Getting Starting with Google's Colaboratory

Colab is a *free* way that you can collaborate with your peers on a document that allows you to combine Python code with rich text. The main benefits of Colab include:

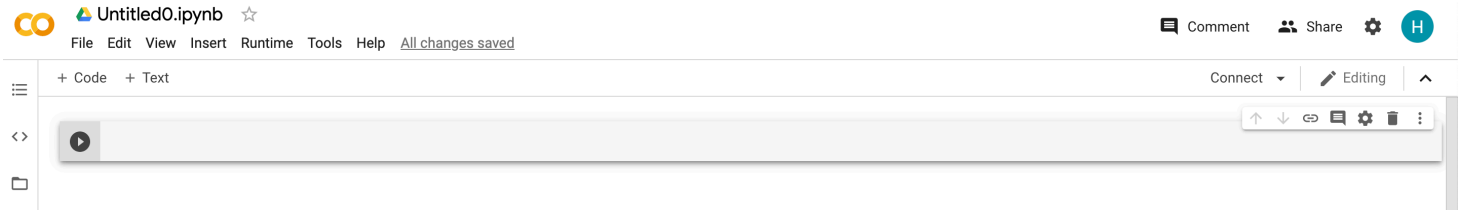
- **No** configuration necessary i.e. you don't need to download/install anything to your machine
- Works seemlessly with Google Drive

Resource: Here is a short video that gives a nice introduction to Colab's basic features.

All the tips and tricks on how to use Jupyter notebooks we outlined in our other document *getting-started-with-jupyter-notebooks* translates to Google Colab. However as most of you will be using Colab for your assignments, we will go over this software in more detail in addition to covering a few specific features to Colab.

Working in the Colab Environment

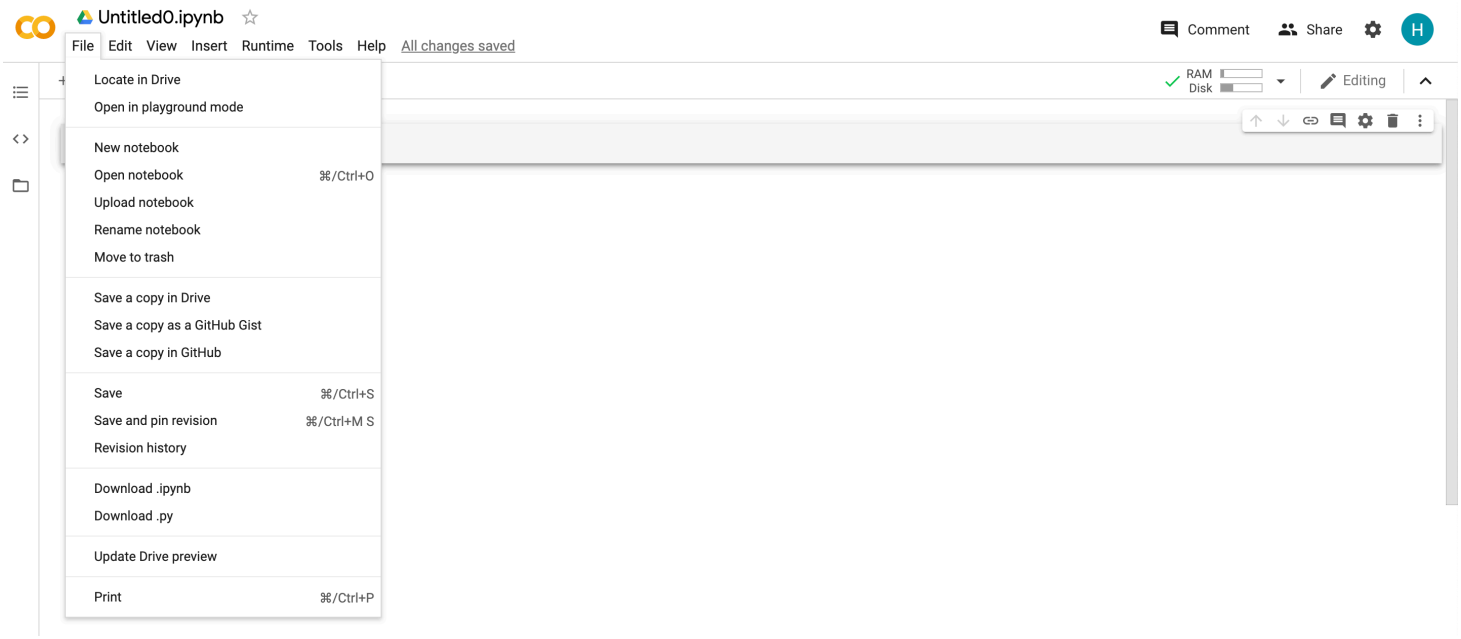
When you open up a new notebook in colab, you will find yourself here:



