

The background is a dark blue gradient with several overlapping, semi-transparent financial charts. On the left, a line chart with white circular markers and orange centers connects several points. In the center, a bar chart with blue bars is visible, with a data label '289.33' next to one of the bars. To the right, another line chart with blue markers and a dashed line is partially visible. The overall aesthetic is modern and data-driven.

Stock Market Analysis

Stock Prediction of Sainsbury's using RNN

Exploring Sainsbury's stock valuation, we aim to predict future prices using our proprietary model. This study focuses on unraveling market intricacies and refining our model for precise forecasting.

The Sainsbury's logo is displayed in a bold, orange, sans-serif font. Below the text is a thin, curved orange line that starts under the 'S' and ends under the 'y'.

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for the football

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Subject to availability. While stocks last.

Groceries

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World flavours

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Sainsbury's Bank

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NEW
Credit card
range

Great offers from home, electrical and entertainment

Overview of company



Sainsbury's, a dynamic retail giant, offers groceries, general merchandise, and clothing across a network of outlets, ranging from supermarkets to convenient stores, all under the banners of Sainsbury's, Habitat, and Argos.

VISION OF COMPANY



No. of Employs

+1,70,000

Locations

Sainsbury's has a presence in over 1400 locations around the UK

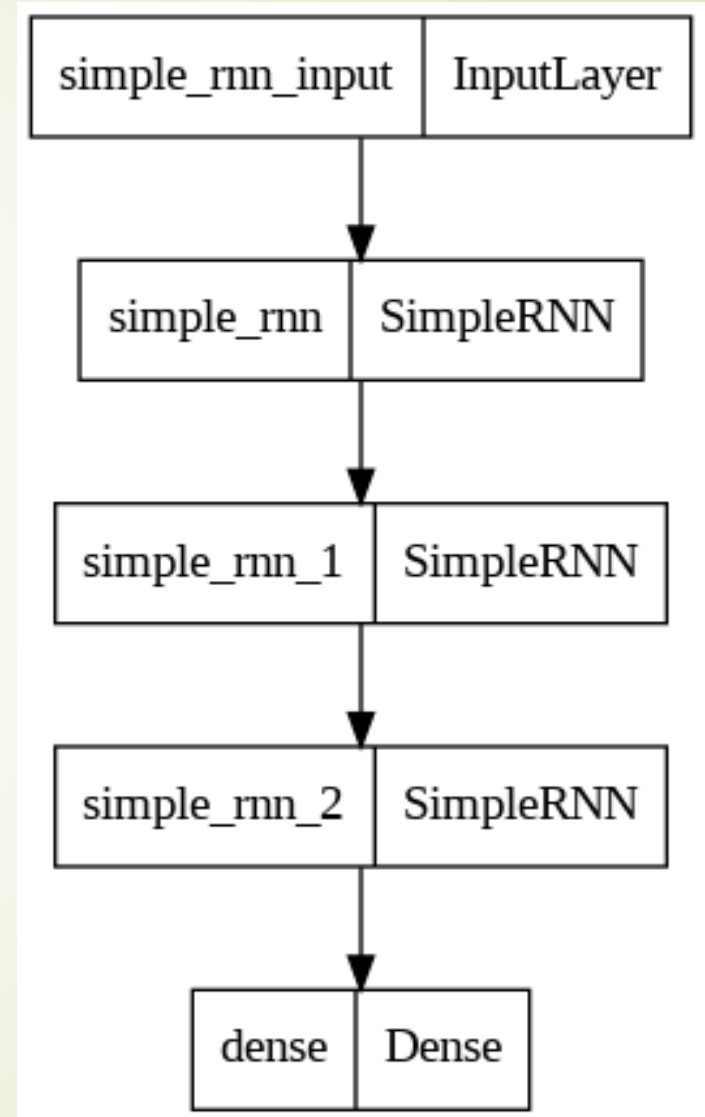


Data Collection

- Sainsbury's was established in 1869, when John James Sainsbury and his wife Mary Ann opened a shop at 173 Drury Lane in Covent Garden, London. Sainsbury started as a retailer of fresh foods and later expanded into packaged groceries such as tea and sugar. Right now over a period the net worth of the company is \$8.88B. Whose other subsidiaries also include Sainsbury's Bank.
- We're really getting into the money side of things, looking at how Sainsbury's is doing financially and in the stock market. We're checking out important numbers like how much they're making, their profits, and the prices of their stocks. It helps us see what's going on with Sainsbury's in the retail world.
- In order to get data, we've searched data of Sainsbury's for almost 12 years and 11 months, checking out their info from Yahoo Finance using yfinance. We're using Keras and its libraries to carefully organize our data.
- After fetching data using yfinance, we intentionally split our dataset, allocating 80% for training and 20% for testing. Subsequently, we create separate training and testing generators.

