Start Lab 03:00:00

Machine Learning for Finance Freestyle

3 hours Free ★★★★☆

Overview

In this specialization you've learned a number of machine learning algorithms and tools. This labs gives you the opportunity to apply what you have learned to SP500 daily data. There's no prescription. We give you the data and encourage you to be creative.

Objectives

In this lab, you will:

- Pull daily SP500 data using BigQuery
- Train a machine learning model to predict directional movement of stocks
- Compare your model to several benchmarks, including AutoML Tables

Once you're ready, scroll down and follow the steps below to get your lab environment set up.

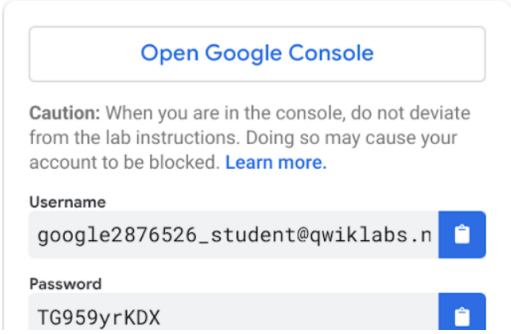
Set up your environment

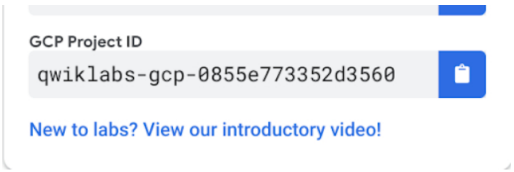
For each lab, you get a new Google Cloud project and set of resources for a fixed time at no cost.

1. Make sure you signed into Qwiklabs using an **incognito window**.
2. Note the lab's access time (for example, 02:00:00 and make sure you can finish in that time block.

   There is no pause feature. You can restart if needed, but you have to start at the beginning.

3. When ready, click START LAB.
4. Note your lab credentials. You will use them to sign in to the Google Cloud Console.





5. Click **Open Google Console**.

6. Click **Use another account** and copy/paste credentials for **this** lab into the prompts.

> If you use other credentials, you'll get errors or **incur charges**.

7. Accept the terms and skip the recovery resource page.

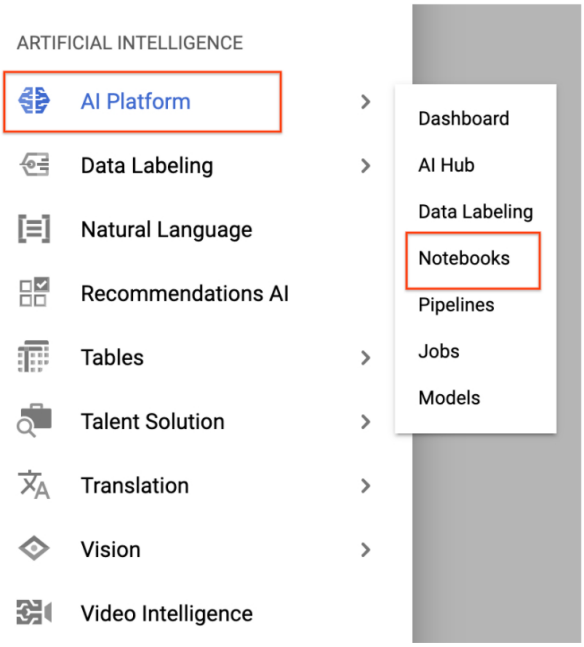
> Do not click **End Lab** unless you are finished with the lab or want to restart it. This clears your work and removes the project.

Launch AI Platform Notebooks

To launch AI Platform Notebooks:

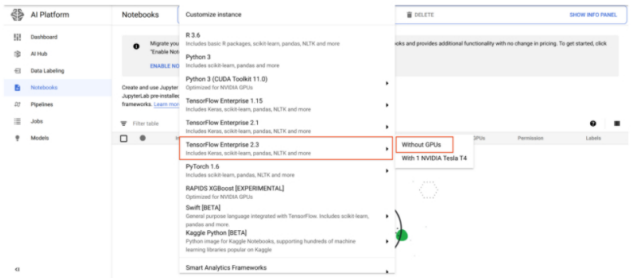
Step 1

Click on the **Navigation Menu**. Navigate to **AI Platform**, then to **Notebooks**.

