MACHINE LEARNING ALGORITHM FOR STOCK VALUE PREDICTION

Final Project
CS584 - Machine Learning

Julen Ferro (A20512110) & Eneko Gonzalez (A20520157)


Disclaimer: This presentation does not encourage investment in financial assets.


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1. INTRODUCTION

1. 1. Team members

Julen Ferro Bañales
Industrial Electrical Engineer
Data Science at IIT

Eneko Gonzalez
Telecommunications Engineer
Computer Science at IIT

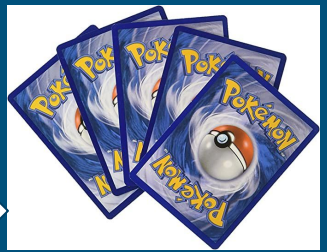
1. INTRODUCTION

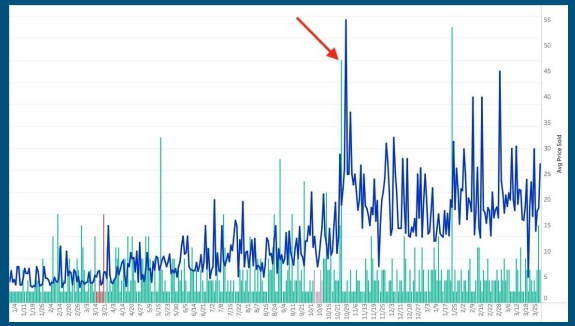
1. 2. Description of the problem

Pokemon Investing

1. INTRODUCTION

1. 2. Description of the problem





1. INTRODUCTION

1. 3. Project Proposal

I need a tool for predicting the stock evolution…

I need to ask students from the best engineering institute to develop it…

2. Description Of The Dataset

2. 1. Selected Dataset

Apple Stock Price from 1980-2021

Date	Open	High	Low	Close	Adj Close	Volume
1980-12-12	0.128348	0.128906	0.128348	0.128348	0.100178	469033600
1980-12-15	0.12221	0.12221	0.121652	0.121652	0.094952	175884800
1980-12-16	0.113281	0.113281	0.112723	0.112723	0.087983	105728000
1980-12-17	0.115513	0.116071	0.115513	0.115513	0.09016	86441600
1980-12-18	0.118862	0.11942	0.118862	0.118862	0.092774	73449600
1980-12-19	0.126116	0.126674	0.126116	0.126116	0.098436	48630400
1980-12-22	0.132254	0.132813	0.132254	0.132254	0.103227	37363200
1980-12-23	0.137835	0.138393	0.137835	0.137835	0.107583	46950400
1980-12-24	0.145089	0.145647	0.145089	0.145089	0.113245	48003200
1980-12-26	0.158482	0.15904	0.158482	0.158482	0.123699	55574400

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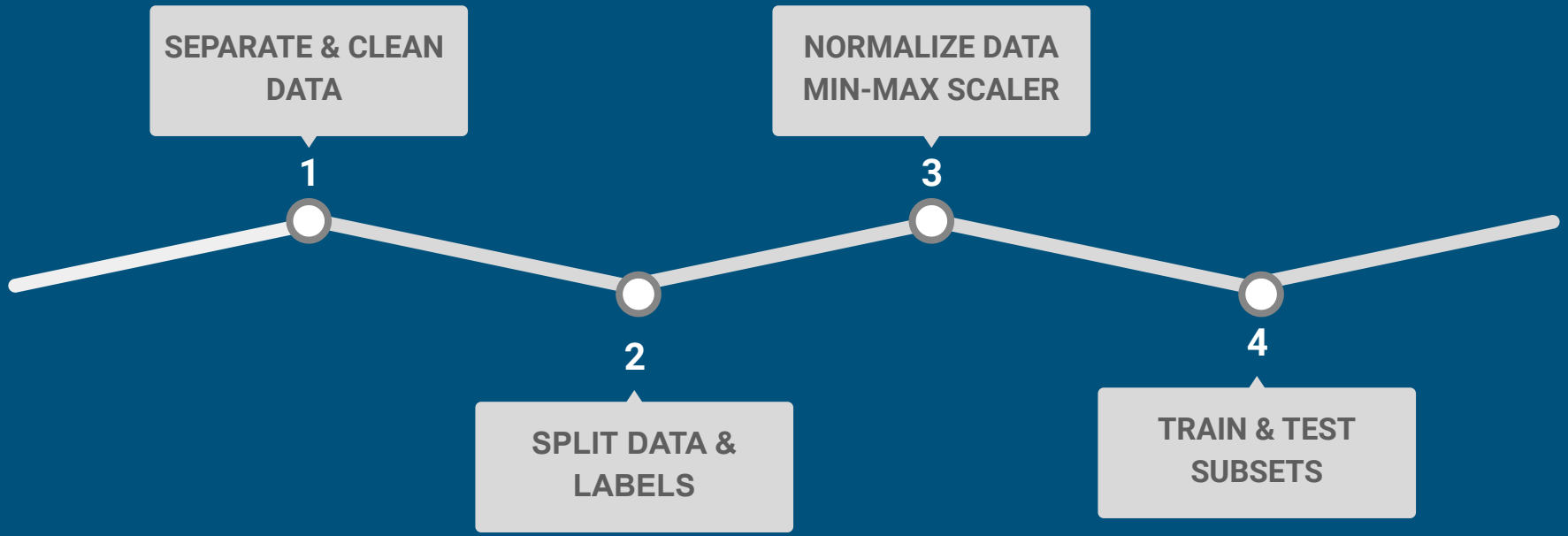
2. Description Of The Dataset

