STOCK PRICE PREDICTION

ProjectPro

INTRODUCTION

- A stock market is a public market for the trading of company stock.
- Stock market allows us to buy and sell units of stocks (ownership) of a company.
- If the company's profits go up,then we own some of the profits and if they go down, then we lose profits with them.
- If more sellers than buyers, stock prices tend to fall. Conversely, when more buyers than sellers, stock prices tend to rise

How To Read A Stock Table?

Date- day on which the stock is traded

High- high is the **highest** price at which a **stock** traded during the course of the day

Close- refers to the last **price** at which a **stock** trades during a regular trading session

	Date	Open	High	Low	Close	Volume
2	20-Jul-17	997.00	998.68	984.62	992.19	1418385
1	19-Jul-17	990.01	995.60	987.01	992.77	1412148

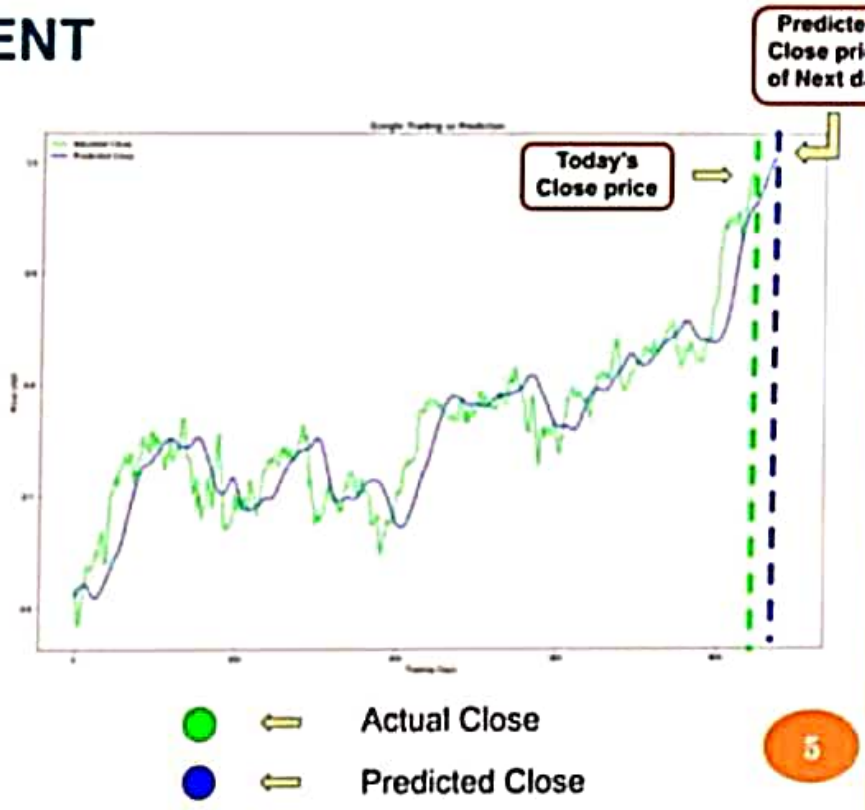
Open- price of the first trade for any listed **stock** is its daily **opening** price.

Low- lowest price at which a **stock** trades over the course of a **trading** day.

Volume- the number of **shares** or contracts traded in a security or an entire **market** during a given period of time

PROBLEM STATEMENT

- To accurately predict the future closing value of a given stock across a given period of time in the future.
- Use different machine learning and deep learning models available and compare them in terms of **graphical analysis.**



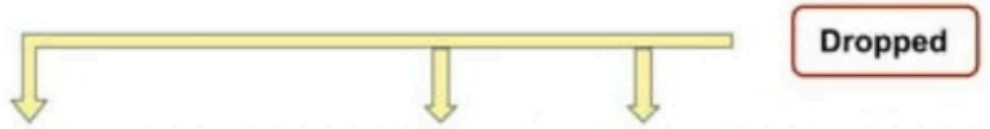
DATASET

The data used in this project is of the **Alphabet Inc**[3] from **January 1, 2005 to July 30, 2017,** this is a series of data points indexed in time order or a time series. Our goal was to predict the closing price for any given date after training