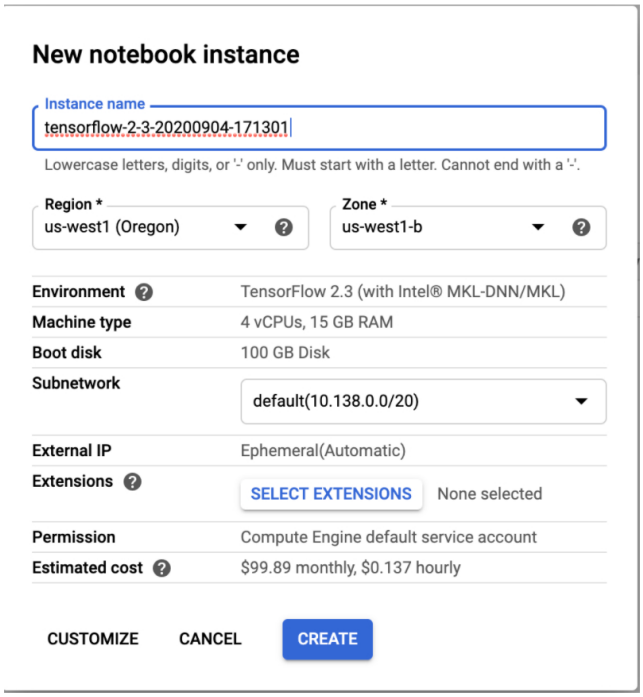


Step 2

On the Notebook instances page, click + NEW INSTANCE . Select the latest version of TensorFlow Enterprise `2.x` *Without GPUs*.



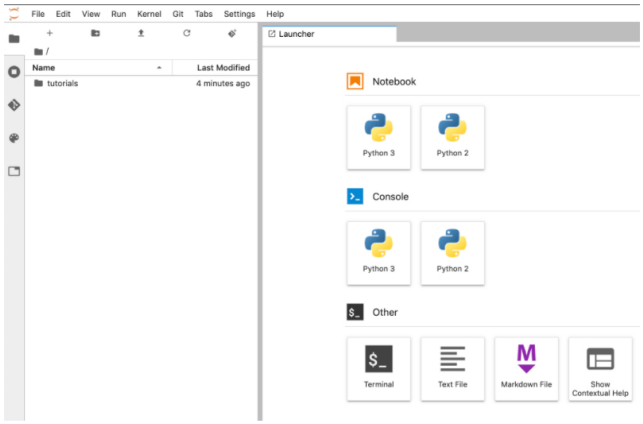
In the pop-up, confirm the name of the deep learning VM, move to the bottom of the window and click **Create**.



The new VM will take 2-3 minutes to start.

Step 3

Click **Open JupyterLab**. A JupyterLab window will open in a new tab.

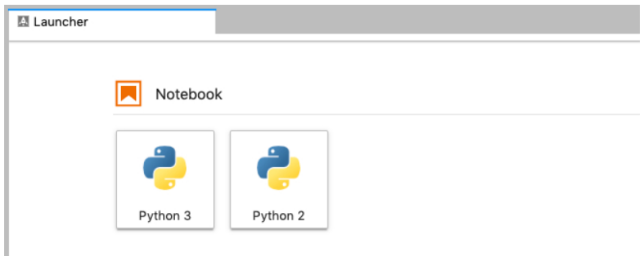


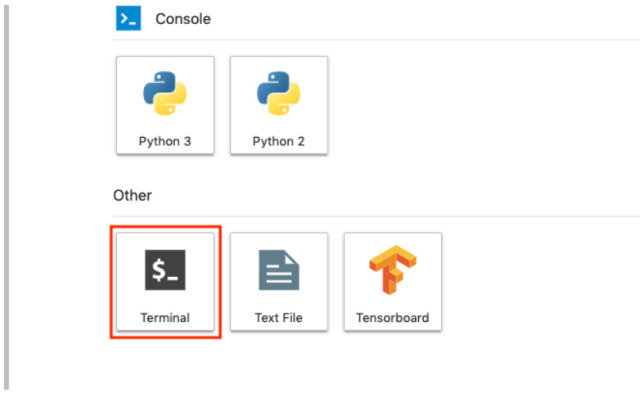
Clone Code

To clone the relevant notebook into your JupyterLab instance:

Step 1

In JupyterLab, click the Terminal icon to open a new terminal.





Step 2

At the command-line prompt, type in the following command and press Enter.

```
git clone https://github.com/GoogleCloudPlatform/training-data-analyst.git
```

Step 3

Confirm that you have cloned the repository by double clicking on the `training-data-analyst` directory and ensuring you can see its contents.

