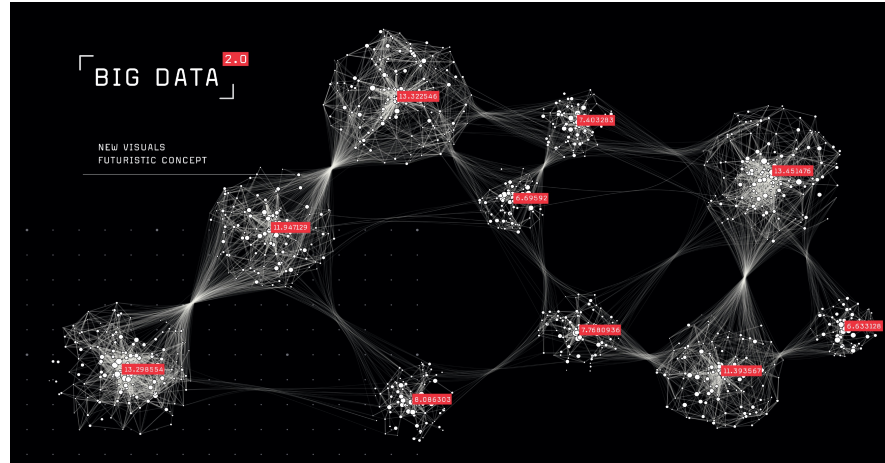




Data Science in Action using Python

An AAI Artificial Intelligence– Technical Track Course



Setup Sandbox

Google Colab Installation and Setup



Google Colab Setup

1. Access Google Colaboratory
2. Google Drive for data files
3. Upload Sandbox files to Google Drive
4. "Hello World" notebook

The screenshot shows the Google Colaboratory interface. At the top, there's a navigation bar with the Google Colaboratory logo and the text 'Welcome To Colaboratory'. Below this, there's a menu with options like 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. On the left side, there's a 'Table of contents' panel with a search icon and a list of items: 'Getting started', 'Data science', 'Machine learning', 'More Resources', 'Machine Learning Examples', and 'Section'. The main content area has a heading 'What is Colaboratory?' and a sub-heading 'Getting started'. The 'Getting started' section contains text explaining that Colaboratory is an interactive environment for writing and executing code. It includes a code cell with a Python script that calculates the number of seconds in a day (24 * 60 * 60) and prints the result (86400). Below the code cell, there's text explaining how to execute the code and how to edit it. The code cell is highlighted with a light blue background.



Access Google Colab

The screenshot shows the Google Colab interface. A black arrow points from the URL bar to the address `colab.research.google.com/notebooks/intro.ipynb?utm_source=scs-index`. A yellow box with the text "Go to colab.research.google.com" has an arrow pointing to the URL bar. Another yellow box with the text "Markups" has an arrow pointing to the "Getting started" section. A third yellow box with the text "Coding cell" has an arrow pointing to a code cell containing Python code. The code cell shows the calculation of seconds in a day: `seconds_in_a_day = 24 * 60 * 60` followed by `seconds_in_a_day` and the output `86400`.

Go to colab.research.google.com

Markups

Coding cell



Access Google Colab

Data science

With Colab you can harness the full power of popular Python libraries to analyze and visualize data. The code cell below uses **numpy** to generate some random data, and uses **matplotlib** to visualize it. To edit the code, just click the cell and start editing.

Import Python library

Plot x,y

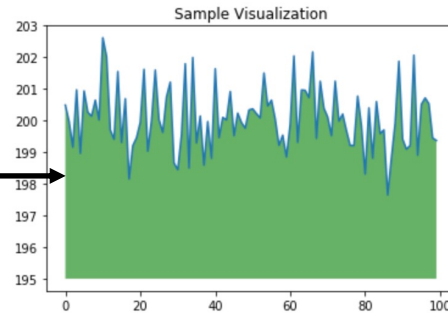
Plot results

```
[ ] import numpy as np
    from matplotlib import pyplot as plt

    ys = 200 + np.random.randn(100)
    x = [x for x in range(len(ys))]

    plt.plot(x, ys, '-')
    plt.fill_between(x, ys, 195, where=(ys > 195), facecolor='g', alpha=0.6)

    plt.title("Sample Visualization")
    plt.show()
```