	Date	Open	High	Low	Close	Volume
2	20-Jul-17	997.00	998.68	984.62	992.19	1418385
3	19-Jul-17	990.01	995.60	987.01	992.77	1412148
4	18-Jul-17	973.36	990.85	972.04	986.95	1413335
5	17-Jul-17	976.32	983.35	970.80	975.96	1660464
6	14-Jul-17	974.00	977.54	970.15	976.91	1079608
7	13-Jul-17	970.80	978.70	964.80	968.85	1524571
8	12-Jul-17	960.86	969.63	957.04	967.66	1602115
9	11-Jul-17	950.52	954.89	945.12	953.53	1461247
10	10-Jul-17	941.95	953.13	941.95	951.00	1451460

Feature Importance

- Process of selecting a **subset** of relevant features for use in model construction.
- Feature selection methods include and exclude attributes present in the data without changing them.
- Here, in our case '**Date**','**High**' and '**Low**' attributes are dropped.



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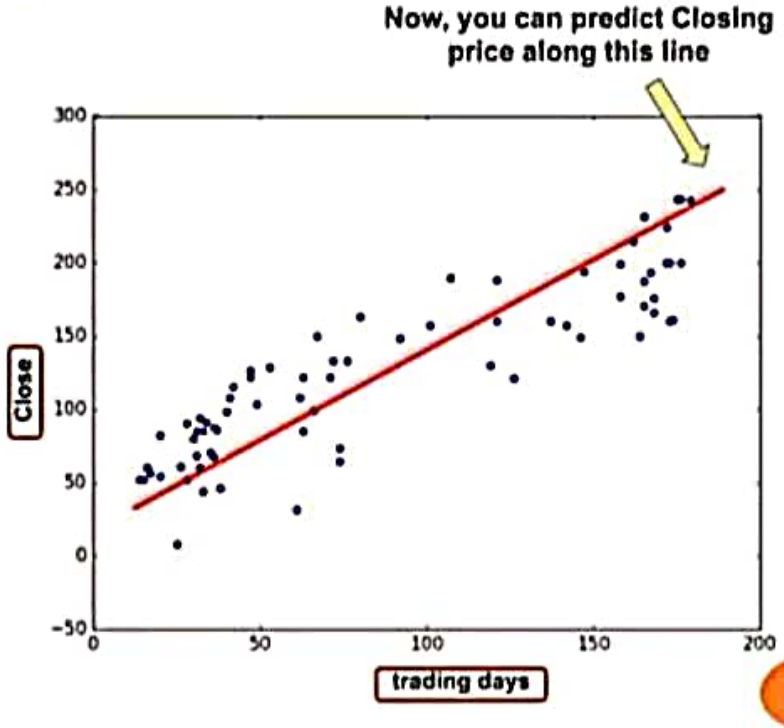
LINEAR REGRESSION

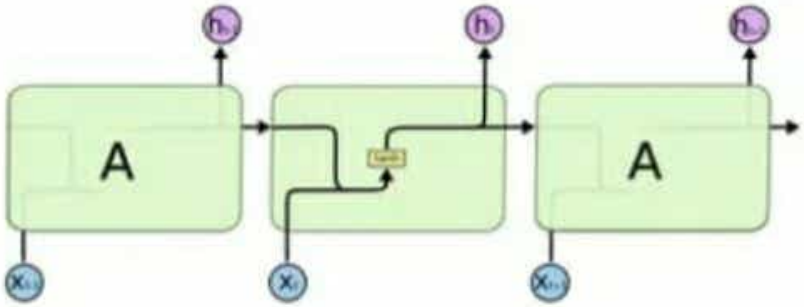
- Linear regression is an approach for predictive modeling to showcase the relationship between a scalar dependent variable **'Y'**, (in our case, we have **'Close'** attribute) and one or more independent variables **'X'** (**'Trading day'** attribute).