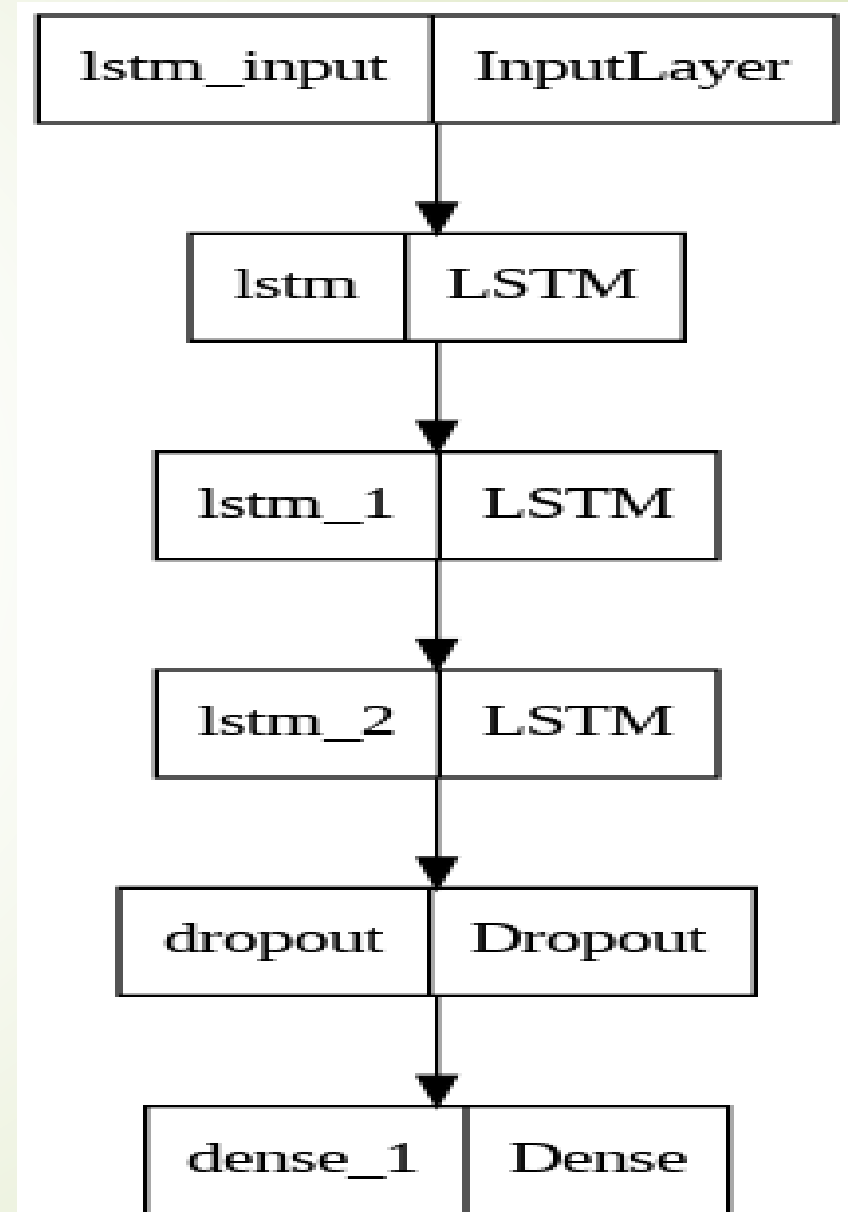
Creating a RNN Model

- Here, we have created RNN model with 3 different layers of SimpleRNN and units are 40, 90 and 70 in chronological order.
- At the end of model we have added Dense for Regression with 1 unity.
- In order to run our model we compile it with “adam” optimizer, which is the best and known for RNN model.
- Moreover, we have used epochs to make our prediction more convenient.



