BEGINNER'S GUIDE TO GOOGLE COLAB & JUPYTER NOTEBOOK

What Are Jupyter Notebook and Google Colab?

Jupyter Notebook

- An open-source web application for creating and sharing documents containing live code, equations, visualizations, and text.
- Supports multiple programming languages (Python, R, Julia, etc.).
- Runs locally on your machine (requires installation).

Google Colab (Colaboratory)

- A free, cloud-based version of Jupyter Notebook provided by Google.
- No setup required—runs in your browser.
- Free access to GPUs and TPUs for machine learning tasks.
- Easy sharing and collaboration (like Google Docs).

Getting Started

1. Using Google Colab

✅ **Step 1:** Go to Google Colab
✅ **Step 2:** Sign in with your Google account.
✅ **Step 3:**

- Click **"New Notebook"** to create a blank notebook.
- Or open an existing notebook from GitHub, Google Drive, or your local machine.

2. Using Jupyter Notebook (Local Installation)

✅ **Step 1:** Install Python and Jupyter

pip install jupyterlab

✅ **Step 2:** Launch Jupyter Notebook

jupyter notebook

✅ **Step 3:** A browser window will open—click **"New" > "Python 3"** to create a notebook.

Basic Features & How to Use Them

1. Cells: The Building Blocks

Notebooks are made of **cells** that can contain:

- **Code** (Executable Python code)
- **Markdown** (Formatted text, headings, lists, links, images)

🔹 **Running a Cell:**

- Press **Shift + Enter** or click the **Play** button.

2. Writing and Running Code

```
print("Hello, Colab/Jupyter!")
```

- The output appears below the cell.

3. Using Markdown for Documentation

Switch cell type to **Markdown** and write:

```
# Heading 1

## Heading 2

- List item

**Bold text**

[Google](https://google.com)
```

- Great for notes, explanations, and reports.

4. Keyboard Shortcuts

Shortcut	Action
Ctrl + Enter	**Run current cell**
Shift + Enter	**Run cell & move to next**
Alt + Enter	**Run cell & insert new below**
Esc + A	**Insert cell above**
Esc + B	**Insert cell below**
Esc + M	**Convert cell to Markdown**
Esc + Y	**Convert cell to Code**

5. Saving & Sharing

- **Google Colab:** Automatically saves to Google Drive.
    - Share via **"Share"** button (like Google Docs).
- **Jupyter Notebook:** Save as .ipynb file.

6. Installing Libraries (Colab)

```
!pip install numpy pandas matplotlib
```

- Use ! before shell commands.

7. Using GPU/TPU in Colab (For ML Tasks)

✅ **Step 1:** Go to **Runtime > Change runtime type**
✅ **Step 2:** Select **GPU** or **TPU**
✅ **Step 3:** Verify with:

```
import tensorflow as tf

tf.test.gpu_device_name()
```

Tips for Beginners

- **Use Markdown for clarity** – Document your steps.
- **Restart the kernel if things get stuck** (Kernel > Restart).
- **Download notebooks** (File > Download .ipynb).
- **Use Colab for heavy computations** – Free GPU access!

Conclusion

Google Colab and Jupyter Notebook are powerful tools for coding, data analysis, and machine learning. Colab is great for cloud-based work, while Jupyter is ideal for local development.