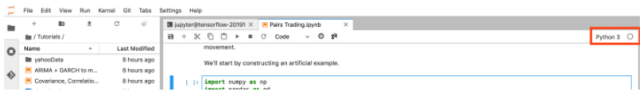
Run Through the Notebook

Step 1

From the left-hand menu, select **training-data-analyst > courses > ai-for-finance > practice > freestyle.ipynb**. This will open a new tab.

Step 2

Ensure you're using the Python 3 kernel by selecting `Python 3` from the upper right corner of the notebook.

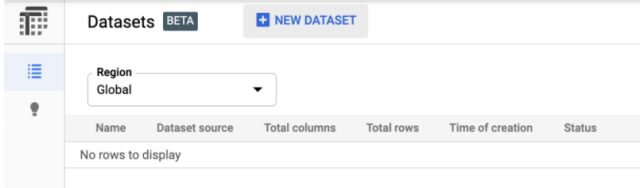


Step 3

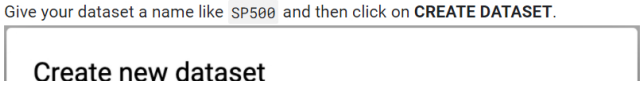
Read through the notebook's contents and run all code blocks with **Shift + Enter**. Return here after you have completed the instructions in the notebook. You can try building a model using AutoML Tables to serve as a benchmark. AutoML will take only a few minutes to get going and around an hour to train. While training, you can work on developing your own model.

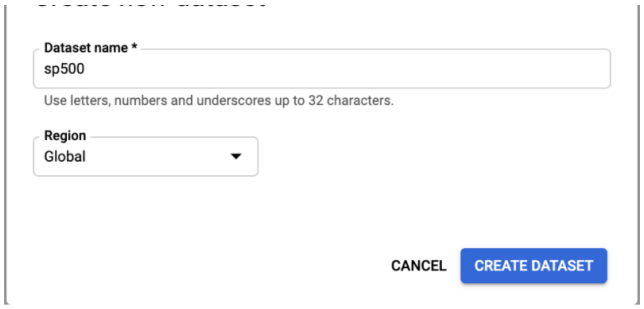
Build a Model Using AutoML Tables

1. In the GCP console, select **Tables > Datasets** under the **ARTIFICIAL INTELLIGENCE** section. Click **Enable API** to turn on the Cloud AutoML API if it is not already enabled.
2. Click **NEW DATASET**.



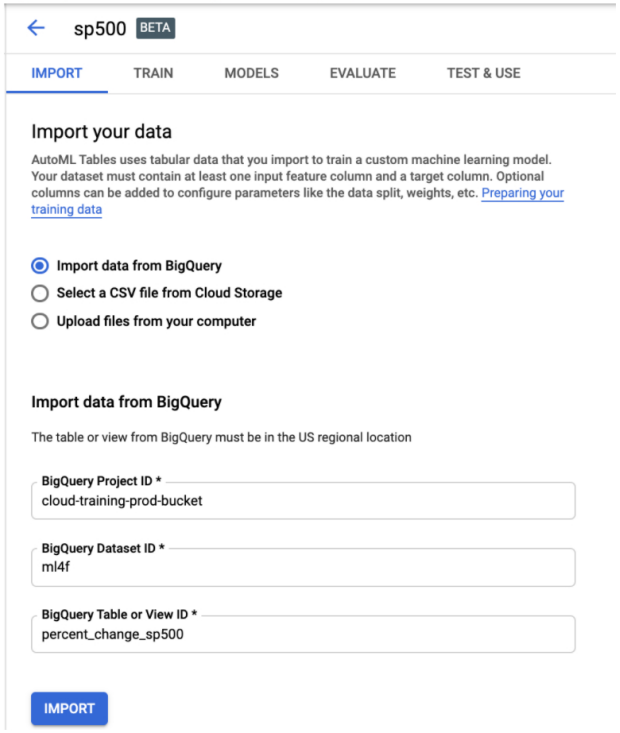
3. Give your dataset a name like `SP500` and then click on **CREATE DATASET**.



