

Stock Market Analysis and Prediction

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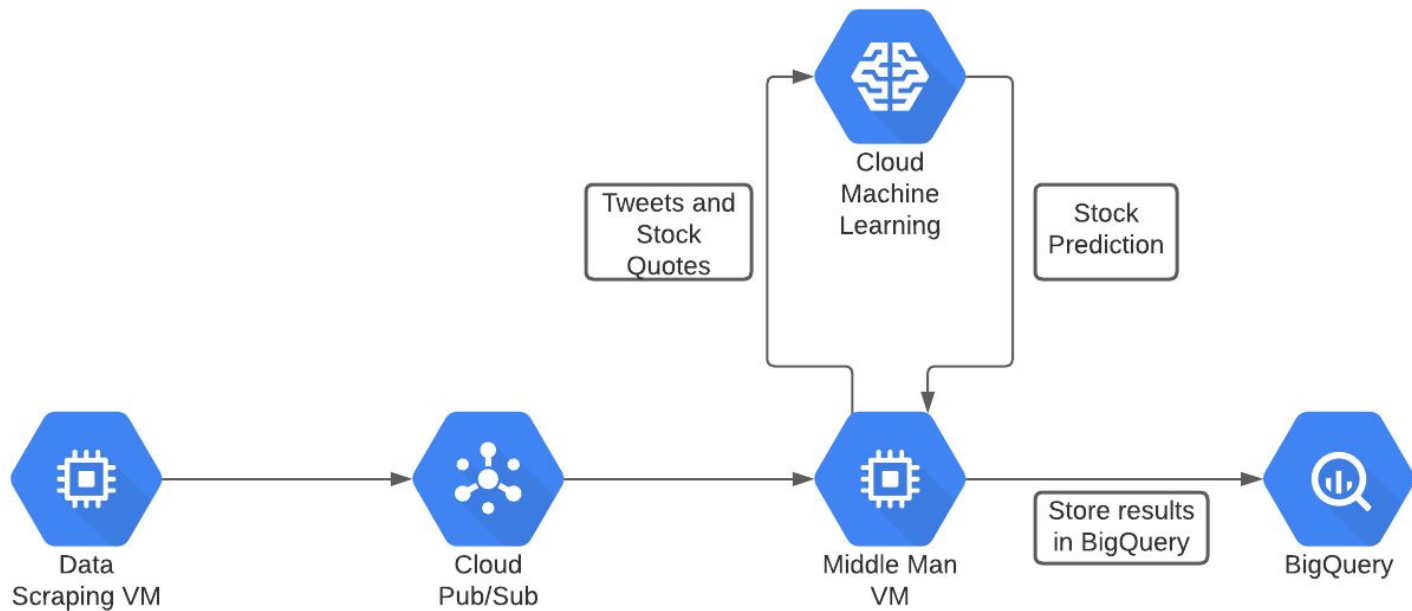
Overview

- Accomplishments
- Architecture
- Data
- Model
- Accuracy
- Evaluation and Performance
- Challenges and changes
- Live Demo
- Demo

Accomplishments

- Data Ingestion for Stock quotes & Polarity for Twitter Sentiment Analysis.
- Set VM Machines on GCP.
- Set Cloud PubSub.
- Train Deep Learning Model (LSTM) for Stock Quotes and Twitter.
- Deploy DL model on GCP.
- Send results to BigQuery.