Access Google Colab

More Resources

Working with Notebooks in Colab

Import Python library

- [Overview of Colaboratory](#)
- [Guide to Markdown](#)
- [Importing libraries and installing dependencies](#)
- [Saving and loading notebooks in GitHub](#)
- [Interactive forms](#)
- [Interactive widgets](#)
-  [TensorFlow 2 in Colab](#)

Working with Data

- [Loading data: Drive, Sheets, and Google Cloud Storage](#)
- [Charts: visualizing data](#)
- [Getting started with BigQuery](#)

Google Drive for Data Files

The image shows a screenshot of the Google Drive web interface with several annotations. A yellow box labeled "Go to Google drive" points to the address bar containing "drive.google.com/drive/my-drive". A yellow box labeled "Click new" points to the "New" button in the top-left navigation area. A yellow box labeled "Choose new folder" points to the "New folder" option in the dropdown menu. A yellow box labeled "Type COVID_Project" points to the text input field in the "New folder" dialog box, which contains the text "COVID_Project". The "New folder" dialog also shows "CANCEL" and "CREATE" buttons.

drive.google.com/drive/my-drive

Go to Google drive

Drive Search in Drive

New

My Drive

Shared with me

Recent

Starred

Trash

Storage

168.2 MB of 15 GB used

Buy storage

My Drive

New folder

Upload files

Upload folder

Google Docs

Google Sheets

Google Slides

Google Forms

More

New folder

COVID_Project

CANCEL CREATE

Click new

Choose new folder

Type COVID_Project



Google Drive for Data Files

← → ↻ drive.google.com/drive/my-drive

Drive Search in Drive

New

- My Drive
- Shared with me
- Recent
- Starred
- Trash

Storage

168.2 MB of 15 GB used

Buy storage

My Drive ▾

Folders

- COVID_Project

COVID_Project

← → ↻ drive.google.com/drive/folders/1jIMkyRD2psZAFjsZI-qR9PBzisBNBcKX

Drive Search in Drive

My Drive > COVID_Project ▾

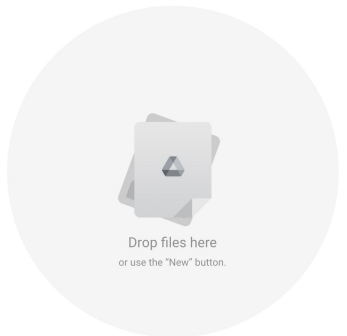
New

- My Drive
- Shared with me
- Recent
- Starred
- Trash

Storage

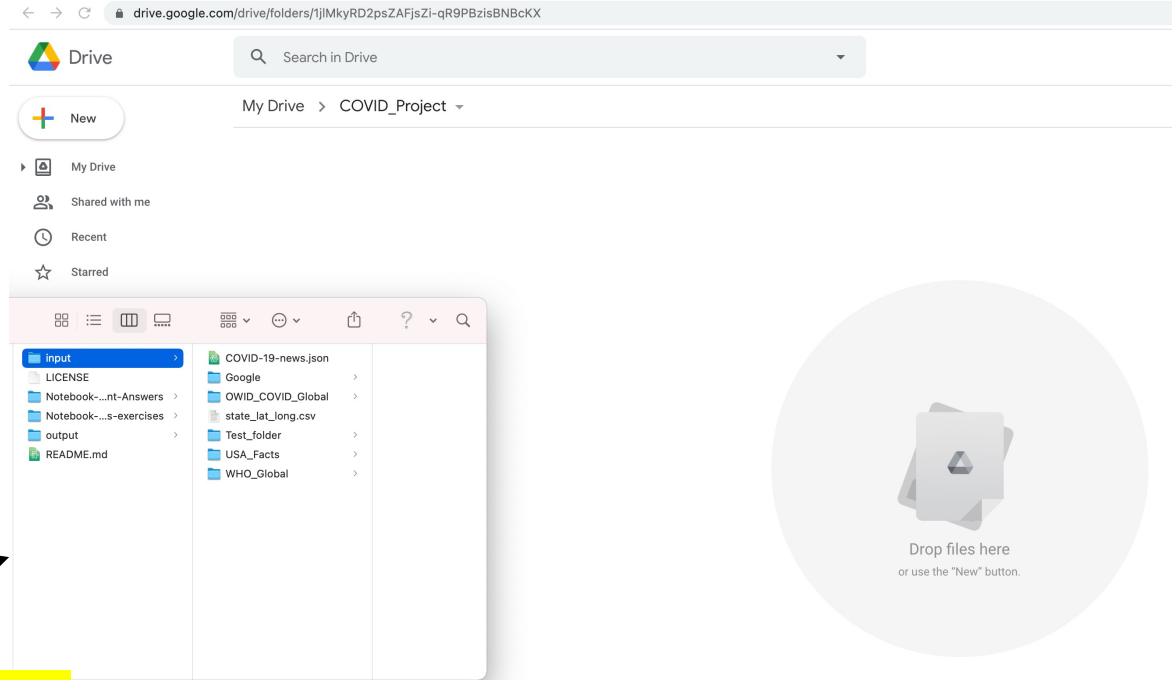
168.2 MB of 15 GB used

Buy storage





Google Drive for Data Files



Local folder with COVID_Project




Google Drive for Data Files

