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COS30018

Weekly Report

Task B.6

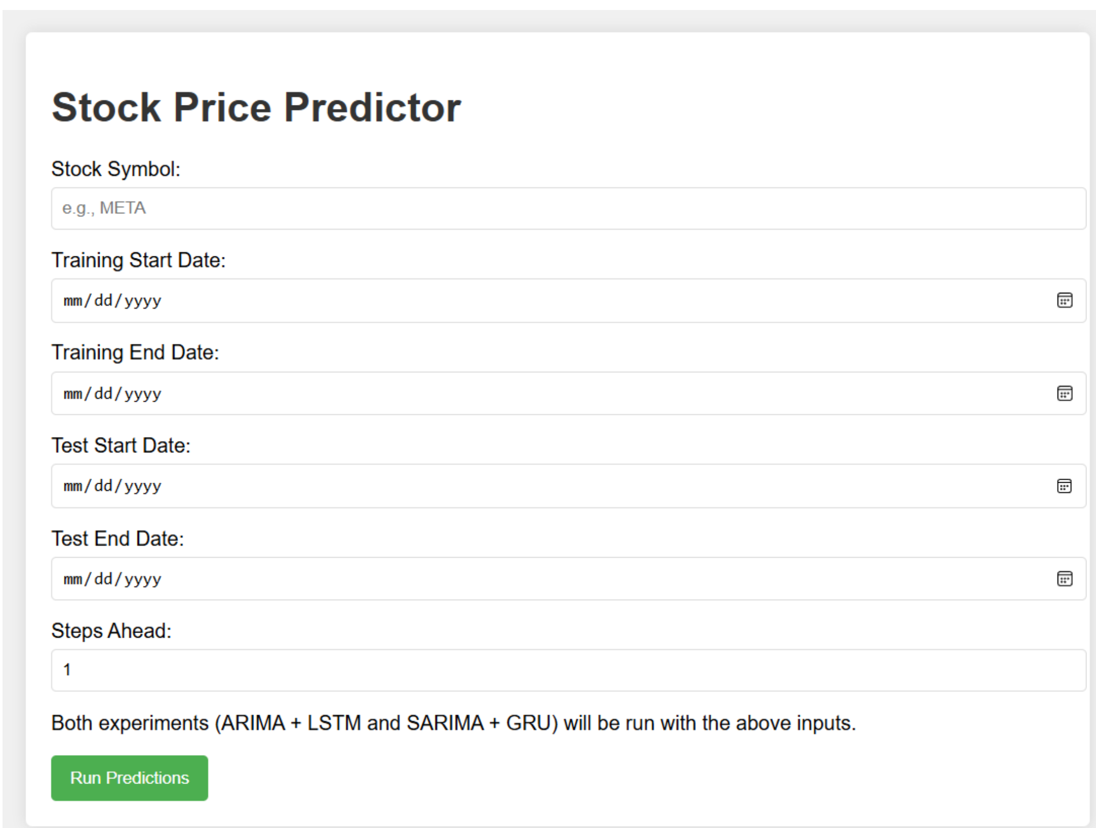
For this assignment, at first im having trouble with running the ARIMA function and the chart would not show up also it can't even run the SARIMA function at all. After adding a fallback for NaN values in y_arima to make sure the MSE can be calculated.

I replaced arima_forecasts.loc[pred_date] with arima_forecasts.get(pred_date, np.nan). The .get() method returns np.nan if the date isn't found in arima_forecasts, avoiding a KeyError.

Then if forecast_value is NaN (checked with pd.isna()), y_arima[i, j] is set to actual_prices[i, j] instead. This ensures y_arima always contains valid numbers.

I will add all the outcome into a folder for this task.

I also build a web interface for user to input the date and getting result on the website



```
C:\Users\ADMIN\Desktop\COS30018\Project\stock_predictor.py:179: UserWarning: Starting a Matplotlib GUI outside of the ma
in thread will likely fail.
  plt.figure(figsize=(12, 6))
Experiment 2 completed
Rendering results page
Template rendered successfully
127.0.0.1 - - [04/Apr/2025 12:32:26] "POST / HTTP/1.1" 200 -
127.0.0.1 - - [04/Apr/2025 12:32:26] "GET /static/style.css HTTP/1.1" 304 -
Rendering index page
127.0.0.1 - - [04/Apr/2025 12:34:06] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [04/Apr/2025 12:34:06] "GET /static/style.css HTTP/1.1" 304 -
Rendering index page
127.0.0.1 - - [04/Apr/2025 12:52:11] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [04/Apr/2025 12:52:11] "GET /static/style.css HTTP/1.1" 304 -
Form submitted!
Inputs: META, 2020-01-01, 2023-12-31, 2024-01-01, 2024-12-31, 5
Running Experiment 1: ARIMA + LSTM
[*********************100%***********************]  1 of 1 completed
Performing stepwise search to minimize aic
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=6657.054, Time=1.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6653.059, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6653.330, Time=0.20 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6653.396, Time=0.19 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=6651.532, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=6654.338, Time=1.23 sec

Best model:  ARIMA(0,1,0)(0,0,0)[0]
Total fit time: 3.106 seconds
Epoch 1/5
```