Some Notes on the Dropdown Options

In this section we will go over four of the dropdown menus and what options will be most common/useful for you. Many of these are similar to what you would find on software like Word/Excel/Powerpoint.

File

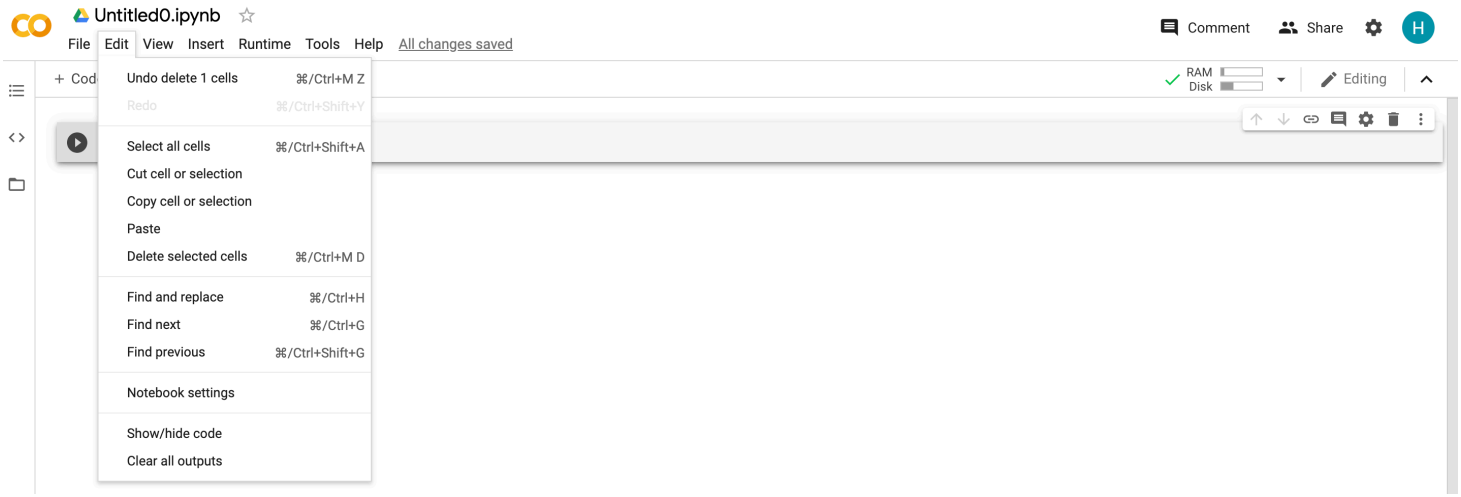


The `File` dropdown menu will allow you to do basic functions such as:

- Create, open, rename, or delete a notebook
- Save the notebook
- View the revision history (can be very handy if you make one change that creates all sorts of errors)
- Download as a separate file in either notebook format (.ipynb) or as a Python script (.py)

Note: You can rename the notebook by clicking on the title - in our case *Untitled0.ipynb*.