The image shows a screenshot of the Google Drive interface. On the left is a navigation sidebar with options: 'New', 'My Drive', 'Shared with me', 'Recent', 'Starred', 'Trash', and 'Storage'. The main area shows the path 'My Drive > COVID_Project'. Under 'Folders', there are two folders: 'input' and 'output'. A yellow box at the bottom right contains the text 'Sandbox files'. Two black arrows originate from this box and point to the 'input' and 'output' folders, indicating that these folders are used for sandbox files.

More Resources

Working with Notebooks in Colab

- [Overview of Colaboratory](#)
- [Guide to Markdown](#)
- [Importing libraries and installing dependencies](#)
- [Saving and loading notebooks in GitHub](#)
- [Interactive forms](#)
- [Interactive widgets](#)
-  [TensorFlow 2 in Colab](#)

Working with Data

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- [Charts: visualizing data](#)
- [Getting started with BigQuery](#)

Select sample notebook



Loading Data from Google Drive

```
from google.colab import drive
drive.mount('/content/drive')
```

... Go to this URL in a browser: [https:](https://)

Enter your authorization code:

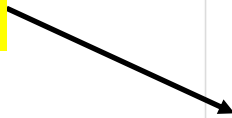
Run the cell

Click authorization hyperlink




Loading Data from Google Drive

Choose account





Sign in with Google



Choose an account


to continue to [Google Drive for desktop](#)

 Arvind Sathi
arvind@sathi.us


 Use another account

To continue, Google will share your name, email address, language preference, and profile picture with Google Drive for desktop. Before using this app, you can review Google Drive for desktop's [privacy policy](#) and [terms of service](#).











Loading Data from Google Drive



Google Drive for desktop wants to access your Google Account

 arvind@sathi.us


This will allow **Google Drive for desktop** to:

-  See, edit, create, and delete all of your Google Drive files 
-  View the photos, videos and albums in your Google Photos 
-  Retrieve Mobile client configuration and experimentation 
-  View Google people information such as profiles and contacts 
-  Access your 

Make sure you trust Google Drive for desktop

You may be sharing sensitive info with this site or app. Learn about how Google Drive for desktop will handle your data by reviewing its [terms of service](#) and [privacy policies](#). You can always see or remove access in your [Google Account](#).

[Learn about the risks](#)

Cancel 

Click "Allow"

Loading Data from Google Drive

Google

Sign in

Please copy this code, switch to your application and paste it there:

