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. Wat 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** 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 variab the result:

```
import pandas as pd
import numpy as np
print("Hello Capstone Project Course!")
```

    Hello Capstone Project Course!

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

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

```
seconds_in_a_week = 7 * seconds_in_a_day
seconds_in_a_week
```

    604800

Colab notebooks allow you to combine **executable code** and **rich text** in a single document, along wit **HTML**, **LaTeX** and more. When you create your own Colab notebooks, they are stored in your Google You can easily share your Colab notebooks with co-workers or friends, allowing them to comment on notebooks or even edit them. To learn more, see Overview of Colab. To create a new Colab notebook the File menu above, or use the following link: create a new Colab notebook.

Colab notebooks are Jupyter notebooks that are hosted by Colab. To learn more about the Jupyter pr jupyter.org.

▾ Data science

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

```python
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()
```

You can import your own data into Colab notebooks from your Google Drive account, including from
as well as from Github and many other sources. To learn more about importing data, and how Colab
for data science, see the links below under [Working with Data](#).

▾ Machine learning

With Colab you can import an image dataset, train an image classifier on it, and evaluate the model, a
[lines of code](#). Colab notebooks execute code on Google's cloud servers, meaning you can leverage th
Google hardware, including [GPUs and TPUs,](#) regardless of the power of your machine. All you need is

Colab is used extensively in the machine learning community with applications including:

- Getting started with TensorFlow
- Developing and training neural networks
- Experimenting with TPUs
- Disseminating AI research
- Creating tutorials

To see sample Colab notebooks that demonstrate machine learning applications, see the [machine le examples](#) below.

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](#)
- NEW [TensorFlow 2 in Colab](#)

Working with Data

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

Machine Learning Crash Course

These are a few of the notebooks from Google's online Machine Learning course. See the [full course](#) more.

- [Intro to Pandas](#)
- [Tensorflow concepts](#)
- [First steps with TensorFlow](#)
- [Intro to neural nets](#)
- [Intro to sparse data and embeddings](#)

Using Accelerated Hardware

- [TensorFlow with GPUs](#)
- [TensorFlow with TPUs](#)

Machine Learning Examples

To see end-to-end examples of the interactive machine learning analyses that Colaboratory makes possible, check out the [AI Hub](#) project.

A few featured examples:

- [Neural Style Transfer](#): Use deep learning to transfer style between images.
- [EZ NSynth](#): Synthesize audio with WaveNet auto-encoders.
- [Fashion MNIST with Keras and TPUs](#): Classify fashion-related images with deep learning.
- [DeepDream](#): Produce DeepDream images from your own photos.
- [Convolutional VAE](#): Create a generative model of handwritten digits.