GROUP WORK PROJECT # 3 MScFE 642: Deep Learning for Finance
Group Number: 6888

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Statement of integrity: By typing the names of all group members in the text boxes below, you confirm that the assignment submitted is original work produced by the group (excluding any non-contributing members identified with an "X" above).

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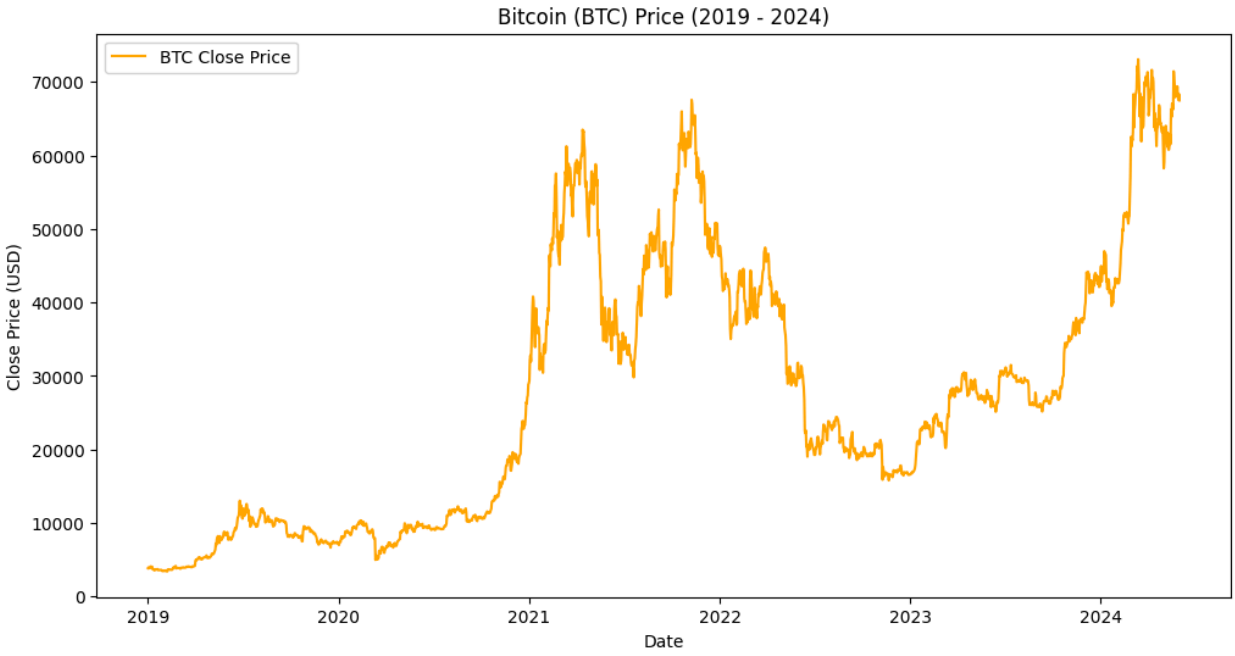
Team member 3	

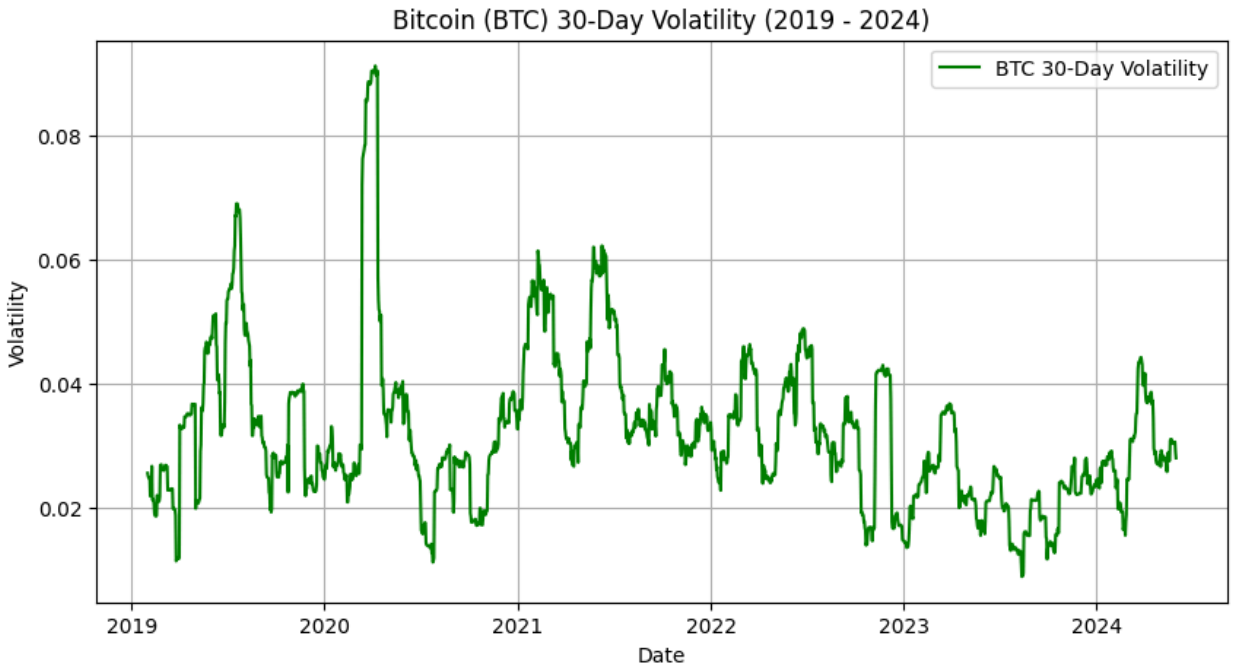
Use the box below to explain any attempts to reach out to a non-contributing member. Type (N/A) if all members contributed.
Note: You may be required to provide proof of your outreach to non-contributing members upon request.