Architecture



Data – Twitter API and Stock Quotes

The image displays a web application interface with two main panels. The left panel, titled 'Developer Portal', contains a sidebar with navigation links: Dashboard, Projects & Apps (selected), Overview, Project 1, BigDataProjectStockPro (selected), Products (NEW), Twitter API v2, Labs, About, Docs, Premium, Dev Environments, and Subscriptions. The main content area of the left panel shows 'App details' for 'BigDataProjectStockPro'. It includes fields for NAME, APP ID (23550806), and DESCRIPTION. The APP ICON is a Twitter bird. The DESCRIPTION states: 'This information will be visible to people who've authorized your App. This app was created to use the Twitter API.' There is an 'Edit' button and an 'Authentication docs' section with 'Authentication methods' and 'v2 endpoints available with OAuth 2.0'. A 'Quick info on App environments' section is also present. The right panel shows a 'Yahoo Finance' page for Apple Inc. (AAPL). It displays the current stock price as \$156.57, down 0.23 (-0.15%) from the previous close. The page includes a line chart showing the stock price over time, with a red line indicating the current price. The chart is labeled 'Price Crosses Moving Average'. The page also features a 'Morningstar Rating' section and a 'People Also Watch' section. The bottom of the image shows a Windows taskbar with various icons and system information.

Developer Portal

Dashboard

Projects & Apps

Overview

Project 1

BigDataProjectStockPro

Products **NEW**

Twitter API v2

Labs

About

Docs

Premium

Dev Environments

Subscriptions

App details

NAME: BigDataProjectStockPro

APP ID: 23550806

DESCRIPTION: This information will be visible to people who've authorized your App. This app was created to use the Twitter API.

APP ICON: [Twitter Bird]

Authentication docs

Authentication methods

v2 endpoints available with OAuth 2.0

Quick info on App environments

Yahoo Finance

Search for news, symbols or companies

Sign In

Mail

Finance Home Watchlists My Portfolio Cryptocurrencies Yahoo Finance Plus Screeners Markets News Personal Finance

Apple Inc. (AAPL)

NasdaqGS - NasdaqGS Real Time Price. Currency in USD

156.57 -0.23 (-0.15%) **158.64** +2.07 (+1.32%)

After hours 7:32PM EDT

AC Close: 04:00PM EDT

Summary Company Outlook Chart Conversations Statistics Historical Data Profile Financials Analysis Options Holders Sustainability

Previous Close: 156.80 Market Cap: 2.55T

Open: 155.91 Beta (5Y Monthly): 1.19

Bid: 158.61 x 1200 PE Ratio (TTM): 26.63

Ask: 158.89 x 900 EPS (TTM): 6.01

Day's Range: 155.38 - 159.79 Earnings Date: Apr 28, 2022

52 Week Range: 122.25 - 182.94 Forward Dividend & Yield: 0.88 (0.54%)

Volume: 87,511,222 Ex-Dividend Date: Feb 04, 2022

Avg. Volume: 89,192,188 1y Target Est: 192.89

Related Research

Overvalued

The Argus Innovation Model

Portfolio innovation may be hard to...

20 hours ago • Argus Research

Chart Events

Price Crosses Moving Average

View all chart patterns

Morningstar Rating

Can my portfolio help build a better world?

