EE Project Stock projection of Palantir

Why this project?

Trading is extremely challenging and often **unpredictable**, (especially on a day-to-day basis).

Anything that helps predict whether the price will move **up** or **down** the next day is a significant advantage and can be **the difference** between making and losing money.

I have a strong personal interest in the stock market and I'm always curious about how to make **better decisions**.

Palantir is an exciting company, and their business model is essentially **real-life deep learning** → so it felt like a perfect fit for this project.

Ideal Opportunity to **combine content** from UW's business school and the college of engineering.

The basis: What data was used?

Data Sources

1) Closing Price
Nasdaq   Palantir

2) Volume traded
Nasdaq   Palantir

3) Moving Average

Date	Open	High	Low	Close	Adj Close	Volume
9/30/20	10	11.41	9.11	9.5	9.5	338584400
10/1/20	9.69	10.1	9.23	9.46	9.46	124297600
10/2/20	9.06	9.28	8.94	9.2	9.2	55018300
10/5/20	9.43	9.49	8.92	9.03	9.03	36316900
10/6/20	9.04	10.18	8.9	9.9	9.9	90864000
10/7/20	10.04	10.49	9.99	10	10	54672400
10/8/20	10.29	10.4	9.99	10	10	34989200
10/9/20	10.13	10.19	9.89	9.95	9.95	19653500
10/12/20	10.04	10.05	9.66	9.89	9.89	20623600
10/13/20	9.88	9.88	9.41	9.47	9.47	21847200
10/14/20	9.6	9.66	9.29	9.34	9.34	13652600
10/15/20	9.27	9.91	9.18	9.91	9.91	12924100
10/16/20	9.94	9.95	9.66	9.71	9.71	11142500
10/19/20	9.79	9.82	9.53	9.57	9.57	9126400
10/20/20	9.6	9.66	9.27	9.27	9.27	11138200
10/21/20	9.3	9.48	9.2	9.2	9.2	9190000
10/22/20	9.37	9.75	9.22	9.68	9.68	17928600

4) Technical Indicators

- RSI-14: Measures if the stock is overbought or oversold
- MACD: Shows trend strength by comparing fast vs slow moving averages
- MACD Signal: Smoothed MACD used to trigger buy/sell signals
- MACD Histogram: Difference between MACD and Signal; shows momentum.
- Bollinger Band Width: Measures volatility (wide = high volatility).
- ROC-10: Percent change from 10 days ago (momentum)
- ATR-14: Average size of daily price moves (volatility)
- Stochastic-K: Shows where today's price sits between recent high/low (momentum)

yahoo! finance

Model walkthrough

1 Data loading and cleaning

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2 Creating and selecting features

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Scale and Split

⬇

Sequencing

⬇

3 LSTM Architecture

⬇

4 Training

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Evaluate and Predict

1 Creation of futures:
- **Palantir** historical data: Closing price, Volume, 5/10/20-day Moving Averages
- **NASDAQ** historical data: Closing Price, Volume, 1 day and 5 day returns
- **Technical indicators**: RSI-14, MACD, MACD Signal, MACD Histogram, Bollinger Band Width, ROC-10, ATR-14, Stochastic-K

2 Split = All rows but the last 100 (test set) are used for the training

3 Introduction of **2-layer LSTM** model that is fed with 60 days x the defined 5 features. Model learns trends. At every time stamp the model creates a hidden state. The final one is used as representation for the recent market dynamics. Same hidden state is then delivered to 2 states:
- **Regression state**: Output is the next day closing price
- **Classification State**: Using Sigmoid. Output 0 or 1. This is the probability for going up or down.

4 Used **Adam optimizer** and mini-batches for stable convergence

Results: good but not perfect

Prediction vs. Actual

	11/21/25	11/24/25	11/25/25	11/26/25	11/28/25	12/1/25	12/2/25	12/3/25	12/4/25	12/5/25
Prediction	154.85	155.61	161.33	164.24	167.17	168.85	164.81	172.26	178.3	179.37
		0.49%	3.68%	1.80%	1.78%	1.00%	-2.39%	4.52%	3.51%	0.60%
Actual	154.85	162.25	163.55	165.77	168.45	167.49	170.69	176.08	177.92	181.76
		4.78%	0.80%	1.36%	1.62%	-0.57%	1.91%	3.16%	1.04%	2.16%

Direction check   ✓ ✓ ✓ ✓ ✗ ✗ ✓ ✓ ✓

Reasons:

- Palantir is an incredible volatile stock
- Data input not sufficient (more parameters needed)
- Market noise (news/events) are not included
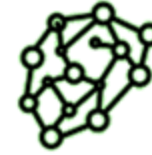- Potential Weak points in the model itself

What could be done better?

Richer Data

- Company-specific signals (e.g.: earnings dates, news sentiment, insider trades)
- More data that reflects the market noise (Interest rates or relatable ETF's

Advanced Model

- Switch to transformer and or improve the current model (hyperparameters, training time, or deeper architecture

Give the LSTM **more meaningful** information about what drives price changes
&
Improve how well the model learns relationships and avoids **overfitting**

THANK YOU!