PREDICTING Q4 RESTAURANT EQUITY PRICES

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BUSINESS UNDERSTANDING

Stakeholder: New York State Transportation Workers Pension Fund.

Task: Predicting top 3 Q4 American restaurant equity performers and picking top 3 worse restaurant equity performers.

DATA UNDERSTANDING

In order to predict future equity prices, I need past equity prices. I used over 5 years of closing prices from Yahoo Finance.

In order to predict future COVID deaths, I need past COVID death numbers. I obtained those from the CDC.

yahoo! finance

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

ROI%

$$ROI\% = \frac{\text{final predicted price} - \text{final observed price}}{\text{final observed price}} \times 100$$

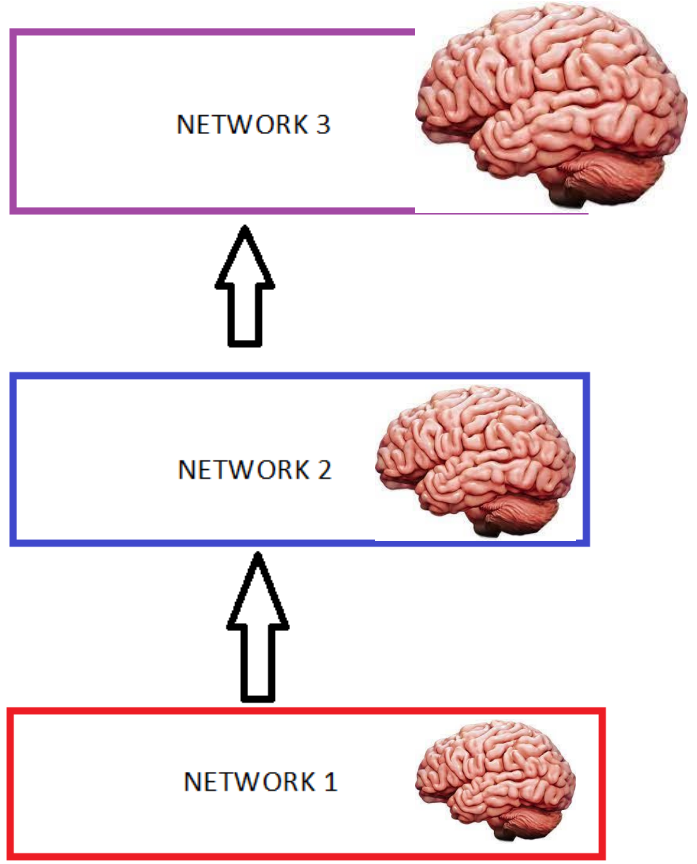
MODELING

To calculate the daily number of COVID deaths for the rest of the year, I used an algorithm from Facebook called Prophet.

To calculate the stock prices with the COVID number generated from Prophet, I used a Long Short Term Memory neural network (LSTM) .

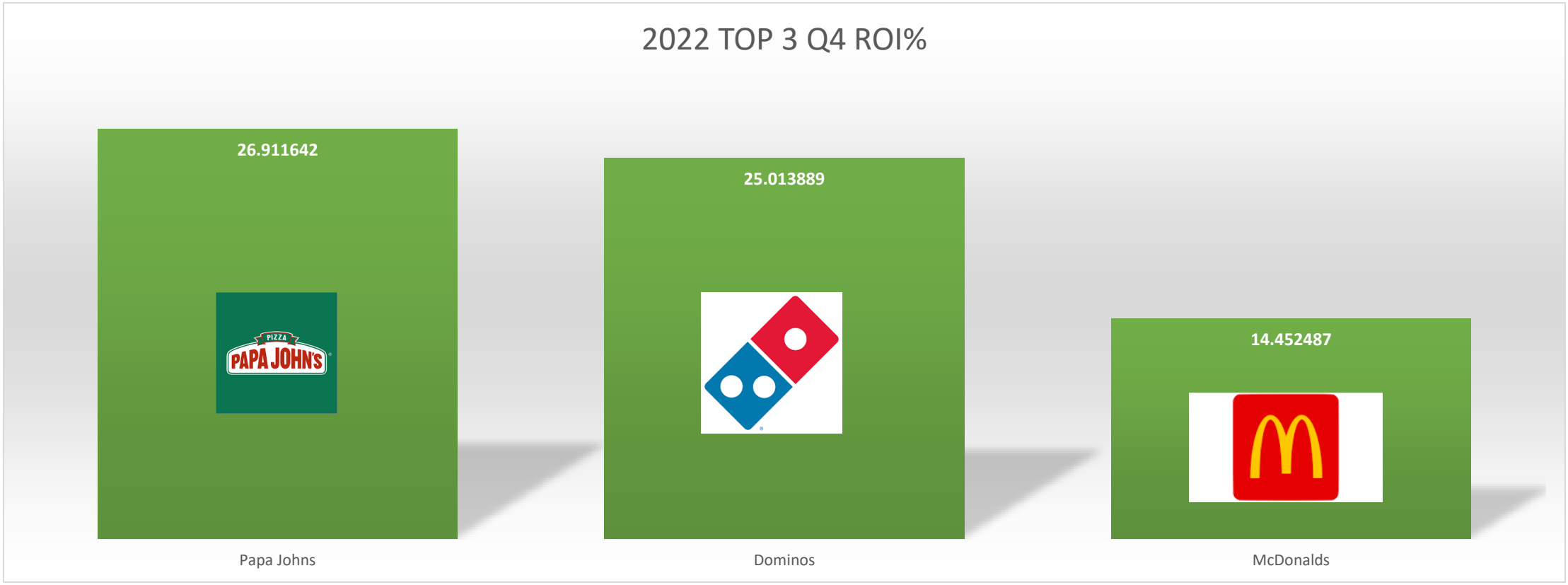
LSTM
(Long Short Term Memory)

