Algorithmic Stock Predictor using Historical Data

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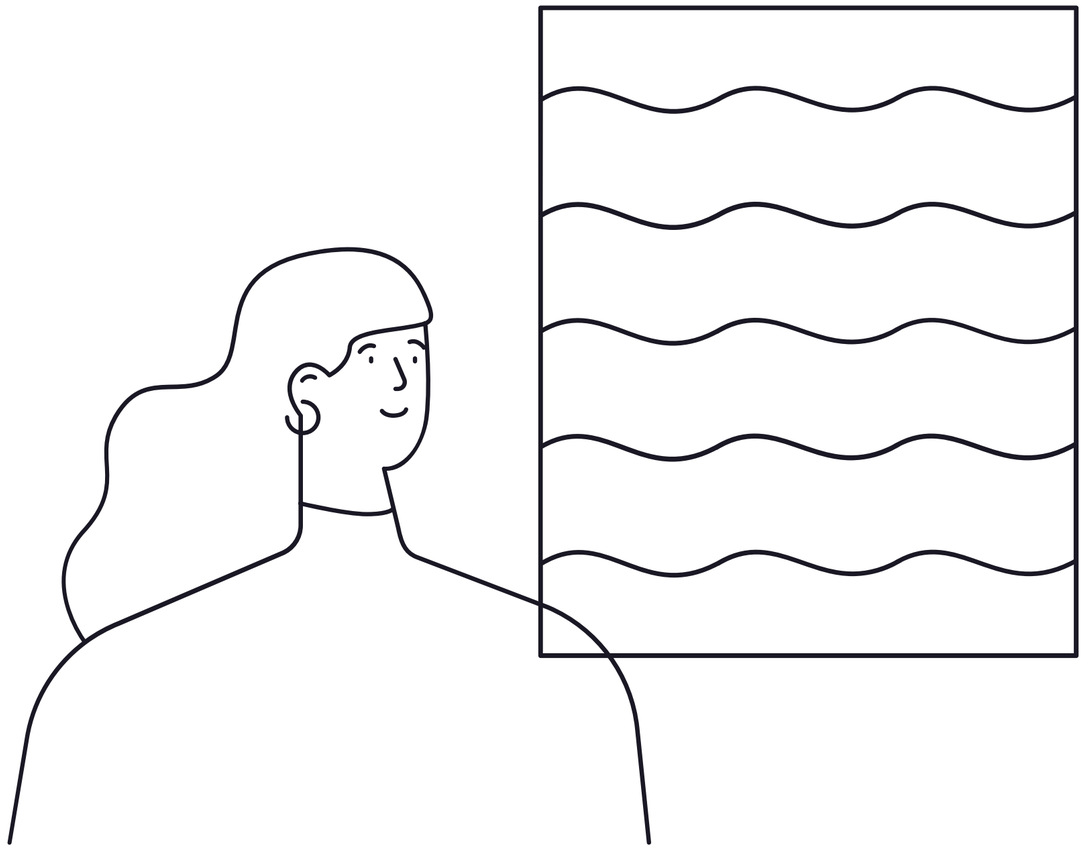
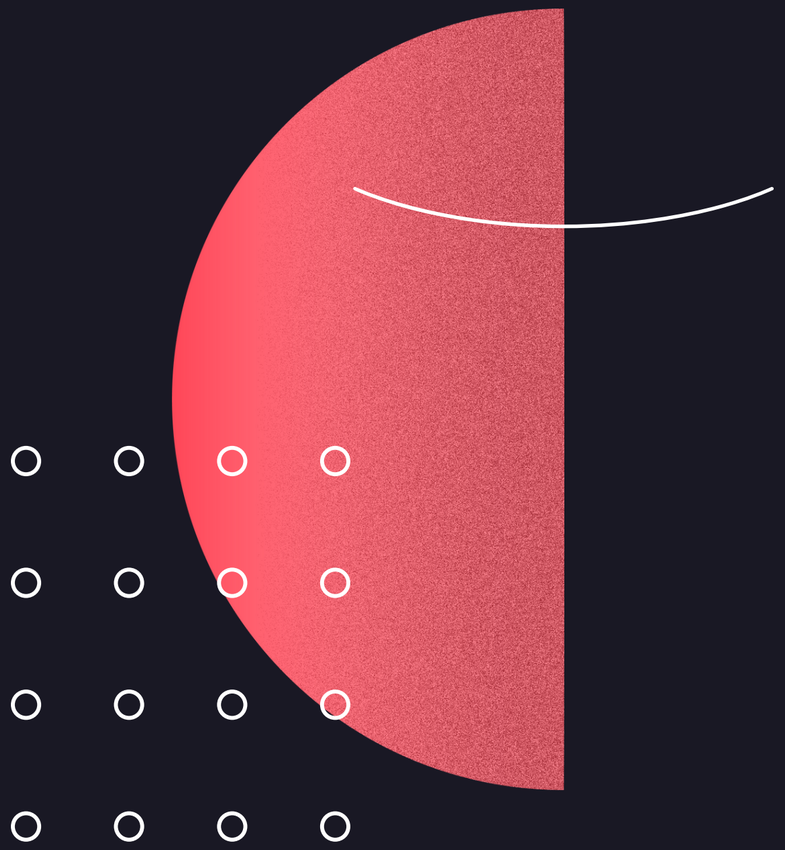
Introduction.