Prediction Results for META

Experiment 1: ARIMA + LSTM

Mean Squared Error Results

Day 1 Ahead

DL MSE: 276.4097

ARIMA MSE: 0.0000

Ensemble MSE: 69.1024

Day 2 Ahead

DL MSE: 306.0659

ARIMA MSE: 0.0000

Ensemble MSE: 76.5165

Day 3 Ahead

DL MSE: 395.8350

ARIMA MSE: 0.0000

Ensemble MSE: 98.9588

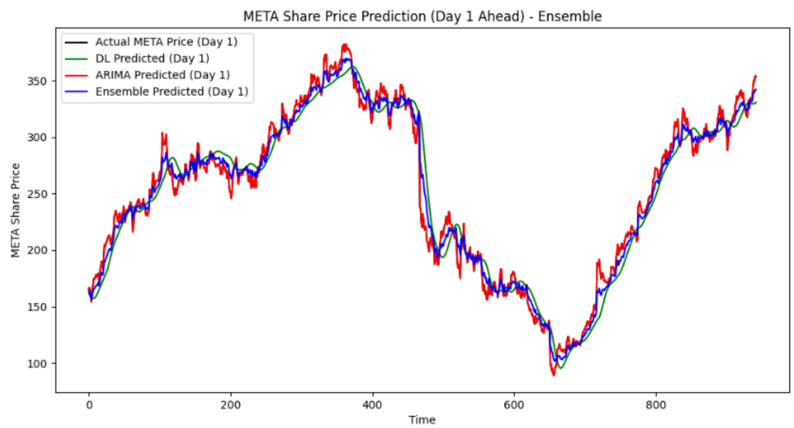
Day 4 Ahead

DL MSE: 465.4741

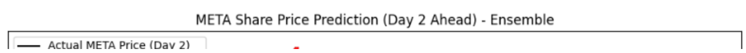
Ensemble MSE: 116.6373

Prediction Plots

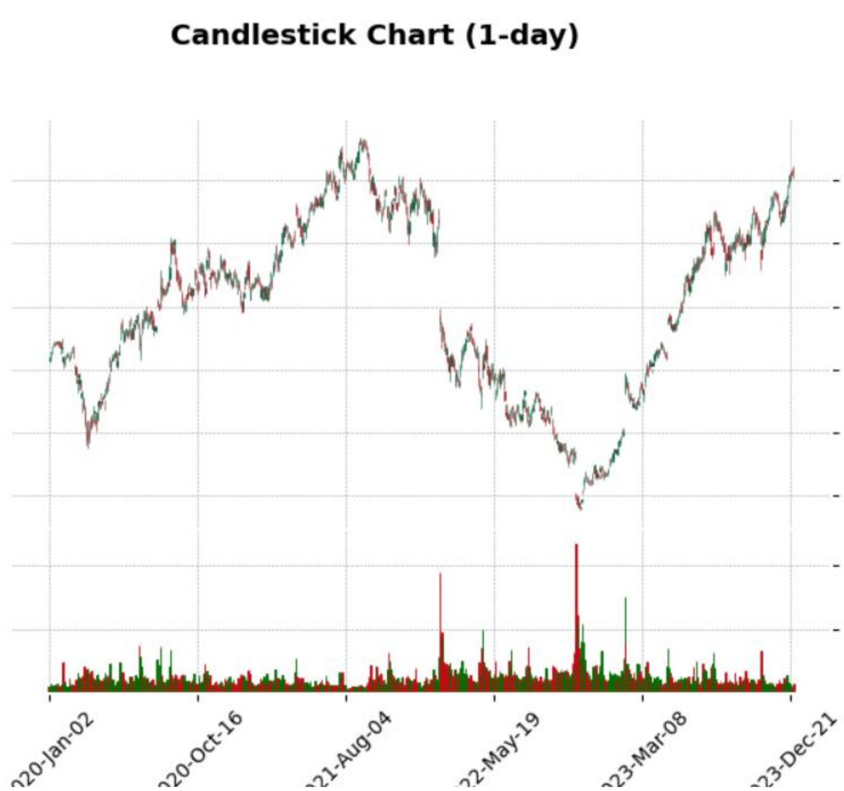
Day 1 Ahead Prediction



Day 2 Ahead Prediction



Candlestick Chart



Boxplot Chart