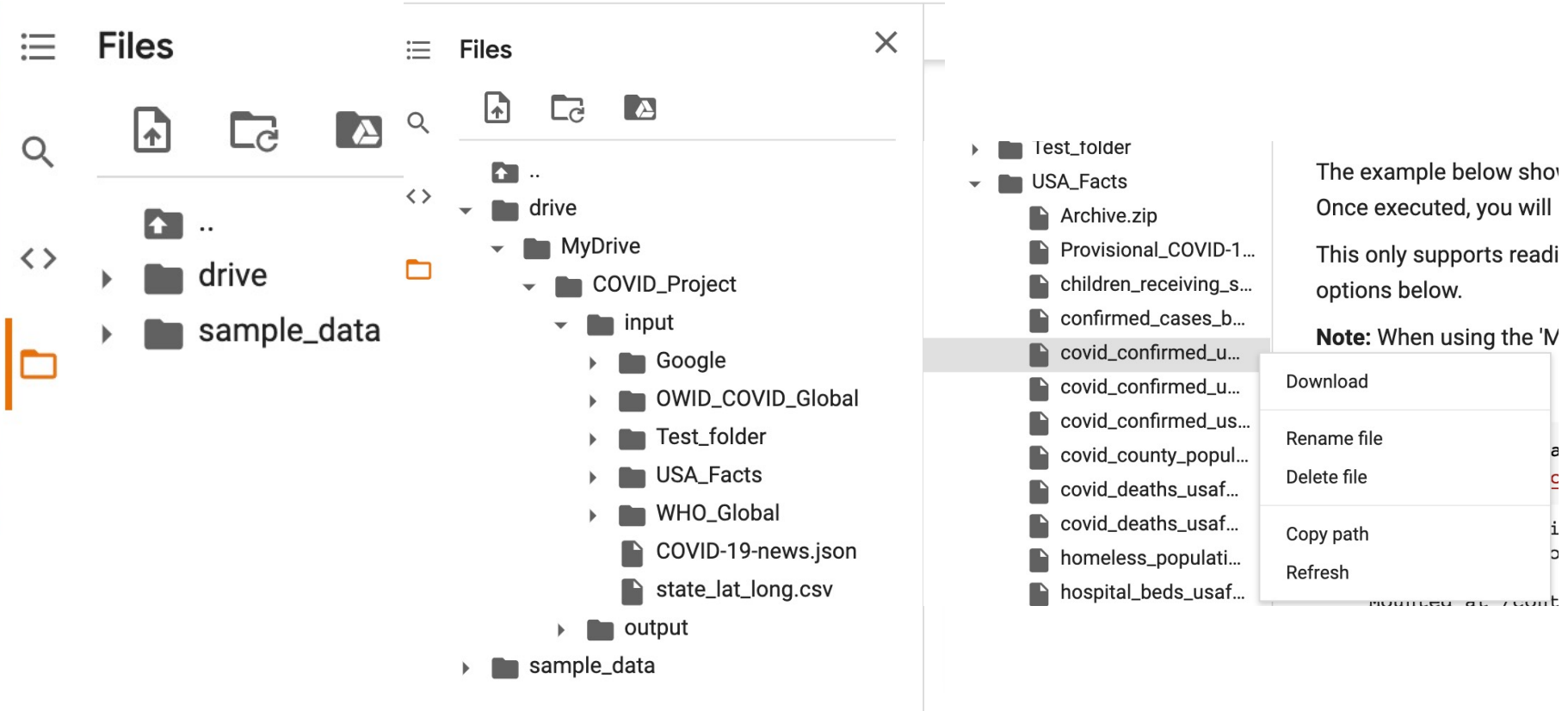
```
4/1AY0e-g5YxqmUguh04vHMhtUCj01WuRWhDbT-  
MBERtB7j8cdgQsjTQotejZk
```



```
from google.colab import drive  
drive.mount('/content/drive')
```