2. 2. Data preparation



3. Algorithm Comparison

3. 1. Simple Moving Average (SMA)

$$SMA = \frac{A_1 + A_2 + ... + A_n}{n}$$

SMA → Window Size = 50

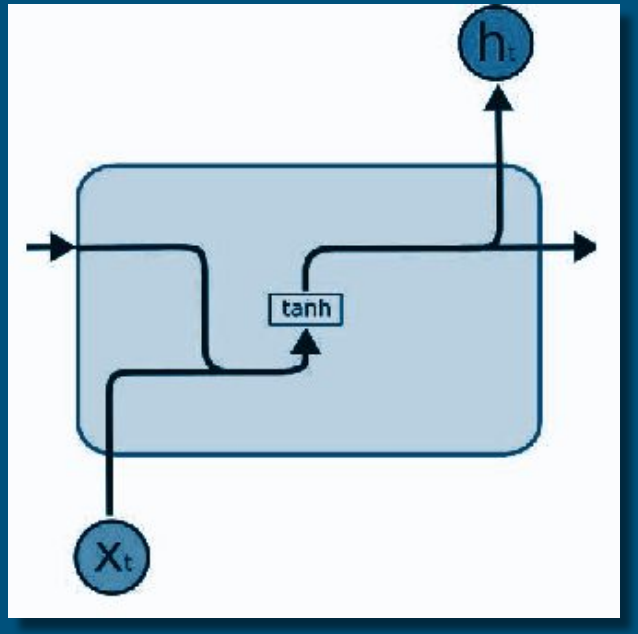
SMA → Window Size = 300

No ML in here → ML will give us accuracy

3. Algorithm Comparison

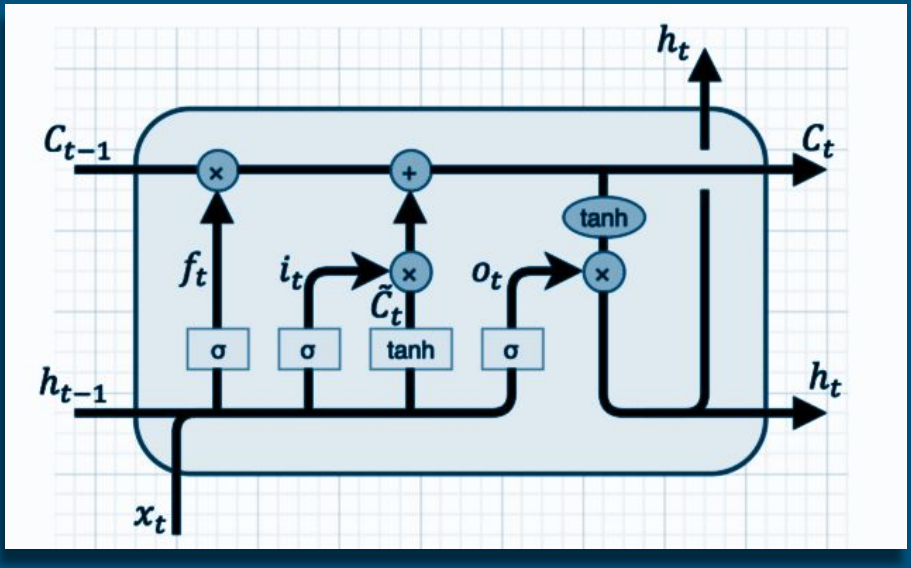
3. 2. Simple Recurrent Neural Networks

- Stock Data values are not independent.
- RNN use sequential data or time series data.
- Not actual use of memory
- Different levels of complexity



