Start Lab   02:30:00

Estimate parameters using Kalman Filters

2 hours 30 minutes   Free   ★★★★☆

Overview

Kalman filter is an algorithm that uses noisy observations of a system over time to estimate the parameters of the system (some of which are unobservable) and predict future observations. At each time step, it makes a prediction, takes in a measurement, and updates itself based on how the prediction and measurement compare.

Objectives

In this lab, you will:

- Estimate Moving Average

- Use Kalman Filters to calculate mean and covariance of our time series

- Modify a Pairs trading function to make use of Kalman Filters

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.

Open Google Console

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked. **Learn more.**

Username

google2876526_student@qwiklabs.n   📋

Password

TG959yrKDX   📋

GCP Project ID

qwiklabs-gcp-0855e773352d3560

New to labs? View our introductory video!

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**.

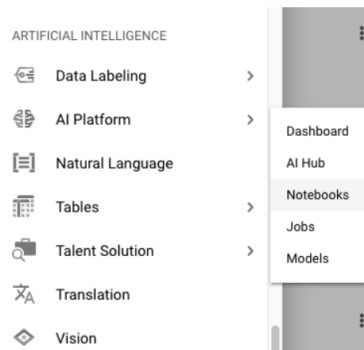7. Accept the terms and skip the recovery resource page.

> 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.

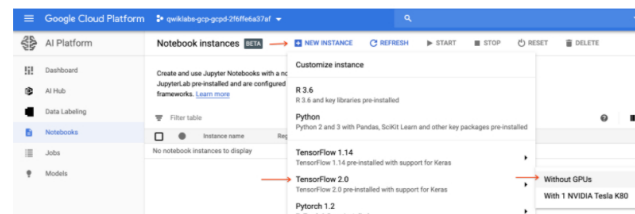## Launch AI Platform Notebooks

To launch AI Platform Notebooks:

Step 1

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

Step 2

On the Notebook instances page, click + NEW INSTANCE . Select TensorFlow 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.

New notebook instance

Instance name *

tensorflow-20191031-100408

Environment:

Image: TensorFlow 2.0 (with Intel® MKL-DNN/MKL and CUDA 10.0)
Packages: python2, python3, scikit-learn, pandas, and nltk.

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

Step 3

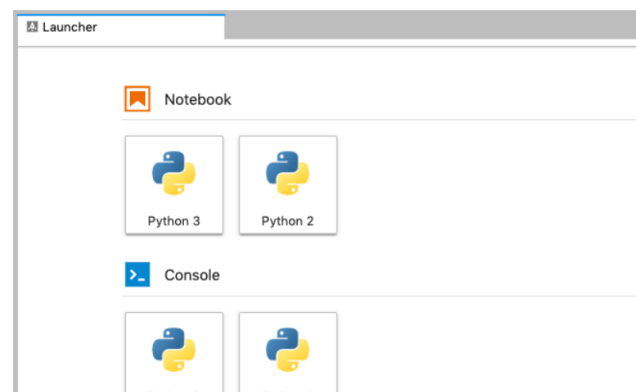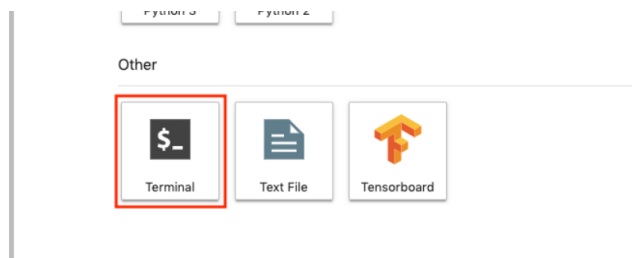Click **Open JupyterLab**. A JupyterLab window will open in a new tab.
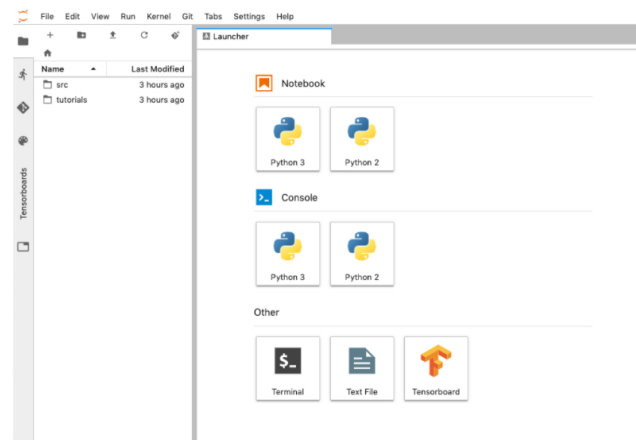
Clone course repository

To clone the `training-data-analyst` notebook in 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
```

Step 3

Confirm that you have cloned the repository by double clicking on the `training-data-analyst` directory and ensuring that you can see its contents. The files for all the Jupyter notebook-based labs throughout this course are available in this directory.
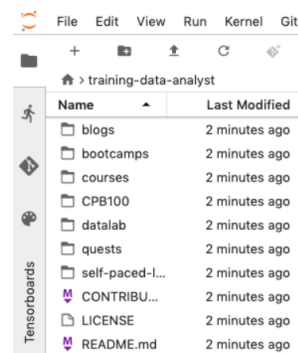
Estimate parameters using Kalman Filters

Step 1

In the notebook interface, navigate to **training-data-analyst > courses > ai-for-finance > practice** and open **kalman_filters.ipynb**.

You can also visit the solution version of the lab in case you need to get unblocked at any stage of the exercise. The solution notebook is available at **training-data-analyst > courses > ai-for-finance > solution** and open **kalman_filters_solution.ipynb**.

Step 2

In the notebook interface, click on **Edit > Clear All Outputs** (click on Edit, then in the drop-down menu, select Clear All Outputs).

Tip: To run the current cell you can click the cell and hit **shift+enter**. Other cell commands are found in the notebook UI under **Run**.

Step 3

Ensure you're using the Python 3 kernel by selecting `Python 3` from the upper right corner of the notebook.
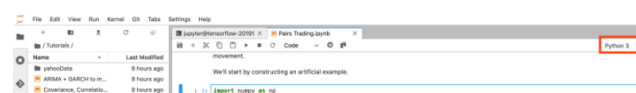
Read the narrative and execute each cell in turn.

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.