RNN- Recurrent Neural Networks and LSTM - Long Short Term Memory

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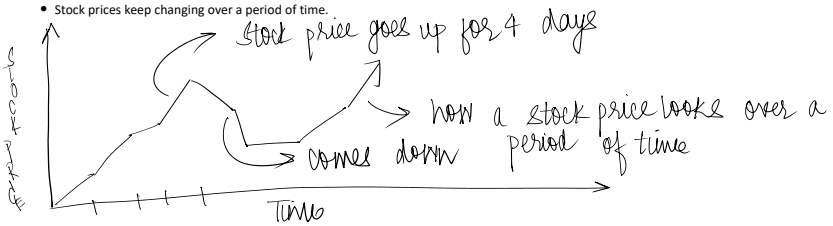
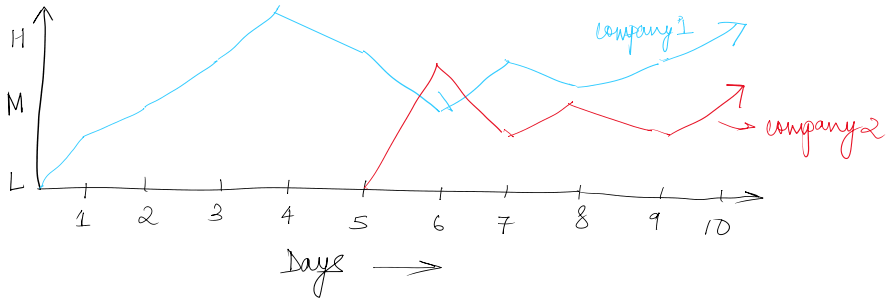
Remember: Although Basic, or Vanilla Neural Network is pretty good in terms of predictions but, they are usually thought of as stepping stones for fancier networks or complex techniques like LSTM and Transformers.

STOCK MARKET PROBLEM:

- Stock prices keep changing over a period of time.



- Longer a company trades on stock market, more data we have for it!
- For eg: Company 1 has 10 days of data and company 2 has 5 days of data!



- More time points => if we want to build a NN to work on such complex and varying data we need to work on different amounts of sequential data.
- Suppose we want to predict the stick price for the above companies for DAY10, we have following data
  - 9 POINTS FOR BLUE
  - 4 POINTS FOR RED
- **REQUIREMENT:** We need NN to be flexible in terms of how much sequential data we use to make predictions.

Differences and Similarities between NN and RNN:

In NN:

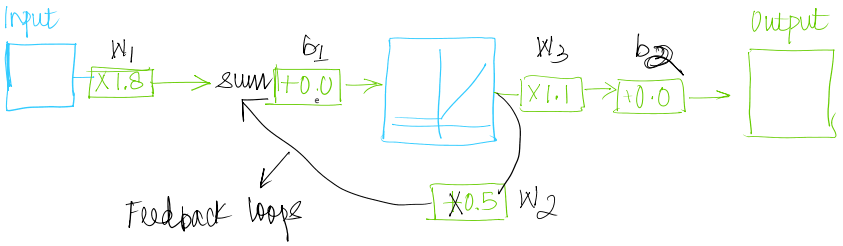
- 1 input, not more not less.
- 2 inputs, not more, not less.

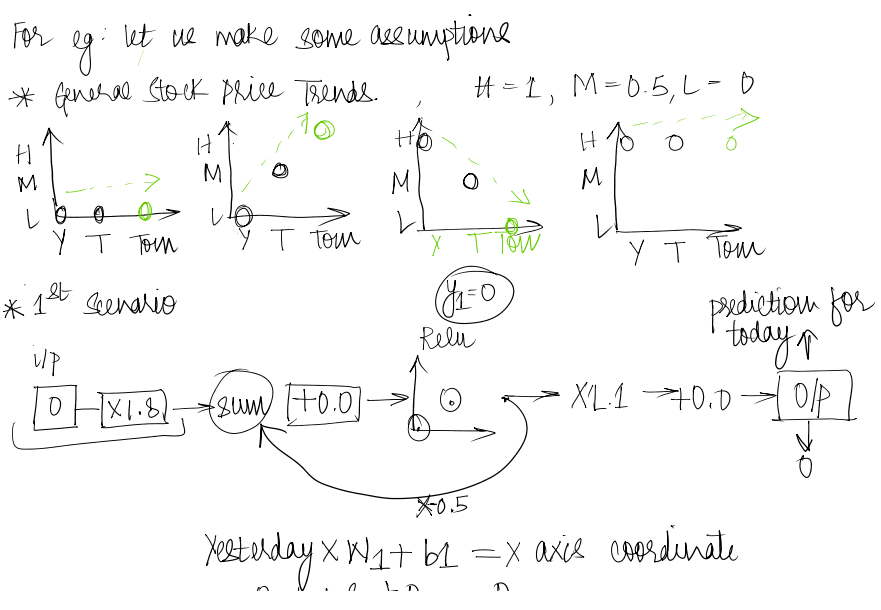
Similarities:

- Weights
- Biases
- Activation Function

Differences:

- Feedback Loop: Helps in dealing with varied amount of sequential Data





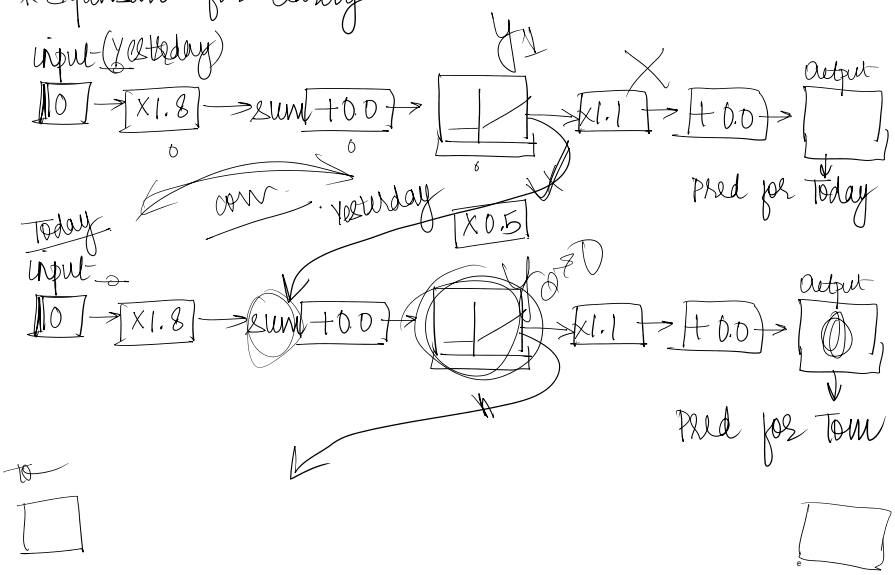
~~X0.5~~

Yesterday × W_1 + b_1 = X axis coordinate

0 × 1.8 + 0 = 0

f(0) = max(0, 0) = 0 → y axis coordinate

* Expansion for clarity



(Today × W_1) + (y_1 × W_2)

(0 × 1.8) + (0 × −0.5)

0 + 0