People Also Watch

Symbol Last Price Change % Change

23°C Mostly sunny

5:31 PM 4/27/2022

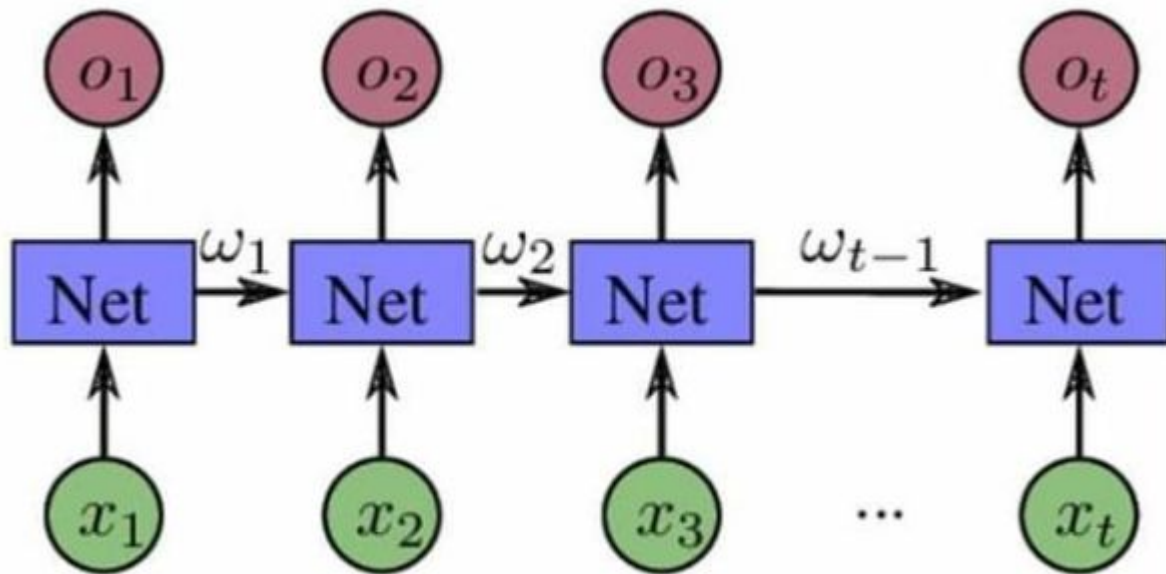
23°C Mostly sunny

5:32 PM 4/27/2022

Training Data

	Open	High	Low	Close	Adj Close	ts_polarity
Date						
2019-08-26	51.465000	51.797501	51.264999	51.622501	50.650135	0.072340
2019-08-27	51.965000	52.137501	50.882500	51.040001	50.078602	0.117541
2019-08-28	51.025002	51.430000	50.830002	51.382500	50.414650	0.061477
2019-08-29	52.125000	52.330002	51.665001	52.252499	51.268261	0.056460
2019-08-30	52.540001	52.612499	51.799999	52.185001	51.202038	0.106096

LSTM (Long Short-Term Memory) networks



Final prediction in BigQuery

① FEATURES & INFO 📄 SHORTCUT 🔌 DISABLE EDITOR TABS

Explorer + ADD DATA ⏮

ⓘ

Viewing pinned projects.

▼

🌐 noble-airport-343004

⋮

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📊 stock_prediction

⋮

📊 apple

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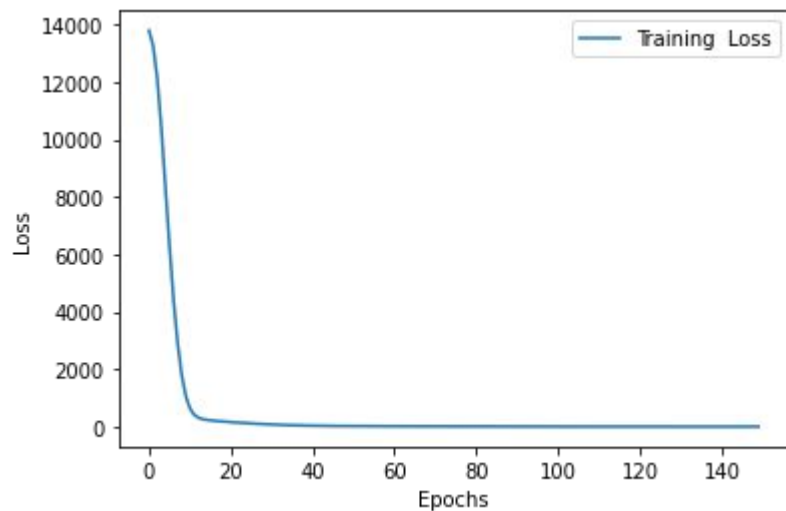
📊 apple 🔍 QUERY 👤 SHARE 📄 COPY 📷 SNAPSHOT 🗑 DELETE 📄 EXPORT