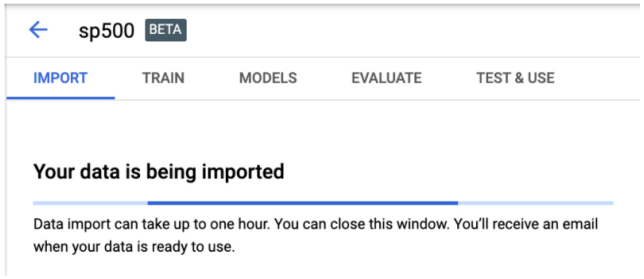


4. In the interface select the following options:

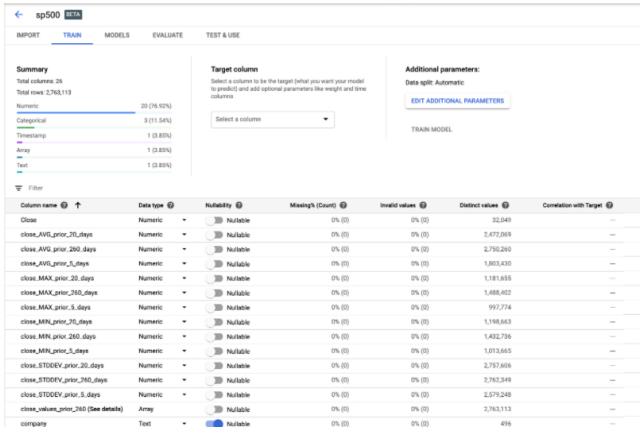
- Import data from BigQuery
- BigQuery Project ID = cloud-training-prod-bucket
- BigQuery Dataset ID = ml4f
- BigQuery Table or View ID = percent_change_sp500

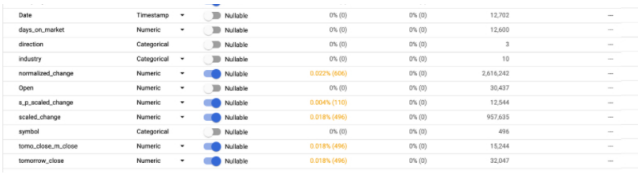


5. Click on **Import**. You may have to wait around 10 minutes.



6. After the data is imported, the **TRAIN** tab should display this:





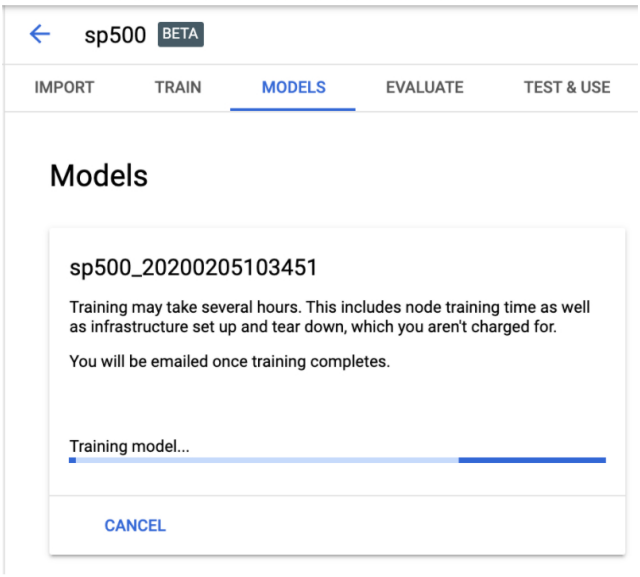
Select **direction** for **Target column**.

7. Click on **TRAIN MODEL**.

8. Input 1 node hour for the training budget. For **Input feature selection** click on only the following features:

   - symbol
   - close_MIN_prior_5_days
   - close_MIN_prior_20_days
   - close_MIN_prior_260_days
   - close_MAX_prior_5_days
   - close_MAX_prior_20_days
   - close_MAX_prior_260_days
   - close_AVG_prior_5_days
   - close_AVG_prior_20_days
   - close_AVG_prior_260_days
   - close_STDDEV_prior_5_days
   - close_STDDEV_prior_20_days
   - close_STDDEV_prior_260_days

9. Click **TRAIN MODEL**. The model will take around an hour to train.



10. Inspect the evaluation metrics generated by AutoML Tables. Is this model any good? Can you build a better model?

End your lab

When you have completed your lab, click **End Lab**. Qwiklabs removes the resources you've used and cleans the account for you.

You will be given an opportunity to rate the lab experience. Select the applicable number of stars, type a comment, and then click **Submit**.

The number of stars indicates the following:

- 1 star = Very dissatisfied
- 2 stars = Dissatisfied
- 3 stars = Neutral
- 4 stars = Satisfied
- 5 stars = Very satisfied

You can close the dialog box if you don't want to provide feedback.

For feedback, suggestions, or corrections, please use the **Support** tab.