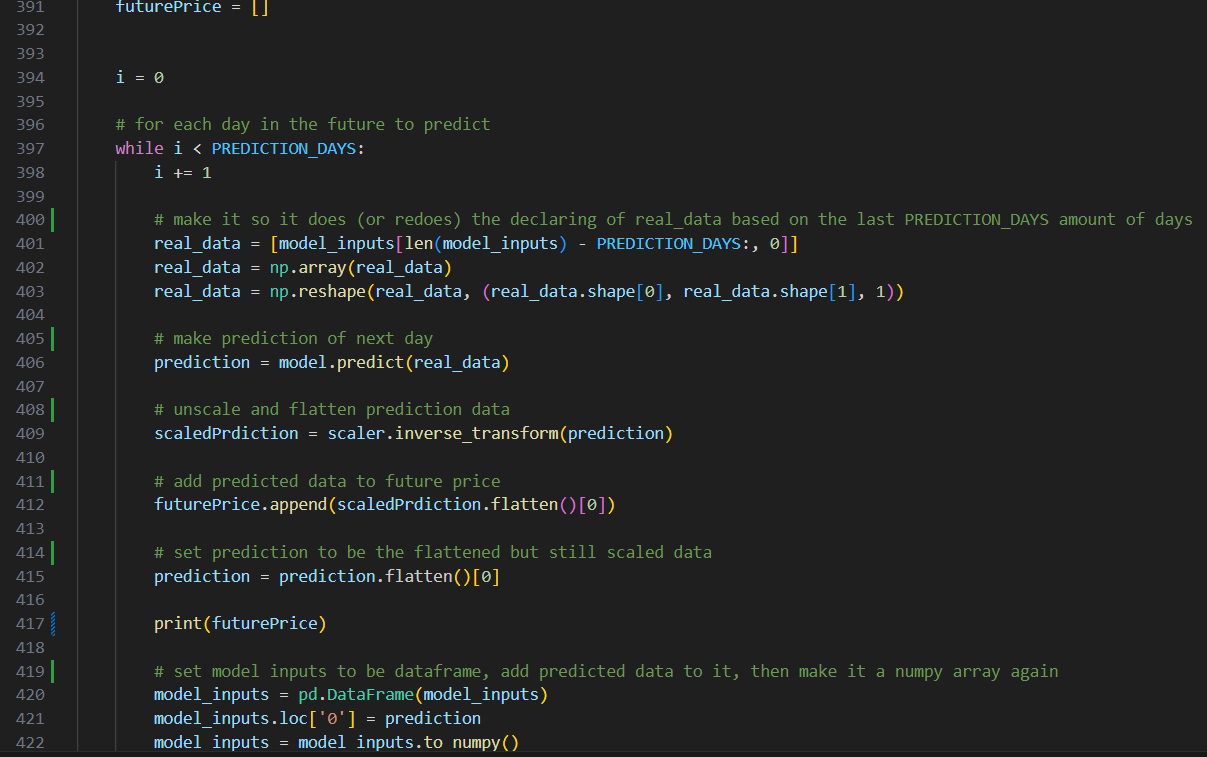
**Title:** Task B-5 Report

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**Task information:**

Subtask 1:

For this subtask I had to make the program go from predicting only one day into the future, to N days in the future (multistep). At first I had some difficulty figuring out how to do this. I found a bunch of tutorials of how to do this, but all of them had some issue about them which meant I couldn’t use them. What I ended up doing was making a loop to go through each future day that needs to be predicted. In this loop, it would first declare the ‘real\_data’ npArray from model\_inputs. It would then make the prediction of the next future day, and add it to real\_data. It then adds predicted value to futurePrice and to the end of model\_inputs.



The next step was to make this predicted data actually display on the graph. This was fairly easy to do except that it would not appear after the test data. To do this I had to make a dataframe from futurePrice and add appropriate index values so the data would appear after the test data

A screen shot of a computer code

Description automatically generated

The multistep prediction data can be seen on the graph below

A graph with green and black lines

Description automatically generated

Subtask 2:

For this subtask I had to make it so the program had hyperparameters and test them.  
  
  
ARIMA

Hyperparameter 1

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A graph showing the price of a stock market

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Hyperparameter 2

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A graph showing the price of a stock market

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Hyperparameter 3

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Hyperparameter 4

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A graph showing the price of a stock market

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Hyperparameter 5

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SARIMA

Hyperparameter 1:

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A graph showing the price of a stock market

Description automatically generated

Other SARIMA hyperparameters

A screen shot of a computer

Description automatically generated

The second and third SARIMA hyperparameters were not run because they would take over 15 minutes to run

References:

**Follonier, F 2020, *Stock Market Prediction using Multivariate Time Series and Recurrent Neural Networks in Python*, relataly, viewed 21/09/2023, <https://www.relataly.com/stock-market-prediction-using-multivariate-time-series-in-python/1815/>.**