SCHEMA DETAILS PREVIEW

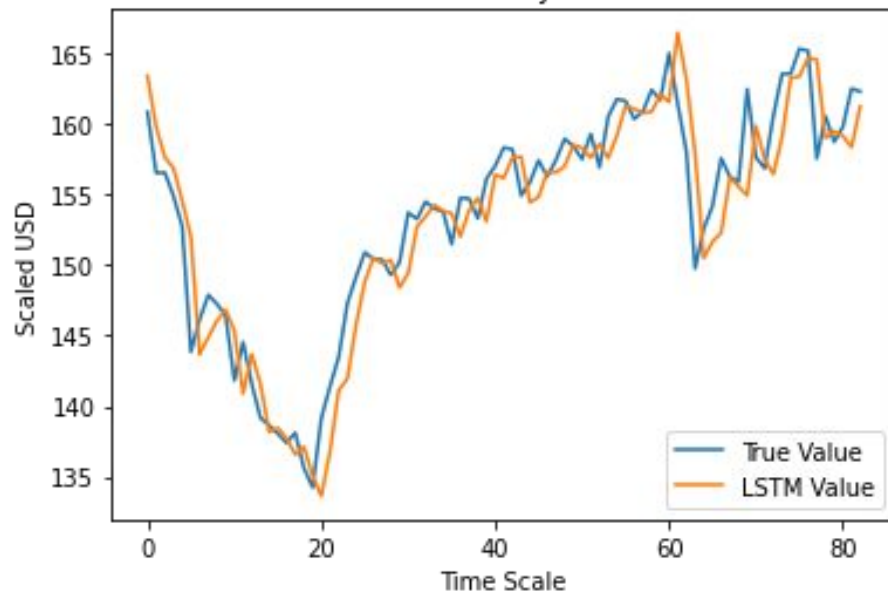
Row	date	price
1	2022-04-23 14:09	159.022491
2	2022-04-23 14:22	159.290741
3	2022-04-23 14:26	158.964874
4	2022-04-23 18:26	159.048325
5	2022-04-23 20:28	159.193146
6	2022-04-24 21:57	159.121689
7	2022-04-25 14:25	158.278381
8	2022-04-25 19:30	159.287933
9	2022-04-26 17:32	153.506439
10	2022-04-26 17:32	153.506439
11	2022-04-26 17:39	153.570358