Mounted at /content/drive

Google Colab Access to Drive

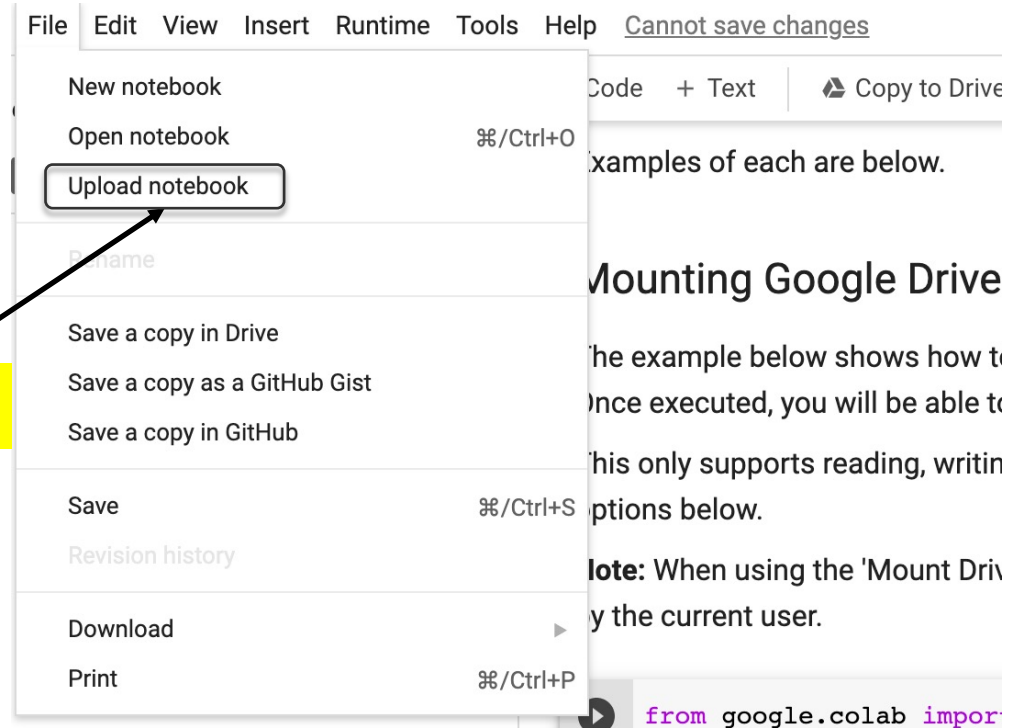


The image shows two side-by-side file explorer windows. The left window shows the root of the file system with folders for 'drive' and 'sample_data'. The right window shows a nested view of the 'drive' folder, containing 'MyDrive' and 'sample_data'. Inside 'MyDrive', there is a 'COVID_Project' folder with sub-folders 'input' and 'output'. The 'input' folder contains 'Google', 'OWID_COVID_Global', 'Test_folder', 'USA_Facts', and 'WHO_Global'. The 'output' folder contains 'COVID-19-news.json' and 'state_lat_long.csv'. A context menu is open over a file named 'covid_confirmed_u...' in the 'input' folder, showing options: Download, Rename file, Delete file, Copy path, and Refresh.

Note: When using the 'M' (Mount) option, the example below shows that once executed, you will only have read access. This only supports read options below.



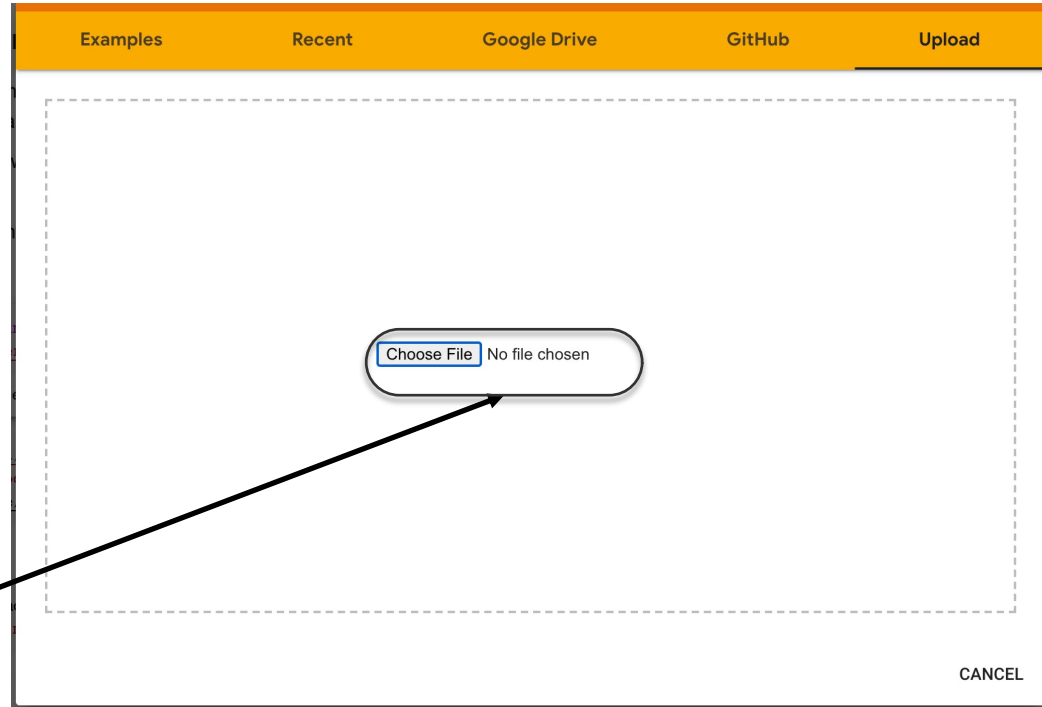
Upload Notebook



Click "Upload notebook"



Upload Notebook



Click "Choose file"



