#### 02:30:00 Start Lab

#### 2 hours 30 minutes 1 Credit Rate Lab

Momentum Strategies

#### advantage of stocks' tendencies to continue going either up or down, independent of daily fluctuations. Contrarily, mean-reversion strategies are based on trends reversing direction.

In this lab, you'll apply some of the concepts you have learned behind momentum trading and mean reversion by leveraging the Auquan Toolbox, a Python library that provides tools for developing trading algorithms. When building trading strategies you'll rarely start from scratch. In this lab you'll be given code of a trading strategy

Momentum trading strategies, based on concepts from physics, attempt to take

implementation that loses money. Your job will be to modify the code so that the strategy makes money. Objectives In this lab, you will:

Set up your environment

What you'll need

Take an existing implementation of a momentum trading strategy and modify it

#### Time. Note the lab's Completion time in Qwiklabs. This is an estimate of the time it should take to complete all steps. Plan your schedule so you have time to complete the lab. Once you start the lab, you will not be able to pause and return later (you begin at step 1 every time you start a lab).

so that the strategy makes money.

## • The lab's Access time is how long your lab resources will be available. If you

finish your lab with access time still available, you will be able to explore the

bar at the top of your screen.

To complete this lab, you'll need:

Google Cloud Platform or work on any section of the lab that was marked "if you have time". Once the Access time runs out, your lab will end and all resources will terminate.

Access to a standard internet browser (Chrome browser recommended).

- · You DO NOT need a Google Cloud Platform account or project. An account, project and associated resources are provided to you as part of this lab. . If you already have your own GCP account, make sure you do not use it for this lab.
- If your lab prompts you to log into the console, use only the student account provided to you by the lab. This prevents you from incurring charges for lab activities in your personal GCP account. Start your lab When you are ready, click Start Lab. You can track your lab's progress with the status
- Important What is happening during this time? Your lab is spinning up GCP resources for you behind the scenes, including an account, a project, resources within the project, and permission for you to control the resources needed to run the lab. This means that instead of spending time
- manually setting up a project and building resources from scratch as part of your lab, you can begin learning more quickly. Find Your Lab's GCP Username and Password
- To access the resources and console for this lab, locate the Connection Details panel in Qwiklabs. Here you will find the account ID and password for the account you will use to log in to the Google Cloud Platform:

**Open Google Console** 

Caution: When you are in the console, do not deviate

google2876526\_student@qwiklabs.n 📋

qwiklabs-gcp-0855e773352d3560

New to labs? View our introductory video!

#### from the lab instructions. Doing so may cause your account to be blocked. Learn more. Username

Password

TG959yrKDX

will appear on this panel as well.

click the Open Google Console button.

Choose an account

Signed out

Signed out

Use another account

to continue to Google Cloud Platform

Google

**GCP Project ID** 

Log in to Google Cloud Console Using the Qwiklabs browser tab/window or the separate browser you are using for the Qwiklabs session, copy the Username from the Connection Details panel and

You'll be asked to Choose an account. Click Use another account.

gcpstaging10382\_student@qwiklabs.net

gcpstaging10408\_student@qwiklabs.net

If your lab provides other resource identifiers or connection-related information, it

Paste in the Username, and then the Password as prompted:

Google

Sign in

Enter your email

· Do not sign up for free trials

next to "Google Cloud Platform".

**Data Labeling** 

Al Platform

Tables

Natural Language

**Talent Solution** 

Translation

Vision

NEW INSTANCE

different.

Step 2

lab:

gcpstaging277-student@qwiklabs.net More options NEXT

Note: You can view the list of services by clicking the GCP Navigation menu button at the top-left

API Manager Project info qwiklabs-gcp-064ca0 Cloud Launcher Project ID: qwiklabs-gcp-064 #916654314173 Support IAM & Admin Manage project settings

Google Cloud Platform qwiklabs-gcp-064ca0bf1f... +

#### Customize instance ₽d R 3.6 R 3.6 and key libraries pre-installed

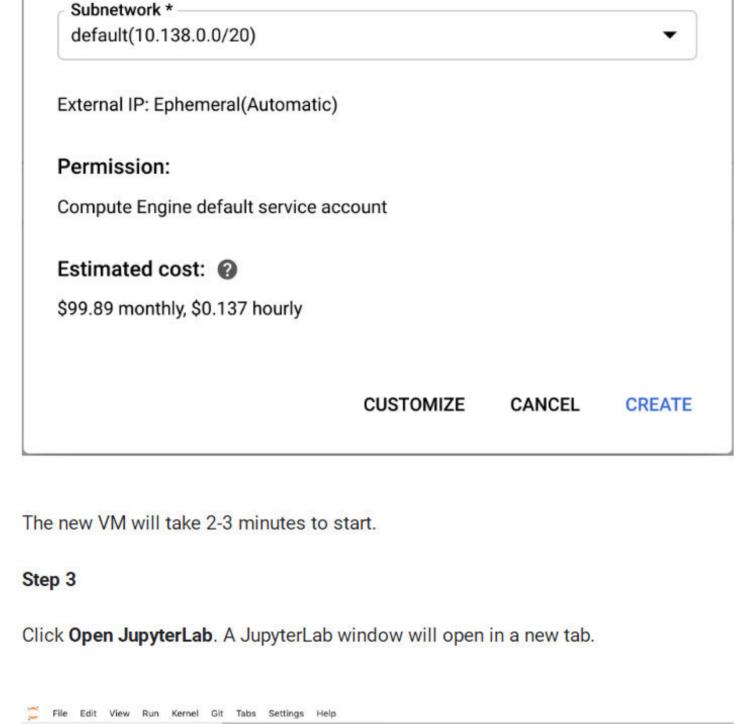
C REFRESH

Tensorflow Enterprise 1.15 > Without GPUs:

With 1 NVIDIA Tesla K80 TensorFlow 2.0 TensorFlow 2.0 pre-installed with support for Keras Pytorch 1.2 PyTorch 1.2 pre-installed

Tensorflow 1.XX versions change semi-frequently, so the version you pick may be

In the pop-up, confirm the name of the deep learning VM and click Create.



Step 1 Navigate to the Tutorials directory and open momentum\_backtest\_losing\_money.ipynb. Step 2

B + X () () → ■ () Code → () pt

the top of the notebook and execute the following code:

Restart Kernel...

Shut Down Kernel

Change Kernel...

Shut Down All Kernels...

9 hours ago

Restart Kernel and Clear All Outputs... Restart Kernel and Run All Cells...

We'll start by constructing an artificial example.

+ 85 ft C @ Majupyter@tensorflow-20191 X Figure Trading.ipynb

8 hours ago

Covariance, Correlatio... 8 hours ago

#### File Edit View Run Kernel Git Tabs Settings Help m / Tutorials / ARIMA + GARCH to m. Covariance, Correlatio

Long-Short Strategies...

corner of the notebook.

K ARIMA + GARCH to m... 8 hours ago

Step 3

**Next Steps / Learn More** · Official documentation on Al Platform Notebooks

· Auquan blogpost on monentum trading

The number of stars indicates the following: 1 star = Very dissatisfied · 2 stars = Dissatisfied

Google Cloud Training & Certification

Overview

End your lab

Overview

Set up your environment

Clone Auquan Tutorials

Next Steps / Learn More

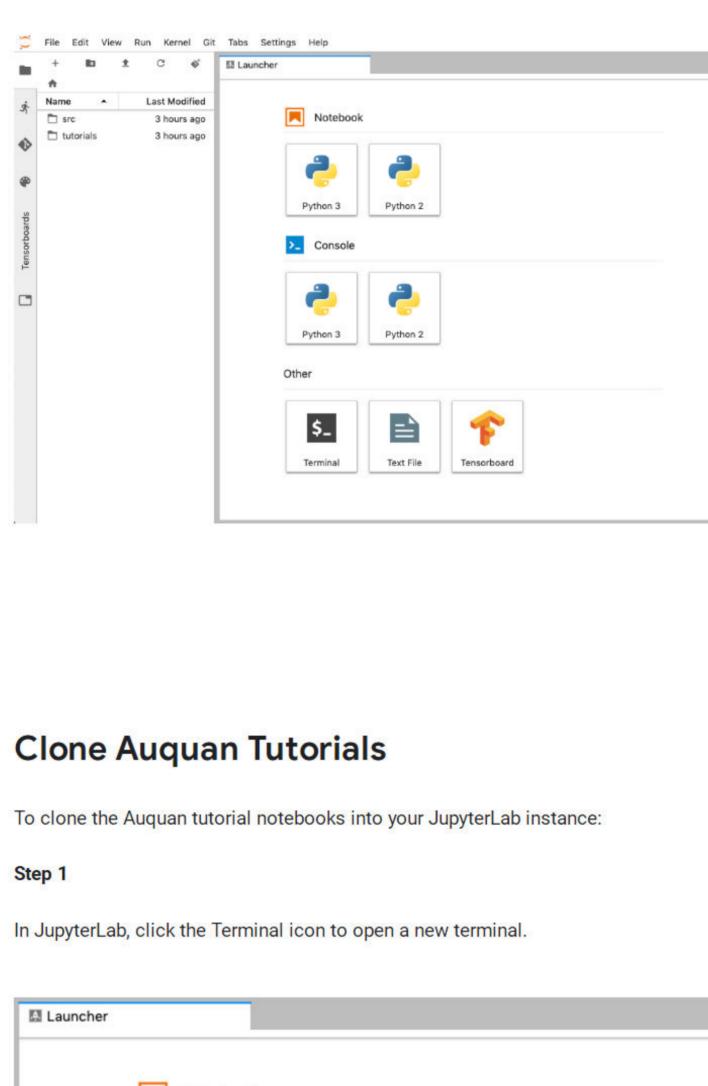
Pairs Trading

Launch Al Platform Notebooks

## TensorFlow Enterprise 1.15 TensorFlow Enterprise 1.15 pre-installed with support for Keras

Python 2 and 3 with Pandas, SciKit Learn and other key packages pre-installed

**Environment:** Image: TensorFlow Enterprise 1.15 Packages: python2, python3, scikit-learn, pandas, and nltk.



# **Pairs Trading**

directory and ensuring that you can see its contents.