3. Algorithm Comparison

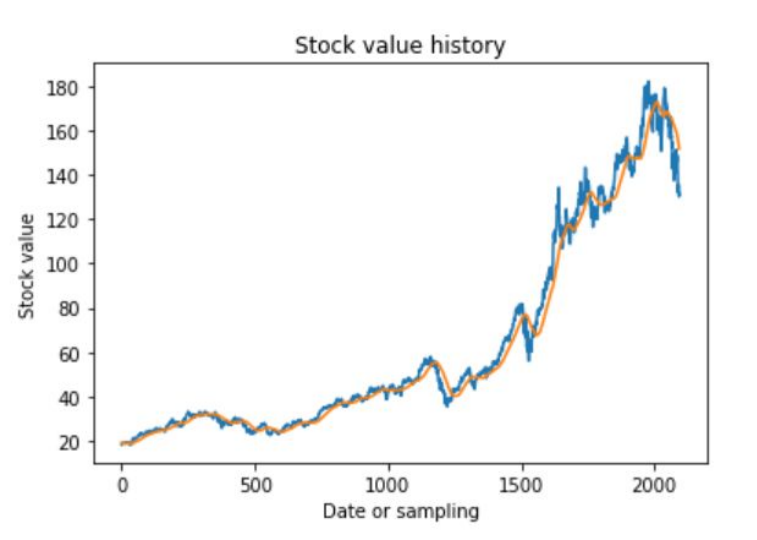
3. 3. Long Short Term Memory Recurrent Neural Network

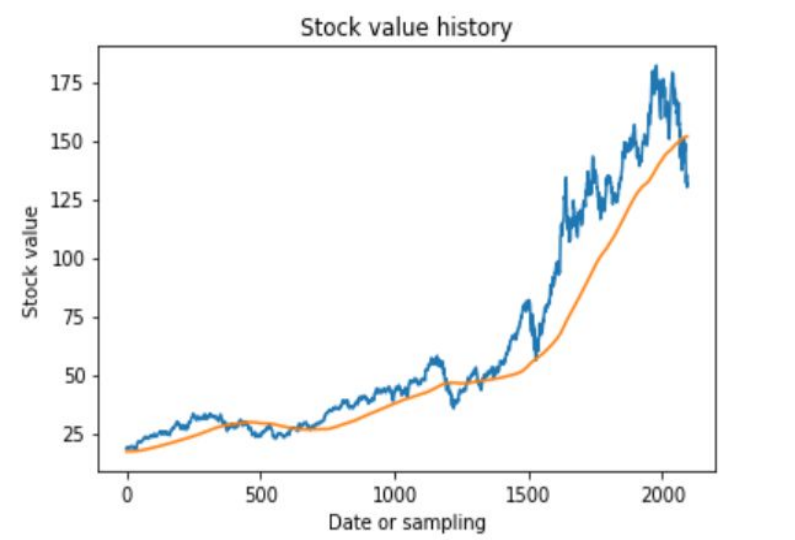


- Introduction of gates
- More flexibility
- More control
- Better results

4. Analysis Of Results

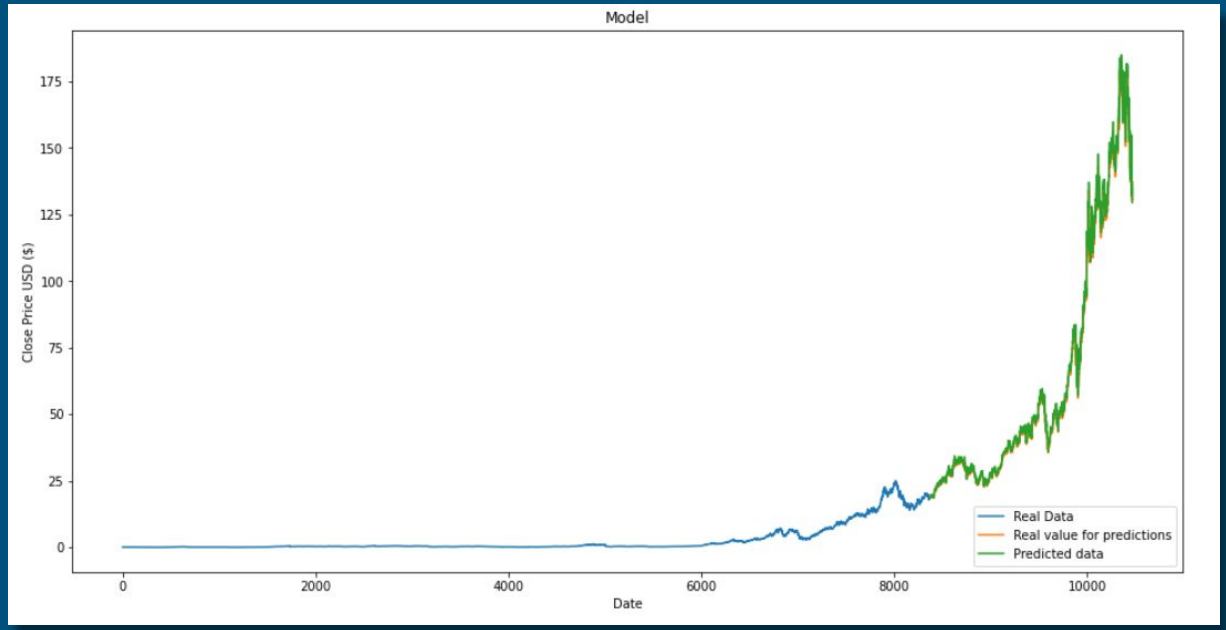
4. 1. Simple Moving Average (SMA)