Accuracy – Stock price prediction

Root Mean Squared Error: 2.89

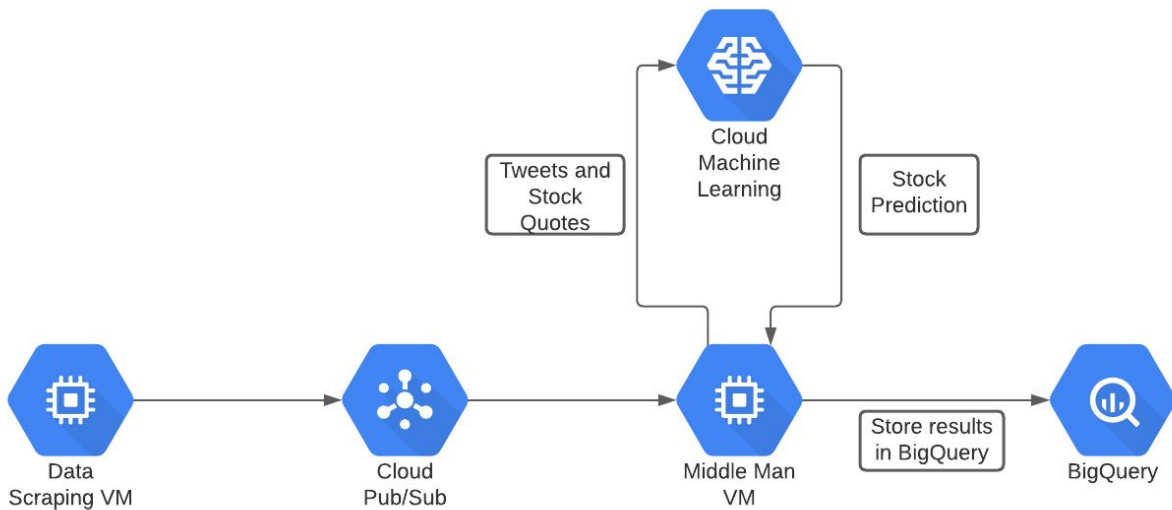


Prediction by LSTM



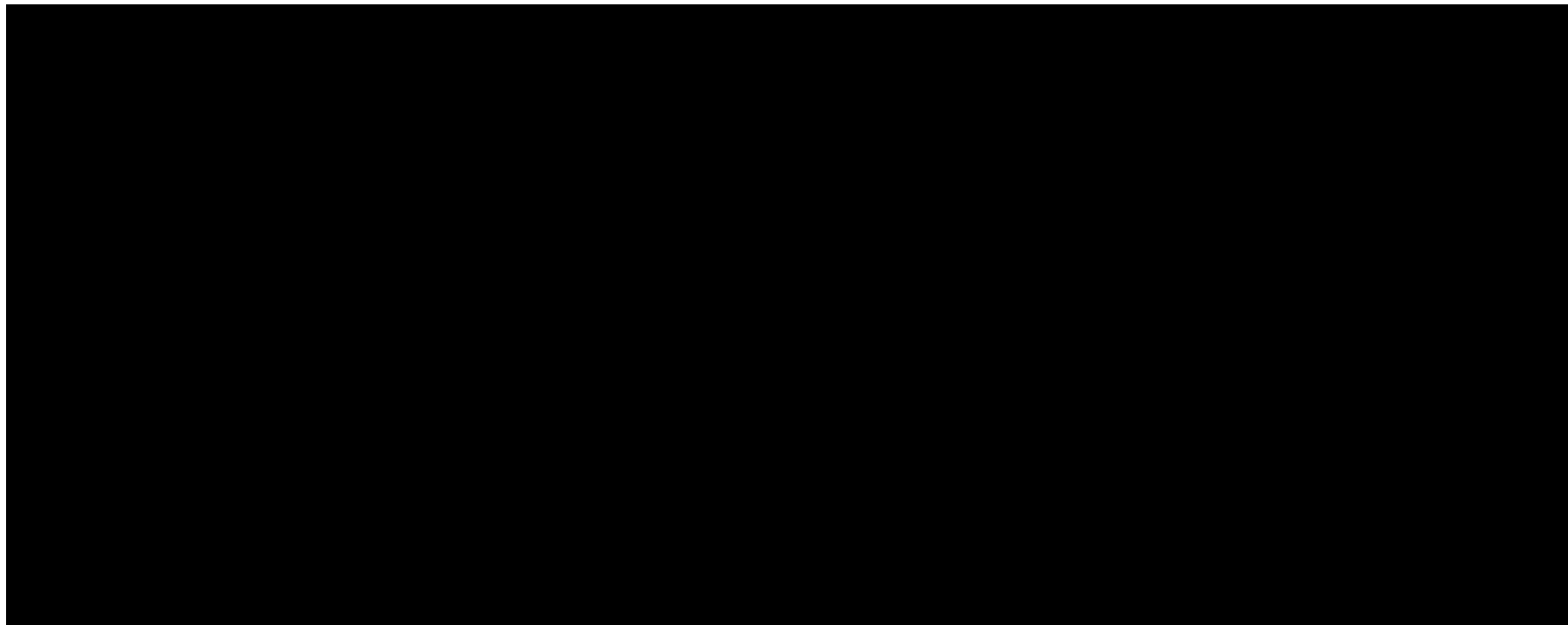
Evaluation

2 seconds from Data Scraping VM to BigQuery table



Live Demo

Demo



Challenges and changes

Challenges:

- Integration of various GCP data tools
- Limitation of Twitter API request pulls.

Changes:

- Replaced dataflow (GCP data processing tool) with the middle-man VM

Thank You!
Questions ?