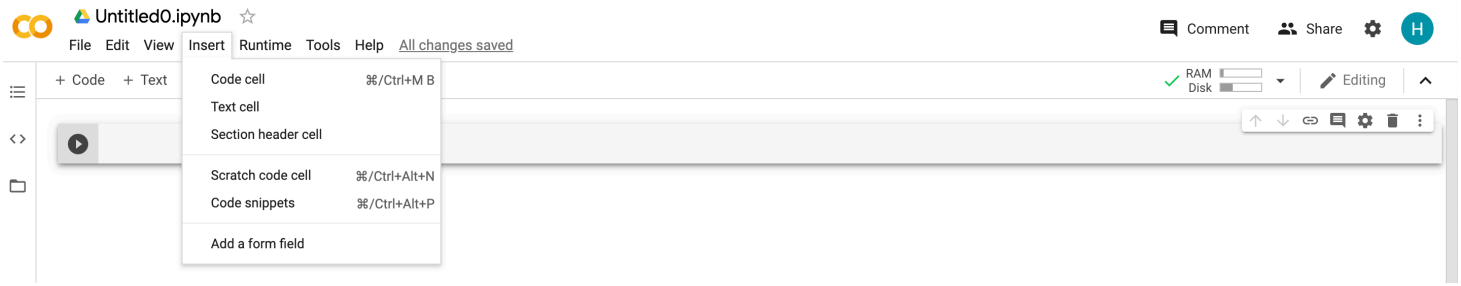
Edit



The `Edit` dropdown contains three of the more common editting tools. You might want to familiarize yourself with the keyboard shortcuts for these (especially for `Undo` and `Delete selected cells`).

- Undo will reset the last change you just made i.e. go backward in revision history
- Redo is the opposite of undo i.e. go forward in your revision history (if possible)
- Delete will remove the currently selected cell