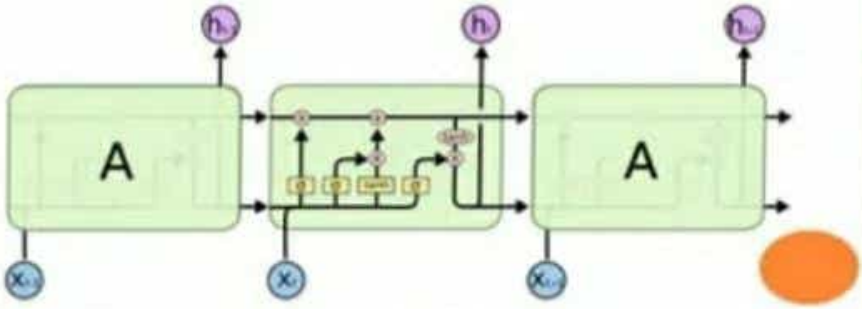
RECURRENT NEURAL NETWORK + LSTM

LSTM (Long Short Term Memory)

LSTMs are explicitly designed to avoid the long-term dependency problem. Remembering information for **long periods of time** is practically their default behavior, not something they struggle to learn!



Recurrent Neural Network



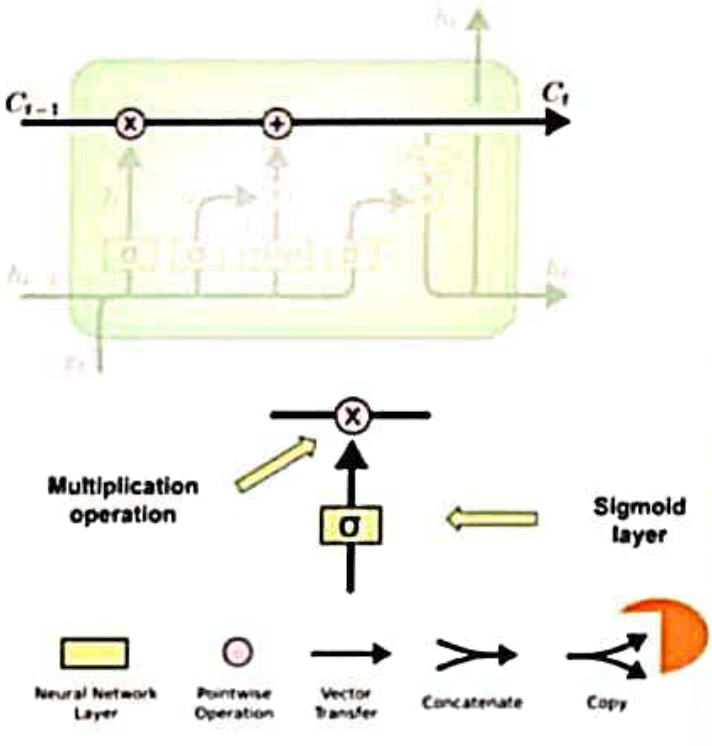
LSTM

RECURRENT NEURAL NETWORK + LSTM

LSTM (How it works?)

- The key to LSTM is the **Memory cell state** which stores the information. It runs straight down the **entire chain**.
- LSTM has the ability to **remove or add information** to these cell state, regulated by structures called **gates**.

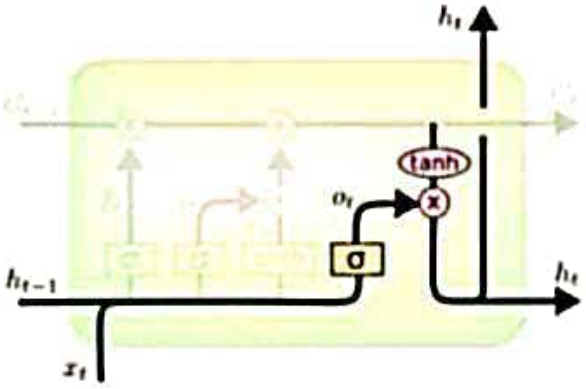
- **Gates** are composed of sigmoid neural net layer and a multiplication operation.
- Sigmoid layer outputs **zero** or **one**.