Step 1

a.



This is a data set of Bitcoin from 2016 to 2024. It is observed from the chart above that it is a highly volatile security. It experienced a sudden decline in 2021 after reaching a record price of a little over $60,000. Moreover, it experienced an average increment from the last quarter of 2023 to the first month in 2024.



It is also observed that Bitcoin is a very volatile security.

Step 2

C. Using a single test split only evaluates the model for one fixed time. This has so many setbacks as it does not truly demonstrate real life situations or example because there are always changes in data. The walk forward methods both the one with 100 observations and 500 observations, allows for continuous adaptation. They provide a robust assessment of the model over the time set.

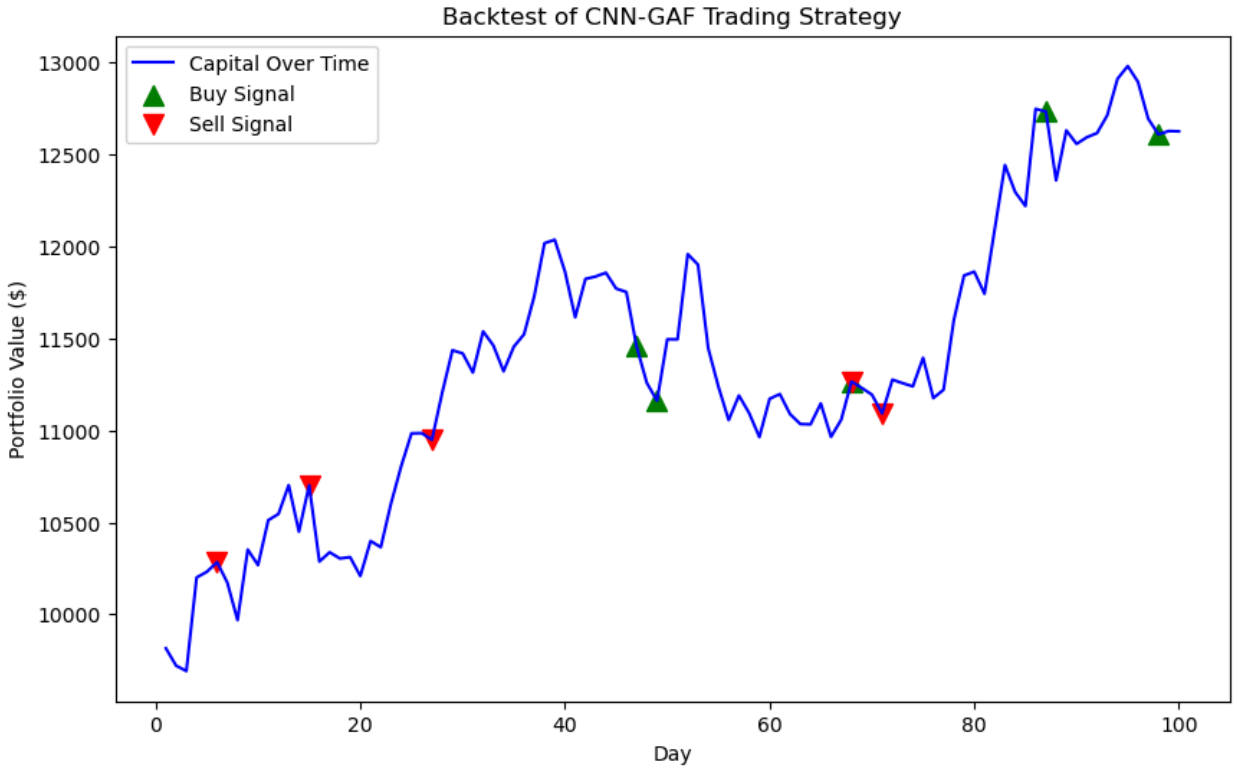
D. In the walk-forward method with non-anchored 500 observations for both the testing and the training, we observed no overlapping can lead to more fluctuations in the model's performance. This happened as a result of different features of the data in each step. In the walk forward method with 100 observations for both training and testing, we experienced some overlapping; moreover, that led to consistent results because the model is able to use the same data in the successive windows which reduces the performance changes like the one in Part a.

Also, the mean squared error (mse) varies so significantly with part A having an mse of 771,662.012 which explains that there are higher fluctuations with this and also higher errors in predictions. In addition to that, there are profits and win ratings fluctuating with

about $4604.27 and 55.56% respectively. The mse for part b is 0.000454 which shows more stability and that is as a result of the overlap discussed earlier.

Step 3


Backtesting Trading Strategy Based on LSTM Predictions
Real Bitcoin Prices
Buy Signal
Sell Signal
Bitcoin Price
70000
60000
50000
40000
30000
0
50
100
150
200
250
300
350
Days


Backtest of CNN-GAF Trading Strategy
Capital Over Time
Buy Signal
Sell Signal
Portfolio Value ($)
13000
12500
12000
11500
11000
10500
10000
0
20
40
60
80
100
Day

D. There is more variability in the backtest results of part b which used 500 observations for both training and testing sets than part c which used 500 observations for training and 100 observations for testing because each test set is independent of the training set. In part c, there is a potential for overlap.

Yes, overfitting hasn't disappeared but has diminished because of the smaller text size.