Creating a LSTM Model

- After Making a wonderful RNN model, we have built a new model for prediction. i.e. LSTM model which is most common useful and operating tool in Machine learning field. LSTM is more accurate than other model and they are able to capture complex temporal dependency patterns, even when stacked in multi-layer networks .
- LSTMs are effective in capturing long-term dependencies and can handle highly nonlinear and non-stationary data.
- 5 layers has been taken where 3 of them used for LSTM layer, one with Dropout and the remaining for Dense. The respected units for LSTM layers are 10, 50 and 120. Dropout value is given by 0.02 with 1 unity in Dense. Furthermore we have compiled it with same algorithm.

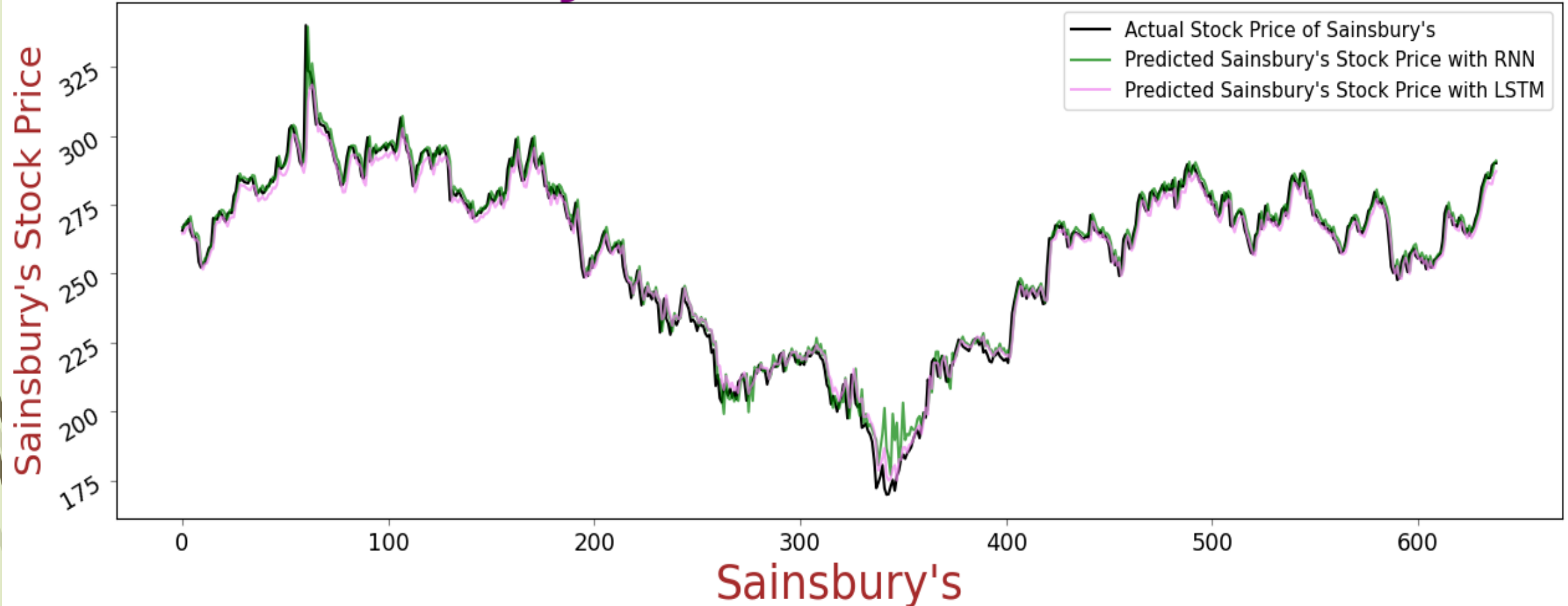


Prediction By RNN and LSTM Model

- With the use of our library such as `scalar`, `inverse_transform` of we have predicted both the values `rnn_predictions` and `lstm_predictions` and also recalled the actual price of stock value which was downloaded earlier.
- With given data we have created predictable chart as well plot the actual prices of stock.
- The Chart as below:

Prediction By RNN and LSTM Model

Sainsbury's Stock Price Prediction

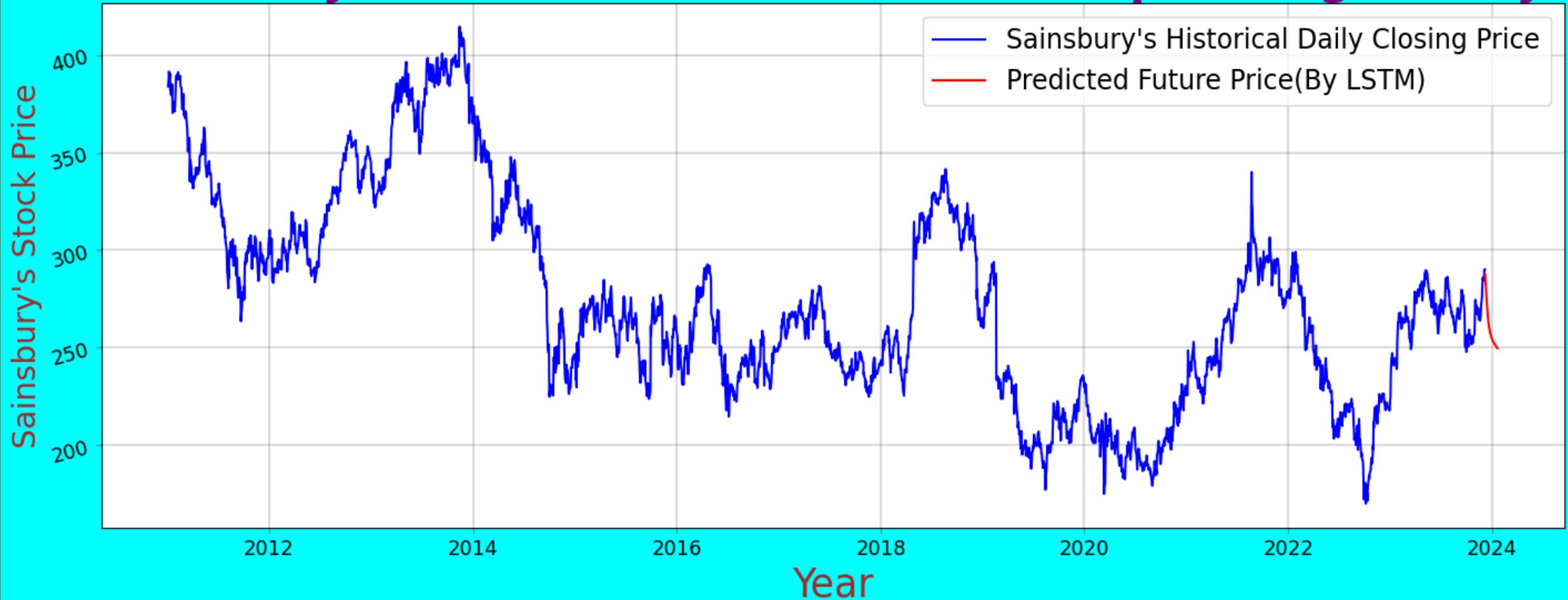


Future Prediction with LSTM Model

- The `predict_future_days` function forecasts future values in a time series using a pre-trained machine learning model(LSTM Model). We have taken parameters such as `model`, `base_data`, `days_to_predict`, and `scaler`. Employing a sliding window technique, it iteratively predicts and updates future values.
- This versatile function is valuable for diverse applications, including financial market analysis, where understanding and forecasting future trends are essential.
- After going through our model, the chart displays the future forecast of Sainsbury's stock price for the upcoming 45 days.

Future Prediction with LSTM Model

Sainsbury's Stock Price Prediction for Upcoming 45 Days



Result

- After conducting a comprehensive analysis and leveraging our model, we present the forecasted Sainsbury's stock prices for the next 45 days. The chart above depicts the projected stock prices, with the x-axis representing the timeline in years and the y-axis denoting the corresponding stock prices.
- This visual representation provides insights into the anticipated trends and fluctuations in Sainsbury's stock over the specified time horizon.
- Additionally, if you have the actual stock prices for the same period, you can compare them with the predicted values to assess the accuracy of your forecasting model.
- We forecast 45 days ahead, plotting the historical closing prices in blue and the predicted future prices in red.
- The chart showcases the model's predictive capability, providing insights into potential trends.
- The title and labels are thoughtfully designed for clarity and aesthetics.
- The resulting plot is displayed, and the visualization is saved as "Future_prediction.png" for future reference.
- This succinct code encapsulates the entire process, from prediction to visualization, in a visually appealing manner.

References

- We have added links for coding of the model in 2 different platform.
- Please click over Here for [Colab URL](#)
- Please connect here for [GitHub](#)