Upload Notebook

Name	Size	Kind	Date Modified
Hello_world.ipynb	2 KB	Atom Document	Yesterday at 3:45 PM
Step-2-Prepare-Data-Task-6-Engineer-Features.ipynb	209 KB	Atom Document	Apr 2, 2021 at 12:43 AM
Step-3-Prepare-Data-Task-5-Sort.ipynb	169 KB	Atom Document	Apr 2, 2021 at 12:37 AM
Step-3-Prepare-Data-Task-4-Transform.ipynb	147 KB	Atom Document	Apr 2, 2021 at 12:34 AM
Step-3-Prepare-Data-Task-4-County.ipynb	107 KB	Atom Document	Apr 2, 2021 at 12:31 AM
Step-3-Prepare-Data-Task-3-Reformat-operation.ipynb	81 KB	Atom Document	Apr 2, 2021 at 12:19 AM
Step-3-Prepare-Data-Task-1-2-Select-and-Filter-operation.ipynb	72 KB	Atom Document	Apr 2, 2021 at 12:15 AM
Step-2-Describe-Data.ipynb	117 KB	Atom Document	Apr 2, 2021 at 12:13 AM
Step-3-Prepare-Data-Task-0.ipynb	4 KB	Atom Document	Apr 1, 2021 at 11:52 PM
Step-6-Deploy-Model-Task-2-Scoring-Engine.ipynb	12 KB	Atom Document	Mar 20, 2021 at 5:22 PM
Step-6-Deploy-Model-Task-1-Scoring-Engine.ipynb	37 KB	Atom Document	Mar 20, 2021 at 4:54 PM
Step-5-Task-3-Evaluate-Forecasting.ipynb	265 KB	Atom Document	Mar 20, 2021 at 4:37 PM
Step-4-Develop-Model-Task-4-Classification.ipynb	331 KB	Atom Document	Mar 16, 2021 at 6:38 PM
Step-5-Evaluate-Model-Task-2-Classification.ipynb	174 KB	Atom Document	Mar 16, 2021 at 4:40 PM
Step-5-Evaluate-Model-Task-1-Regression.ipynb	244 KB	Atom Document	Mar 16, 2021 at 4:04 PM

Click "Hello_world.ipynb"



Start Anaconda

The screenshot shows a Jupyter Notebook interface with the following elements:

- File name: Hello_world.ipynb
- Menu: File Edit View Insert Runtime Tools Help
- Code cells:
 - [1] `import os` (Annotated: Import libraries)
 - [2] `your_name = "Arvind Sathi"` (Annotated: Assign variable)
 - [3] `print("Hello ", your_name)` (Annotated: Print variable)
Output: Hello Arvind Sathi
 - [4] `current_dir = os.getcwd()` (Annotated: Find current directory)
- Variable inspection:
 - Variable: `current_dir`
 - Value: `'/content'`



Google Colab Setup Summary

1. Access Google Colaboratory
2. Google Drive for data files
3. Upload Sandbox files to Google Drive
4. "Hello World" notebook

colab.research.google.com/notebooks/intro.ipynb?utm_source=scs-index

Apps + Flip it Google Cloud SD... You are now auth... Course Login | Onl... Azure Index of /subscrip... UCI Resources Neena'sPersonal Research MIT Sloan School...

Welcome To Colaboratory

File Edit View Insert Runtime Tools Help

Table of contents

- Getting started
- Data science
- Machine learning
- More Resources
- Machine Learning Examples
- Section

+ Code + Text Copy to Drive

What is Colaboratory?

Colaboratory, or "Colab" for short, allows you to write and execute Python in your browser, with

- Zero configuration required
- Free access to GPUs
- Easy sharing

Whether you're a **student**, a **data scientist** or an **AI researcher**, Colab can make your work easier. Watch [Introduction to Colab](#) to learn more, or just get started below!

Getting started

The document you are reading is not a static web page, but an interactive environment called a **Colab notebook** that lets you write and execute code.

For example, here is a **code cell** with a short Python script that computes a value, stores it in a variable, and prints the result:

```
[ ] seconds_in_a_day = 24 * 60 * 60
seconds_in_a_day

86400
```

To execute the code in the above cell, select it with a click and then either press the play button to the left of the code, or use the keyboard shortcut "Command/Ctrl+Enter". To edit the code, just click the cell and start editing.

Variables that you define in one cell can later be used in other cells: