STOCK PREDICTION USING LSTM (LONG-SHORT TERM MEMORY) NETWORK

DATA

The data taken is of AAPLE STOCK . Two year data is taken from May 2015 to May 2017. The closing price is taken as the parameter for stock prediction. The total observation is 1258.

Training set and Test set

The first 65% or 817 observation is taken as training set and remaining 441 observation is taken as Test set.

MODEL

LSTM Networks-Long Short Term Memory networks-usually just called LSTM are a special kind of RNN, capable of learning long -term dependencies. They were introduced by Hockreiter & Schmidhuber(1997), and were refined and popularized by many people in following work.

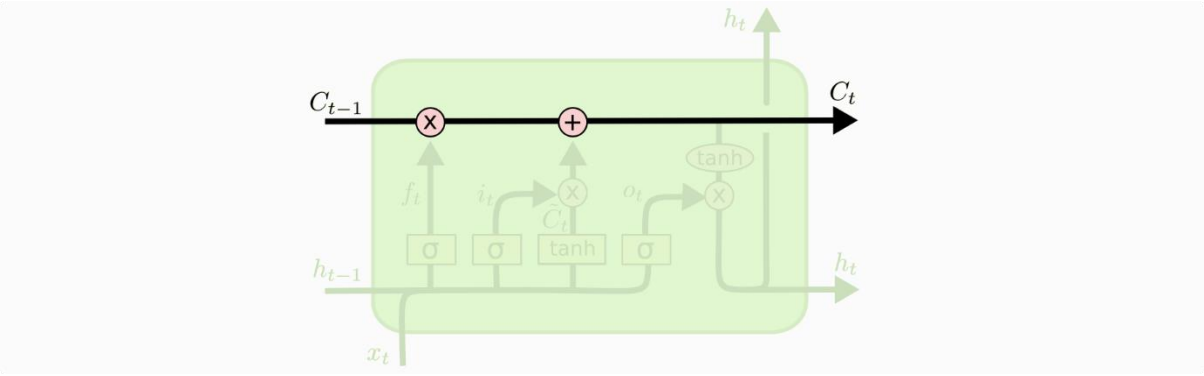
LSTMs are explicitly designed to avoid the long -term dependency problem. Remembering information for long periods of time is practically their default behavior, not something they struggle to learn.

All recurrent neural networks have the form of a chain of repeating modules of neural network. In standard RNNS. This repeating module will have a very simple structure, such as a single tanh layer.

The core Idea Behind LSTMs

The key to LSTMs is the cell state, the horizontal line running through the top of the diagram.

The cell state is kind of like a conveyor belt. It runs straight down the entire chain, with only some minor linear interactions. It's very easy for information to just flow along it unchanged.



The LSTM does have the ability to remove or add information to the cell state, carefully regulated by structures called gates.

Gates are a way to optionally let information through. They are composed out of a sigmoid neural net layer and a pointwise multiplication operation.

The sigmoid layer outputs numbers between zero and one, describing how much of each component should be let through. A value of zero means "let nothing through," while a value of one means "let everything through!"

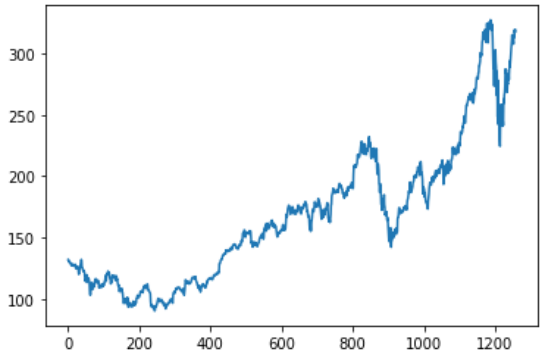
An LSTM has three of these gates, to protect and control the cell state.

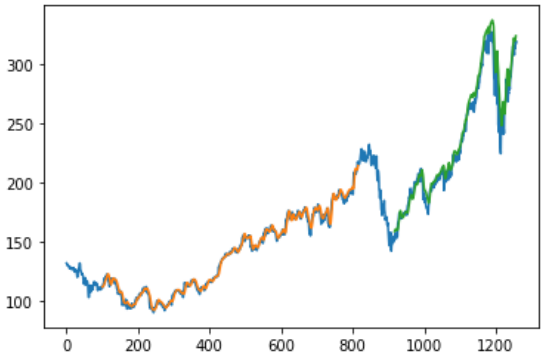
DATA PREPARATION FOR APPLYING THE MODEL

The window I have chosen is of 100 days. It mean it keep track of previous 100 to predict the next day stock price.

I have chosen tensor flow inbuilt function to implement the LSTM model.

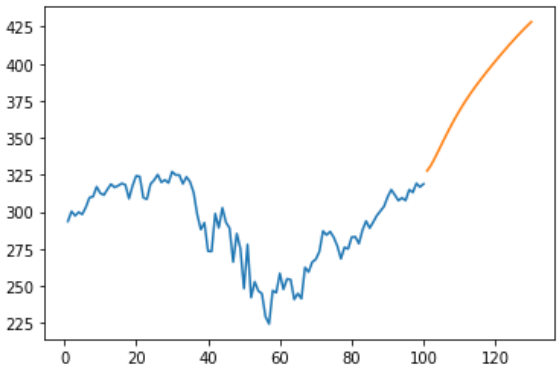
RESULT AND OBSERVATIONS





The 1) diagram is the actual data we have chosen of AAPL STOCK.

The 2) diagram orange colour curve is the training set and the green colour curve is our prediction curve.



The 3) diagram is when the blue curve is taken to predict the next day prediction. The orange curve shows the predictions.