RECURRENT NEURAL NETWORK + LSTM

LSTM (How it works?)

- **First**, forget gate looks at h_{t-1} and x_t and outputs a number between 0 and 1.
- 1 represents "keep the information" and 0 represents "remove the information".
- **Second**, input gate decides which values will be updated, in order to do that a tanh layer creates a vector of C_t **(bar)**.
- Combining these two, create an update to the state.
- **Third**, It's time to update the old cell C_{t-1} to C_t
- **Fourth**, output will based on our cell state.
- a sigmoid layer will decides what parts of the cell state we're going to output.



Output Layer

$$o_t = \sigma\left(W_o\left[h_{t-1}, x_t\right] + b_o\right)$$

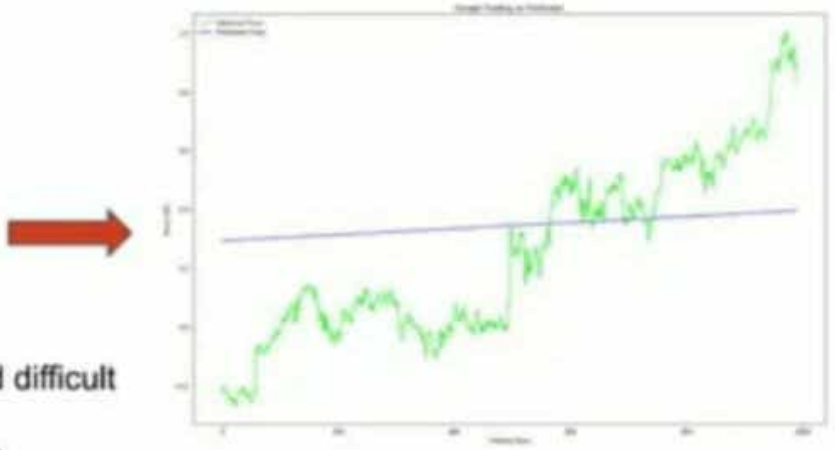
$$h_t = o_t * \tanh\left(C_t\right)$$

Current hidden layer information

CONCLUSION

Linear Regression

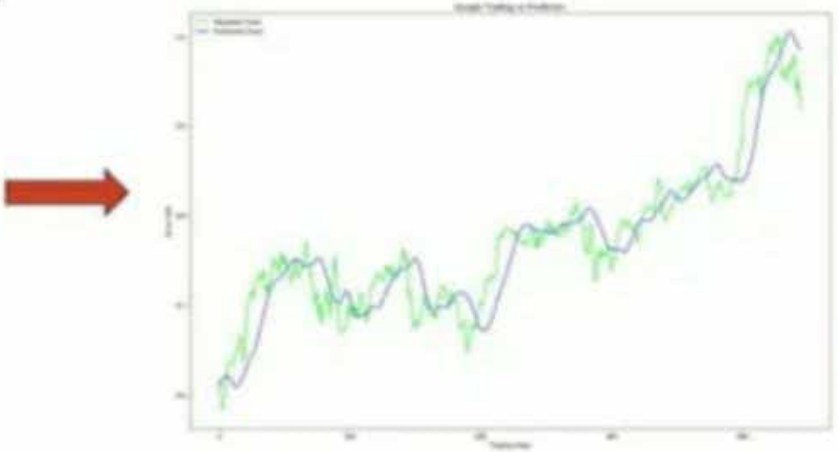
- Model does not fit properly



Stock price prediction is a complex problem and difficult to predict.
Machine learning model doesn't perform well as compared to Deep Learning model.

Recurrent Neural Network + LSTM

- Model fits properly



THANK YOU!