PORTOFOLIO

DATA SCIENCE
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FINTECH

PREDICTING APPLE (AAPL)
STOCK CLOSING PRICES USING

Profile

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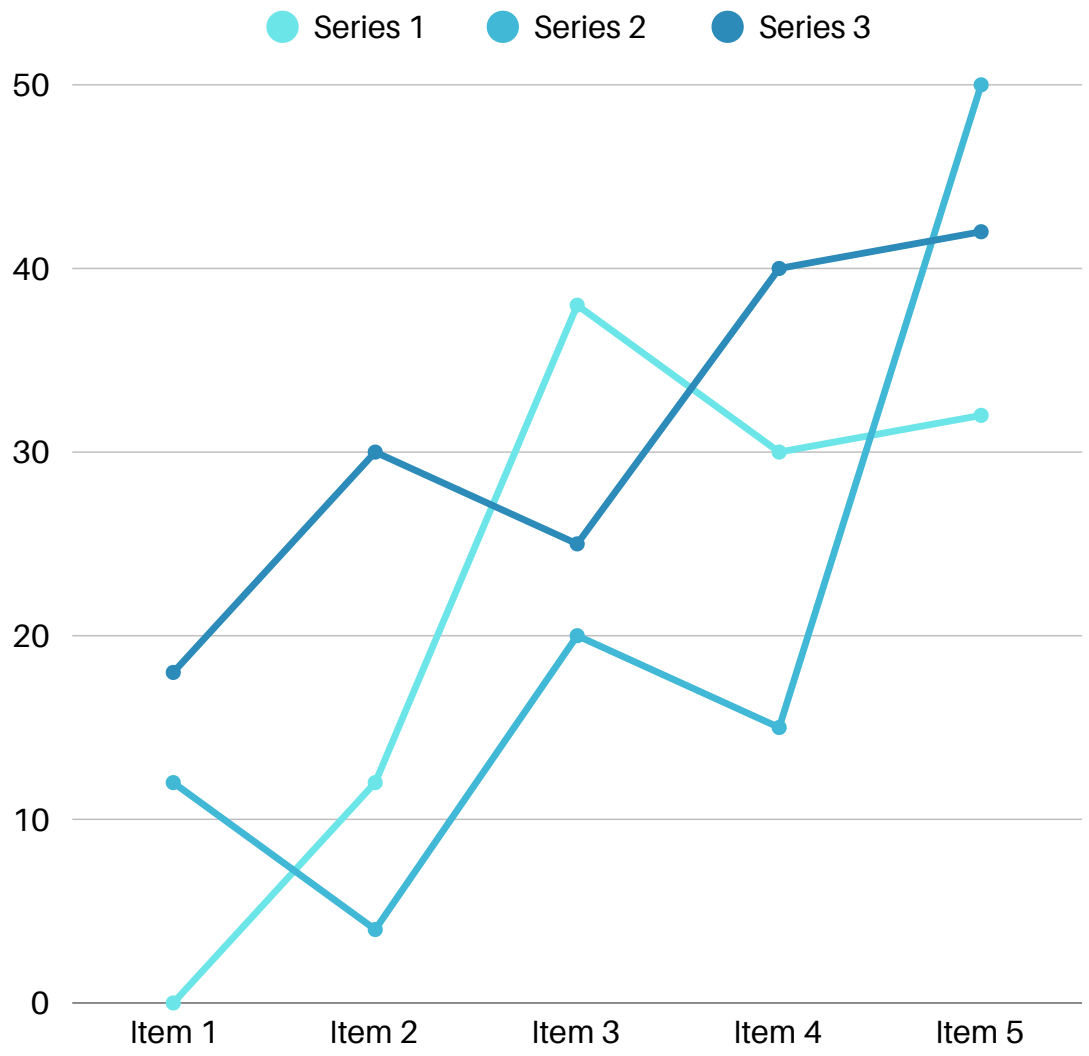
PROBLEM

Stock price prediction is a complex and challenging task due to the highly volatile and non-linear nature of financial markets. Investors and traders seek accurate forecasting models to make data-driven investment decisions, minimize risks, and maximize returns.

