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Tech Skills Trainer | AI/ML Consultant

Stock Price Forecasting

Build and evaluate a time series forecasting model using the historical stock price dataset from Yahoo Finance.

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PROJECT DESCRIPTION

Build and evaluate a time series forecasting model for predicting stock prices using the historical stock price dataset from Yahoo Finance. Students will use statistical methods and deep learning techniques to forecast future stock prices and analyze the accuracy of their predictions.

PROJECT DELIVERABLES

1. Model code
2. Forecasting result
3. Jupyter notebook with documentation

FURTHER INSTRUCTIONS (Optional Guidance)

1. Install required libraries with `pip install pandas numpy yfinance matplotlib seaborn statsmodels tensorflow`.
2. Download the historical stock price dataset using the `yfinance` library.
3. Load the dataset into a Pandas DataFrame and explore it for missing values and data consistency.
4. Handle missing data by interpolation or removing incomplete rows.
5. Visualize stock price trends over time using Matplotlib and Seaborn.
6. Split the data into training and testing sets, maintaining the chronological order.
7. Build a baseline model using statistical methods like ARIMA or Exponential Smoothing.
8. Implement a deep learning model such as LSTM or GRU for advanced forecasting.

9. Train the models on the training data and validate them using the testing data.
10. Evaluate the models using metrics like Mean Squared Error (MSE) and Mean Absolute Error (MAE).
11. Plot actual vs predicted prices to visualize model performance.
12. Document all steps in a Jupyter Notebook with Markdown explanations.
13. Save the forecasting results in a CSV file for reference.
14. Summarize model results and forecasting insights in the Jupyter Notebook.
15. Ensure deliverables include the model code, forecast results, and documented notebook.

Suggested Dataset:

- Dataset: Apple Inc. (AAPL) Stock Data:

```
import yfinance as yf

# Fetch historical stock price data
aapl = yf.Ticker("AAPL")
data = aapl.history(period="5y", interval="1d")

# Display the first few rows
print(data.head())
```

_____ BEST OF LUCK ... :)

THANK YOU!

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