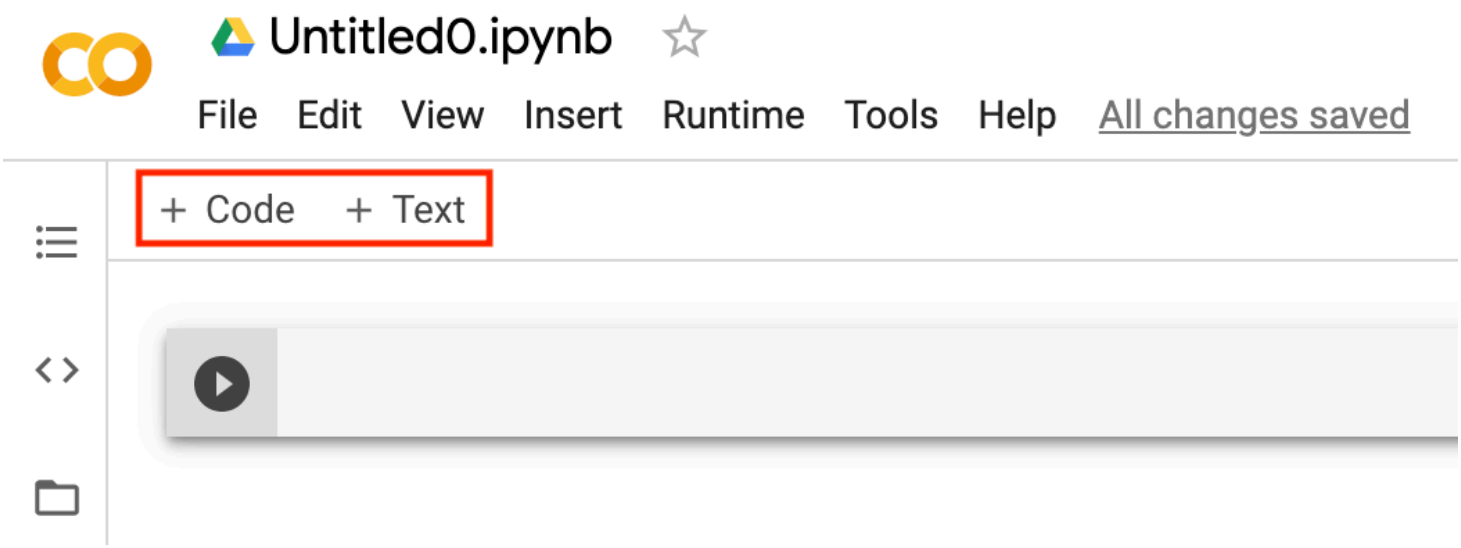
Insert



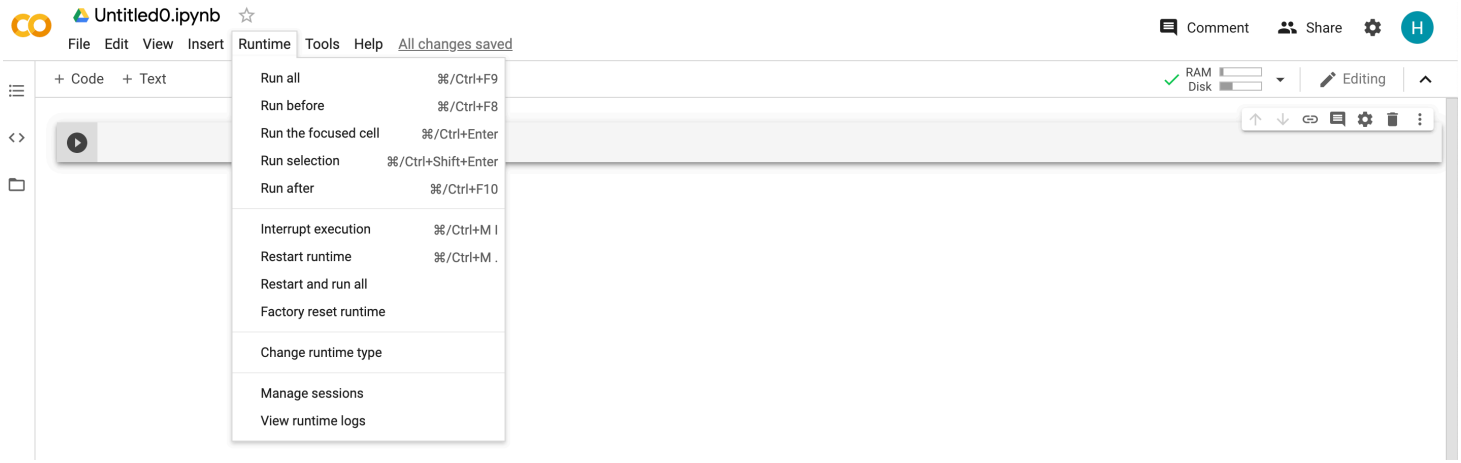
The `Insert` dropdown menu is one you most likely will **not** need since the two main functions can be accessed elsewhere.

- Choosing `Code cell` will insert a new **code** cell beneath the cell you currently have selected
- Choosing `Text cell` will insert a new **text** cell beneath the cell you currently have selected

Note: You can easily insert code and text cells by choosing the options directly under the dropdown menus.



Runtime



The `Runtime` menu has a few useful options that will primarily save you time.

- You can run all cells, all cells above the currently selected cell, and all the cells after the currently selected cell
- If you ever get stuck in a lengthy execution or infinite loop, you can interrupt the execution
- Sometimes you might want to restart the notebook which clears all the previously saved variables

Using Cells

Blank text and code cells are noticeably different. Text cells will appear filled, prompting you to double click them to edit while code cells will be blank but contain two square brackets at the far left end of the cell:

Double-click (or enter) to edit

```
[ ]
```

To **edit** either type of cell, you simply need to double click the cell.

To **execute** the cell, the simplest way is to press `shift` + `enter` on your keyboard

Text Cells

Text cells support the Markdown markup language in addition to some basic HTML commands. You won't need to learn Markdown of HTML in order to complete your assignments, and other than simple notes you want to provide to us on your assignments, you won't be using these types of cells too often.

Treat them like simple text-editing software like NotePade or TextEdit. You have a few options at the top including (from left to right):

- Headings
- Bold format
- Italics format
- Code format
- Inserting a hyperlink
- Inserting an image
- Changing indents
- Adding numbered and/or bulleted lists
- [Two other options that you won't be needing]

Inserting an Image

The most important tool for your purposes will most likely be inserting and image. To do so, click the insert image icon, navigate to the file you want to insert, and click ok. When you do this, Colab will format the image with a crazy, long string of letters and numbers. My advice is to simply click `shift` + `enter` to run the cell and continue with any other text you need below in a new cell.

Coding Cells

Coding cells will be the bread-and-butter of what you use for these assignments. Again, we won't be diving too heavily into programming in Python, but use simple variables and arithmetic to solve your problems - think of these cells as glorified calculators.

We have an entire other reference document for you to look at that will help you with the basics of coding - not to mention the Internet has MANY sources online for getting started with Python.

Final Notes

We hope you embrace and enjoy the opportunity to get to use a neat tool like iPython notebooks and embellish your coding abilities in Python. If you have any questions regarding iPython notebooks, Google Colab, or programming in Python, please don't hesitate to ask your TAs or instructor.