## Step 4 In the notebook interface, click on Kernel > Restart Kernel and Clear All Outputs.

%pip install pandas==0.24.1 --user %pip install tensorboardX --user

%pip install -U auquan\_toolbox --user

%pip install bs4 --user

Read the narrative and execute each cell in turn. Any section with TODO should be modified per the instructions. If you get stuck, open the notebook momentum\_backtest\_making\_money.ipynb in the Tutorials directory. This notebook is the solution.

End your lab
When you have completed your lab, click <b>End Lab</b> . 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 <b>Submit</b> .

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

demand, live, and virtual options to suit your busy schedule. Certifications help you validate and prove your skill and expertise in Google Cloud technologies. Manual Last Updated November 20, 2019 Lab Last Tested November 20, 2019 ©2019 Google LLC All rights reserved. Google and the Google logo are trademarks of Google LLC. All other company and product names may be trademarks of the respective companies with which they are associated.

 3 stars = Neutral · 4 stars = Satisfied

...helps you make the most of Google Cloud technologies. Our classes include technical skills and best practices to help you get up to speed quickly and continue your learning journey. We offer fundamental to advanced level training, with on-

**Q** 在线交谈

Accept the terms and conditions. Since this is a temporary account, which you will only have to access for this one Do not add recovery options

**Launch Al Platform Notebooks** To launch Al Platform Notebooks: Step 1 Click on the Navigation Menu. Navigate to Al Platform, then to Notebooks. ARTIFICIAL INTELLIGENCE

>

Dashboard

Notebooks

Al Hub

Jobs

Models

On the Notebook instances page, click + NEW INSTANCE . Select a 1.XX version of

TensorFlow (not a 2.0) without GPUs. In the following example, you would select

► START ■ STOP

C) RESET

DELETE

Without GPUs

Ш

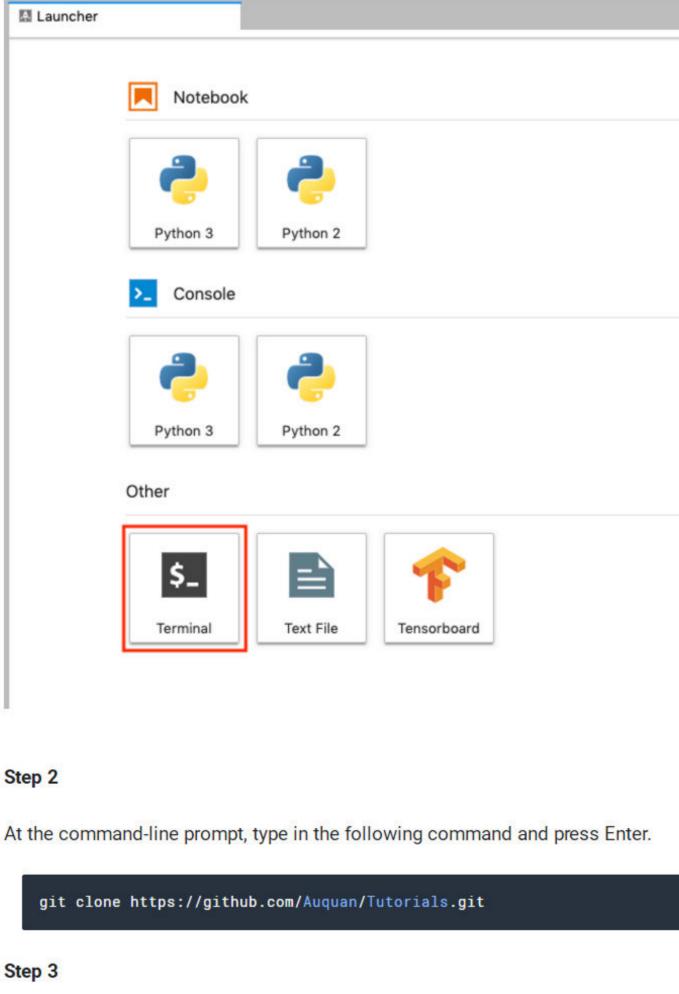
New notebook instance Instance name \* tensorflow-20191107-145738

Machine type: 4 vCPUs, 15 GB RAM

Region and zone: us-west1-b

Boot disk: 100 GB Disk

Networking:



Confirm that you have cloned the repository by double clicking on the Tutorials

Ensure you're using the Python 3 kernel by selecting Python 3 from the upper right

You'll need to install some libraries to complete the notebook. Create a new cell at

I, I X Pairs Trading.ipynb

■ C Code ∨ ⊙ git

ading Strategy

companies that manufacture the same product, for example Pe

these two to remain constant with time. However, from time to t

s a nice example of a strategy based on mathema

s as follows: Let's say you have a pair of securitie

### download.png Expected Value and S. Integration, Cointegra...

Step 5

• 5 stars = Very satisfied You can close the dialog box if you don't want to provide feedback.