4. Analysis Of Results

4. 2. Simple Recurrent Neural Networks



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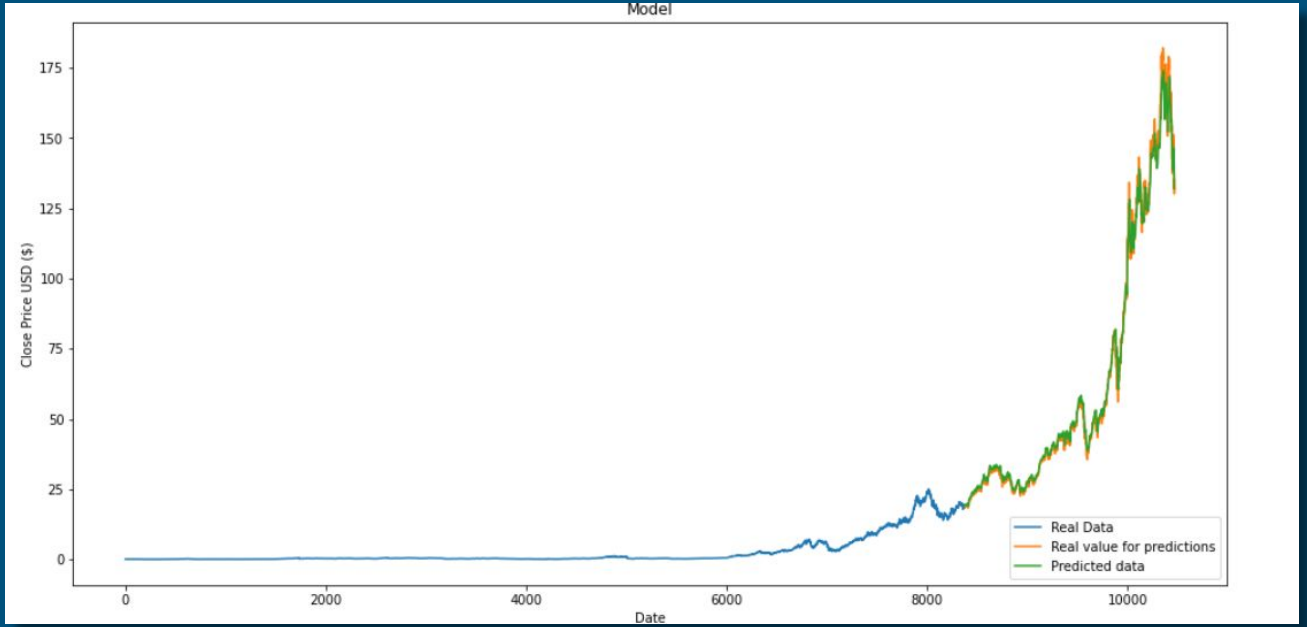
4. 3. Long Short Term Memory Recurrent Neural Network



4. Analysis Of Results

4. 4. Comparison Table

MODEL	SMA (WS = 50)	SMA (WS = 300)	RNN - Simple	RNN - LSTM
Training error	5.8 %	16.2 %	0.001%	0.0001%
Testing error	–	–	1.18%	0.01%
Computing time	0.1 s	0.5	1 s 5 ms	1 s 10 ms

5. Conclusions

1. SMA Model is the worst one
2. Window size of SMA
3. Importance of Machine Learning
4. RNN-LSTM potential

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