This project seeks to discuss the efficacy of the LSTM (Long Short Time Memory) Model in predicting the price patterns of stocks on the S&P 500 and predict the movement of a user's portfolio based on Historical Data.

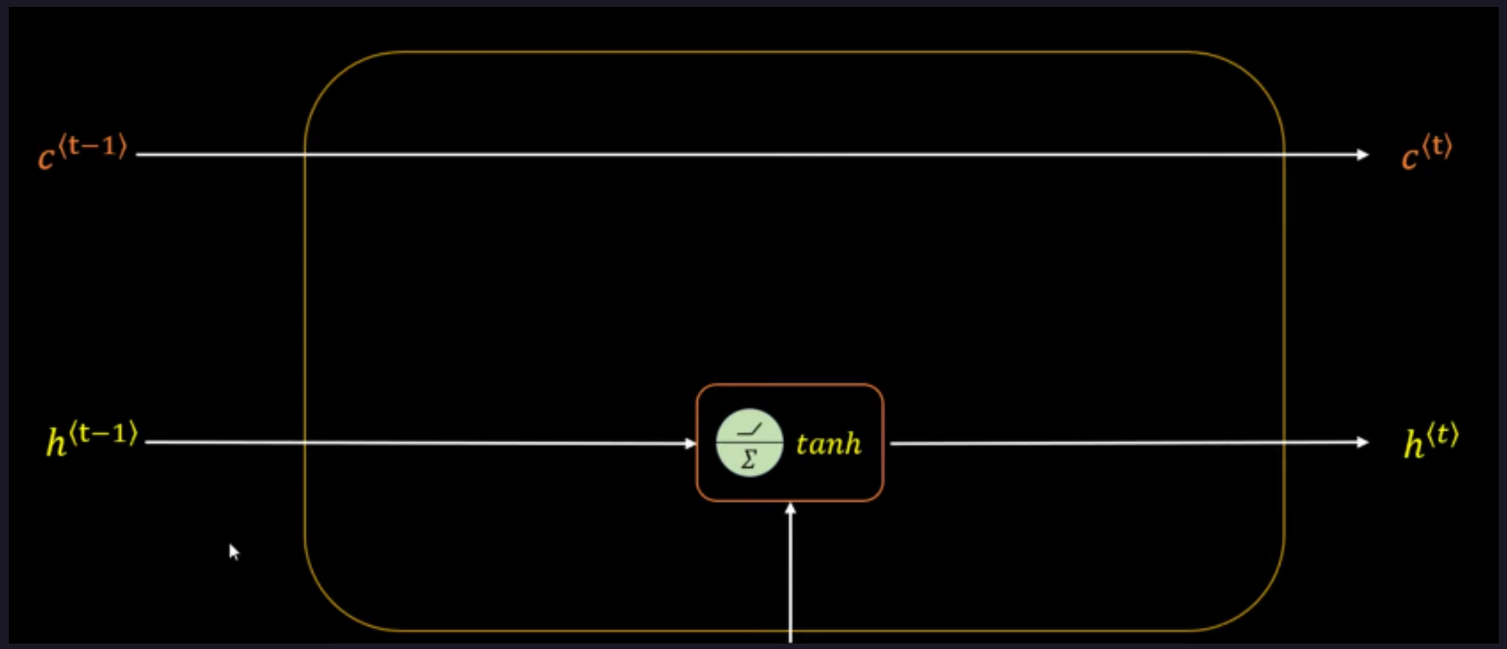
We seek to show that the LSTM Model can predict price patterns more efficiently than other technical indicators like 1 Year or 2 Year Moving Averages and the Buy and Hold methods of stock picking and recommend whether to buy or sell stocks based on the predicted movement of the stocks provided by the algorithm





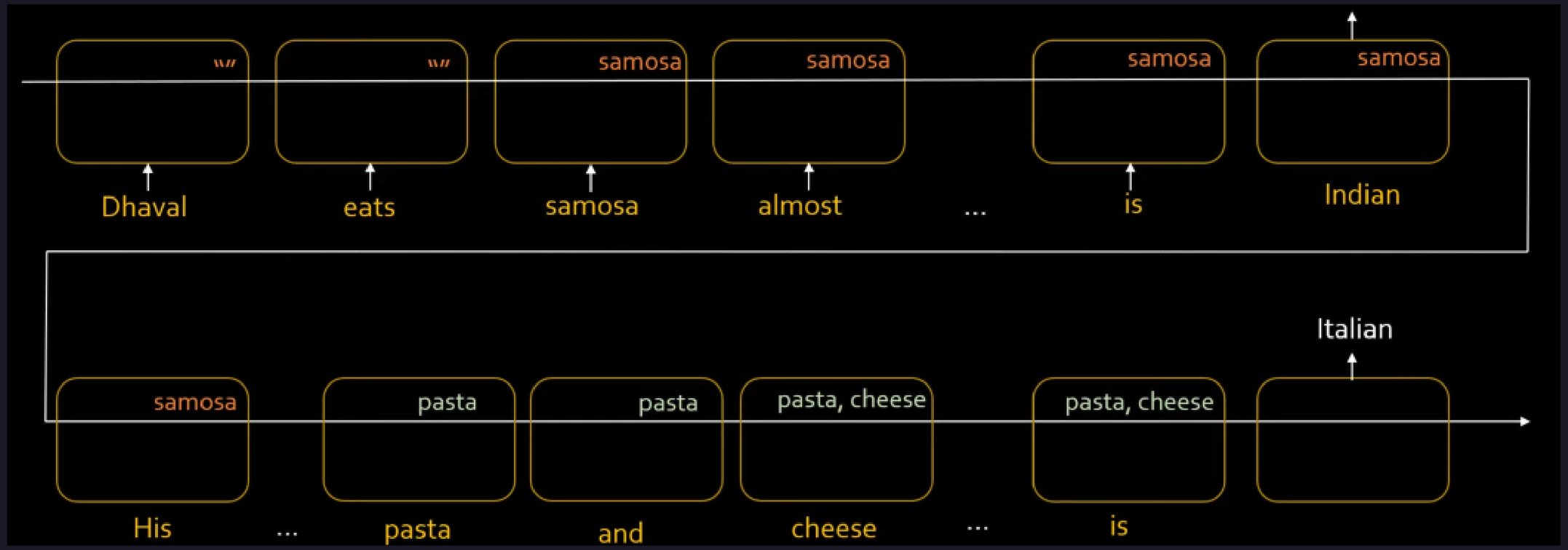
What is LSTM?

LSTM is a type of recurrent neural network but is better than traditional recurrent neural networks in terms of memory. Having a good hold over memorizing certain patterns LSTMs perform fairly better. As with every other NN, LSTM can have multiple hidden layers and as it passes through every layer, the relevant information is kept and all the irrelevant information gets discarded in every single cell.



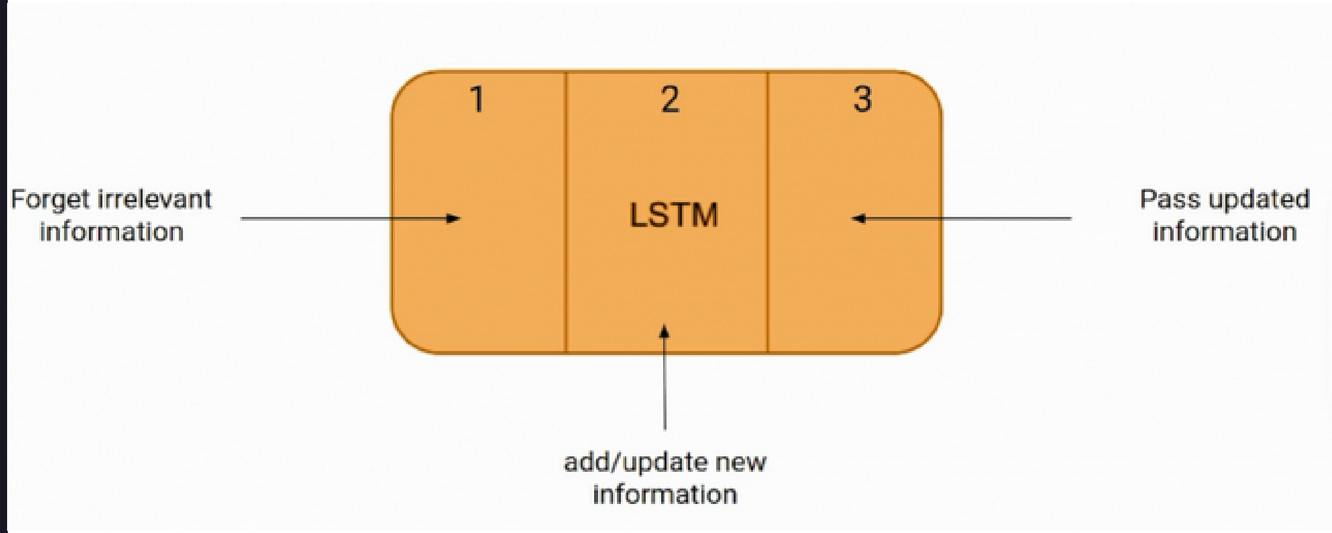
LONG TERM AND SHORT TERM VISUALISATION

Dhaval eats samosa almost everyday, it shouldn't be hard to guess that his favorite cuisine is Indian. His brother Bhavin however is a lover of pasta and cheese that means Bhavin's favorite cuisine is Italian



AN EXAMPLE OF HOW LSTM FUNCTIONS

THE LSTM CONSISTS OF THREE PARTS, AS SHOWN IN THE IMAGE BELOW AND EACH PART PERFORMS AN INDIVIDUAL FUNCTION.

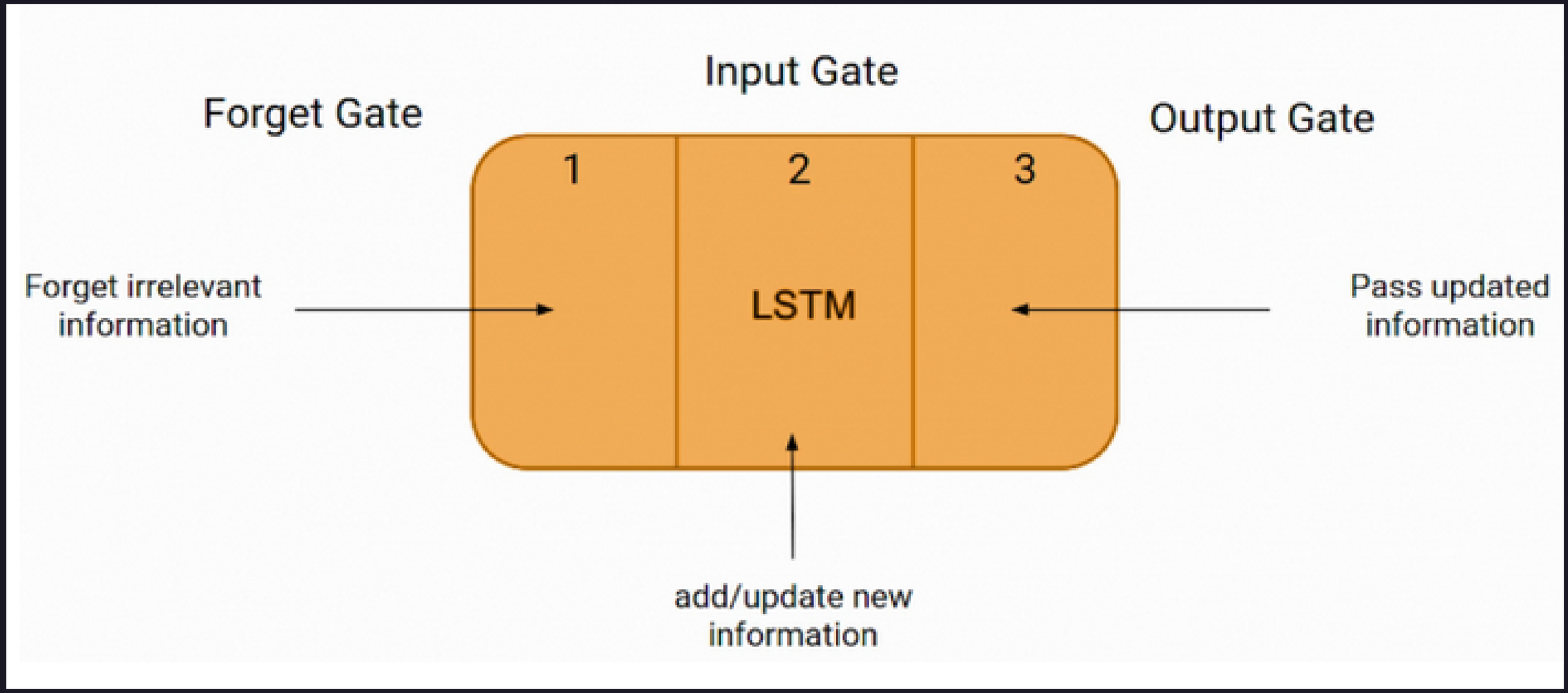


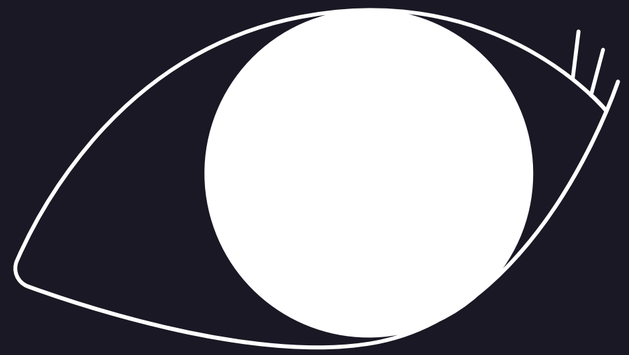
The first part chooses whether the information coming from the previous timestamp is to be remembered or is irrelevant and can be forgotten.

In the second part, the cell tries to learn new information from the input to this cell

At last, in the third part, the cell passes the updated information from the current timestamp to the next timestamp.

These three parts of an LSTM cell are known as gates. The first part is called Forget gate, the second part is known as the Input gate and the last one is the Output gate.


Input Gate
Forget Gate
Output Gate
1
2
3
Forget irrelevant information
LSTM
Pass updated information
add/update new information



CODE AND OUTPUT

Thank you.