Google Colab: Quick Start Guide

Colab is a powerful, free, browser-based tool that allows you to write and execute Python code with no setup. This guide will walk you through the basics of using Colab, including its interface, running code, and helpful shortcuts.

Getting Started with Colab

Accessing Google Colab

1. Go to https://colab.google.com.
2. Sign in with your Google account if prompted.
3. Select **“New Notebook”** to create a new workspace.

Once created, your notebook will automatically save to your Google Drive, so you can access it anytime!

Colab Interface Overview

Key Elements in the Interface

- **Code Cells**: Where you enter Python code. You can run each code cell individually to see the output.
- **Text Cells**: For adding explanations or notes in Markdown. Text cells allow you to document your code and add headings, lists, and more.
- **Toolbar**: Contains options to save, download, add cells, and share the notebook.

Adding Cells

- **To add a new cell**: Click on the **+ Code** or **+ Text** buttons at the top of the notebook.
- **To delete or move cells**: Use the three-dot menu on the left side of each cell.

Running Code in Colab

1. **Enter Code**: Type `print("Hello, world!")` into a code cell.
2. **Run the Code**: Press **Shift + Enter** or click the **Play** button on the left side of the cell.

The output of your code will appear directly below the cell!

Saving, Sharing, and Downloading Your Work

Saving

Colab automatically saves your work to your Google Drive, so you don’t have to worry about manually saving. You can also manually save your progress by selecting **File > Save**.

Sharing

To share your notebook with others:

1. Click the **Share** button in the top-right corner.

2. Adjust sharing permissions to allow others to view, comment, or edit your notebook.
    - **View**: Allows others to see your code and output but not make changes.
    - **Comment**: Allows others to add comments without modifying the content.
    - **Edit**: Allows others to collaborate and make changes to your notebook.

Downloading

If you need to save a copy outside of Google Drive, you can download your notebook in various formats:

1. Go to **File > Download** and select your preferred format:
    - **.ipynb**: The default Jupyter Notebook format, which you can open in Colab or other Jupyter-compatible environments.
    - **.py**: A Python script file, useful if you want to run the code in a standard Python environment outside of Colab.
    - **PDF** or **HTML**: For static versions of your notebook, including both code and output, which is great for sharing final reports.

Keyboard Shortcuts

Using keyboard shortcuts in Colab can speed up your workflow. Here are some of the most useful ones:

- **Run Cell**: `Shift + Enter`
- **Insert Code Cell Above**: `Ctrl + M` then `A`
- **Insert Code Cell Below**: `Ctrl + M` then `B`
- **Delete Cell**: `Ctrl + M` then `D`
- **Convert to Code Cell**: `Ctrl + M` then `Y`
- **Convert to Text Cell**: `Ctrl + M` then `M`
- **Move Cell Up**: `Ctrl + M` then `K`
- **Move Cell Down**: `Ctrl + M` then `J`

To view a full list of shortcuts, press **Ctrl + M, H** within Colab.

Key Elements

- **Indentation Errors**: Python is sensitive to indentation. Make sure your code lines up correctly, especially with loops and functions.
- **Order of Execution**: Cells are executed in the order you run them. If you change a variable in one cell, remember to re-run cells that depend on that variable.
- **Variable Persistence**: Variables are “remembered” across cells, so you can use variables defined in one cell in other cells.

Why We Use Colab

- **No Installation Required**: Colab runs in your browser, so there’s no need to install Python or additional libraries.
- **Pre-installed Libraries**: Colab comes with many popular Python libraries (like NumPy and Pandas), making it ready for engineering applications.
- **Cloud-Based**: Colab provides free access to cloud-based resources, meaning you don’t need a powerful computer to run complex code.