- An LSTM is a type of neural network (a computing system modeled on the human brain) that handles long term data especially well, can learn from data multiple times, and can potentially learn and improve with each pass.



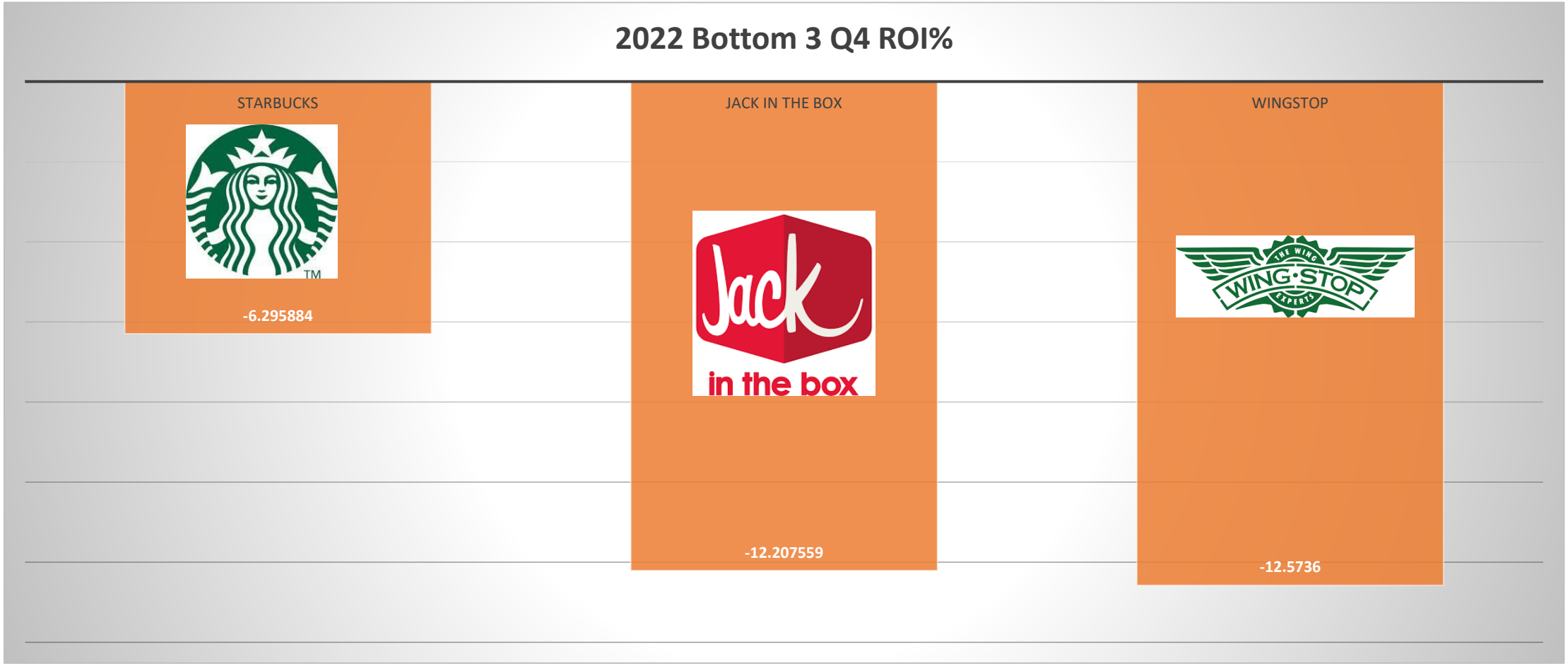
RECOMMENDATION: TOP 3 PERFORMERS

- The top 3 performers were Papa Johns, Dominos, and McDonald's.



RECOMMENDATION: BOTTOM 3 PERFORMERS

The bottom 3 performers were Wingstop, Jack in the Box, and Starbucks.



CONCLUSION

The top performers were Papa Johns, Dominos and McDonalds while the bottom 3 were Wingstop, Jack in the Box, and Starbucks.

2 pizza chains in the top 3 is fascinating and suggests their immunity to Q4 problems like COVID surges and bad weather.

NEXT STEPS

mproving the COVID Death predictions. My predictions had a mediocre MAPE(Mean Absolute Percentage Error) among the predictors that the CDC lists at their website. The predictions could be improved by ncluding other variables like mask use and weather into the model

Using COVID infection rates instead of death rates may yield better results.

Adding more variables like inflation rate, interest rates, and commodities prices to the price prediction model may provide illuminating results.

- Thanks
- Github:https://github.com/icapeli/Restaurant_Sector_2022_LSTM