ELEVATE LABS

INTERSHIP PROJECT

ON

Stock Price Trend Prediction with LSTM

Overview

Abstract

Forecasting stock prices is complex and data-driven.

• LSTM networks excel in time-series forecasting.

• Project uses historical data and financial indicators.

• LSTM outperforms traditional models like ARIMA.

Introduction

- Stock prices influenced by various factors.
- AI/ML improves accuracy in predictions.
- LSTM handles time-dependencies better than other models.

Literature Survey

1.•LSTM > RNN/CNN for stock prediction (Zhang et al.).

•Hybrid models (LSTM + Random Forest) show improvements.

•Sentiment analysis boosts predictive power.

System Architecture

- LSTM Architecture includes:
- Input, Forget, and Output Gates
- Memory Cells
- Learns sequential data for stock prediction.
- (Insert Architecture Diagram here)

Methodology

1. Data Collection (Yahoo Finance)
2. Preprocessing & Feature Engineering
3. Model Building (Sequential LSTM)
4. Evaluation (MAE, MSE, R^2)
5. Visualization of Predictions

Coding Highlights

- Tools: TensorFlow, Keras, Pandas, YFinance
- LSTM Layers: 50 → 60 → 80 → 120 units
- Dropouts for regularization
- Min Max Scaler used for normalization

Visual Results

- **Close Price Visualization**

- **100 & 200 Day Moving Averages**

- **Predicted vs Actual Prices**

- **(Insert graphs/screenshots here)**

Performance Metrics

- **MAE: 6.54%**
- **R^2 Score: 0.97**
- **High prediction accuracy**
- **(Insert R^2 bar chart and scatter plot)**

Model Comparison
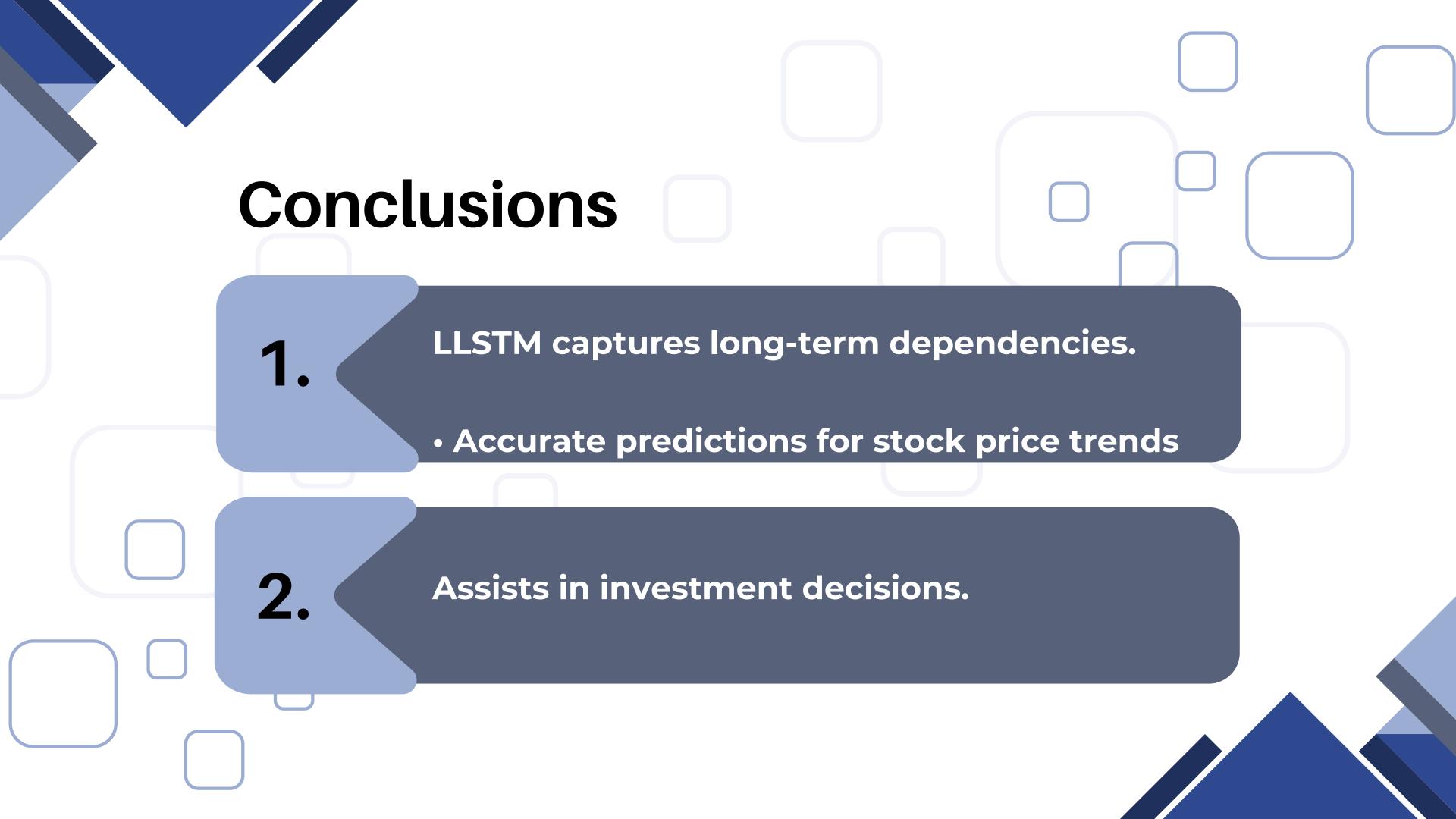
- **Accuracy**
- **Precision**
- **Recall**
- **F1 Score**
- **(Insert comparison chart/table)**

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Conclusions

1. **LLSTM captures long-term dependencies.**

• **Accurate predictions for stock price trends**

2. **Assists in investment decisions.**

Future Enhancements

- **Real -time data integration**

- **Add sentiment & macroeconomic indicators**

- **Use stacked/bidirectional LSTM**

- **Apply ensemble methods**

- **Enhance model interpretability**

Thank You