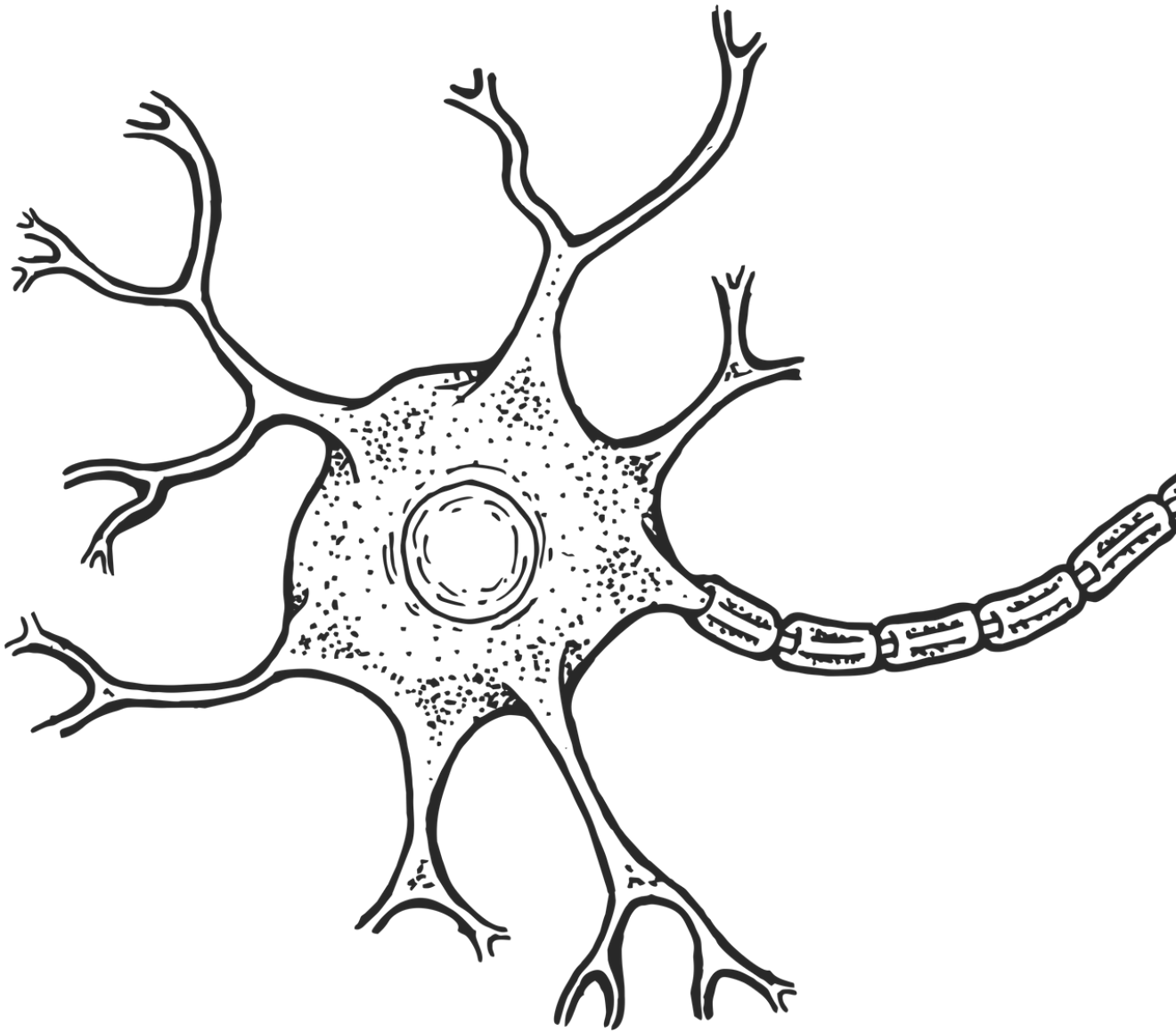
Data Collection

This project aims to predict Apple Inc. (AAPL) stock closing prices for the next 7 days using a Deep Learning model (LSTM). The dataset is sourced from Yahoo Finance (yfinance library), covering historical stock prices, including open, high, low, close, and volume data.



MODELING

This project aims to predict Apple Inc. (AAPL) stock closing prices for the next 7 days using a Deep Learning model (LSTM). The dataset is sourced from Yahoo Finance (yfinance library), covering historical stock prices, including open, high, low, close, and volume data.



Result

The evaluation metrics for the LSTM model predicting AAPL stock prices for the next 7 days are as follows:

- Mean Absolute Error (MAE): 5.6466
- → On average, the predicted stock prices deviate by $5.65 from the actual closing prices.
- Mean Squared Error (MSE): 43.6273
- → The squared differences between actual and predicted prices indicate the magnitude of errors. A lower MSE is preferable.
- Root Mean Squared Error (RMSE): 6.6051
- → The typical prediction error is around $6.61, reflecting the model's overall accuracy.
- R^2 Score: 0.9165
- → The model explains 91.65% of the variance in stock price movements, indicating a high level of predictive accuracy.

Insight

✅ Strong Predictive Power – With an R^2 score of 0.9165, the model performs well in capturing historical price trends and making accurate forecasts.
✅ Low Error Rate – The MAE of $5.65 and RMSE of $6.61 suggest that the model is reasonably accurate but still has room for improvement, especially considering stock price fluctuations.
🚀 Potential Improvements:

- Feature Engineering – Incorporating additional factors such as trading volume, moving averages, or sentiment analysis (news, social media) could enhance accuracy.
- Hyperparameter Optimization – Further tuning LSTM layers, dropout rates, and learning rates may reduce prediction errors.
- Hybrid Models – Combining LSTM with other models like XGBoost or ARIMA might improve performance.

Final Thought
The LSTM model has demonstrated strong predictive capabilities for short-term stock price forecasting. While results are promising, incorporating external market factors and advanced tuning could further increase accuracy and reliability for financial decision-making. 📈✨