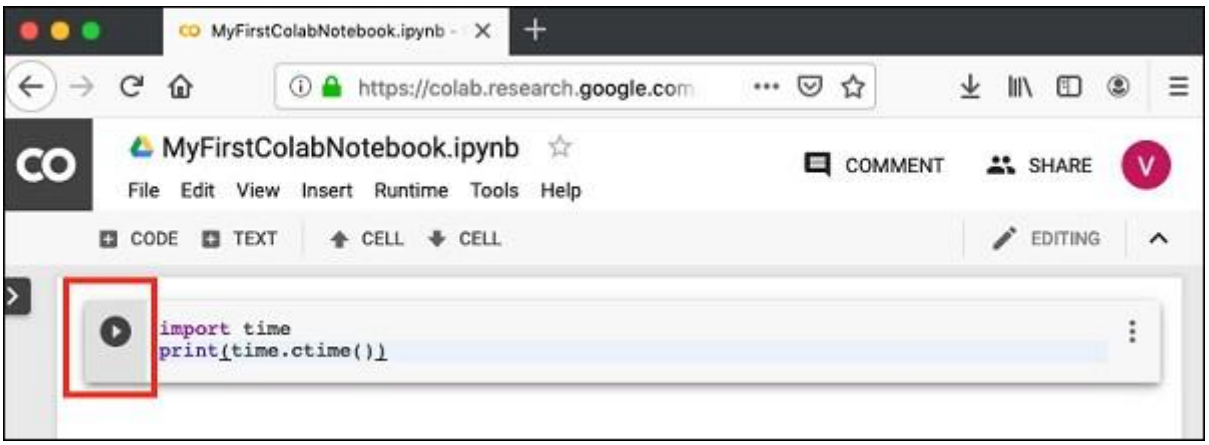
You will now enter a trivial Python code in the code window and execute it.

Enter the following two Python statements in the code window.

```
import time
print(time.ctime())
```

Executing Code

To execute the code, click on the arrow on the left side of the code window.



After a while, you will see the output underneath the code window, as shown here.

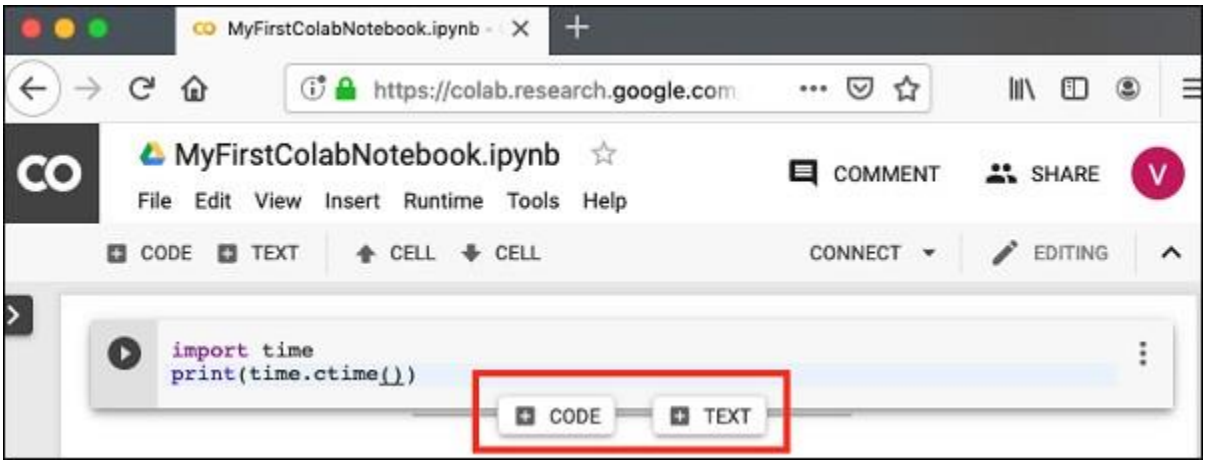
```
Mon Sep 23 02:50:20 2024
```

Adding Code Cells

To add more code to your notebook, select the following menu options.

```
Insert / Code Cell
```

Alternatively, just hover the mouse at the bottom centre of the Code cell. When the CODE and TEXT buttons appear, click on the CODE to add a new cell. This is shown in the screenshot below.



A new code cell will be added underneath the current cell. Add the following two statements in the newly created code window.

```
time.sleep(5)
print (time.ctime())
```

Now, if you run this cell, you will see the following output.

```
Mon Sep 23 02:50:28 2024
```

Certainly, the time difference between the two-time strings is not 5 seconds. This is obvious as you did take some time to insert the new code. Colab allows you to run all code inside your notebook without an interruption.

For more information use the following link

https://www.tutorialspoint.com/google_colab/index.htm

2. Anaconda

Installation instructions on windows:

https://docs.anaconda.com/free/anaconda/install/windows/

3. Local Virtual Environment

Most widely used in the professional setting.

Feel free to use the one drive shared file for creating a local virtual environment on your PC.

Link: Setting Virtual Environment.html