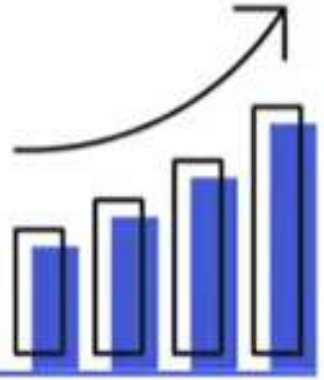
Data Science
Project

Predicting Ethereum Prices with LSTMs



Learning Outcomes:

In this project we will:

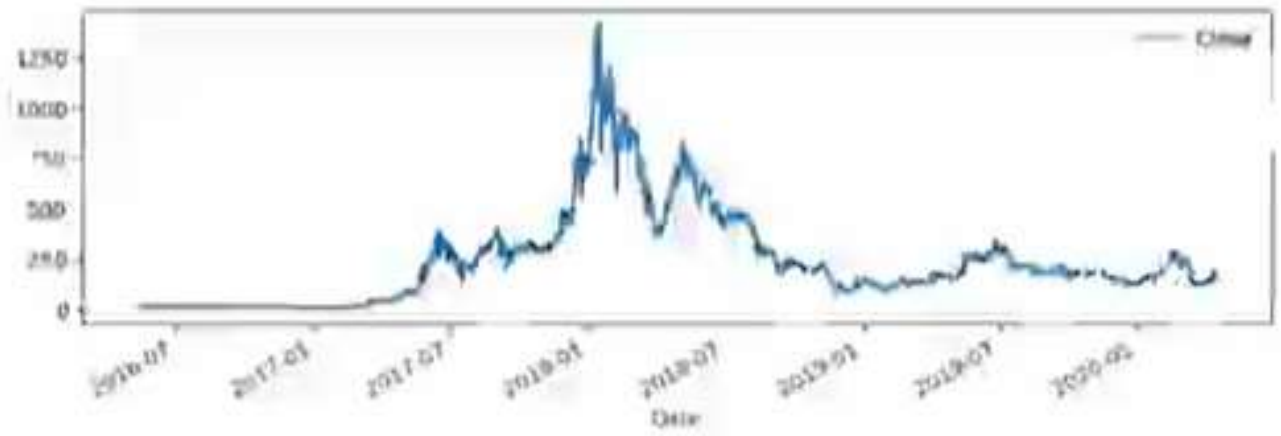
- Learn and understand about a specific class of time series data: Cryptocurrency
- Analyze trends in prices and accordingly build training data
- Learn about Recurrent Neural Networks and Long Short-Term Memory
- Deploy our model as a Flask webapp

Part I: Cryptocurrency

- With the recent boom in blockchain technology and digital currency, cryptocurrencies have gained a lot of traction, and investors!
- It has essentially become a variant of stock market trading, making it a variable data scientist can analyse and predict.
- As crypto is more unreliable and unstable, there has been an increasing demand in services and tools to help in crypto investing, compared to traditional stock market analysis.
- In this project, we are going to employ LSTMs, a form of RNNs, to atleast help us understand trends in crypto , *if not make us billionaires!*

Part I (i): Ethereum

- Ethereum is a decentralized blockchain with smart contract functionality. Ether (is the native cryptocurrency of the platform. Among cryptocurrencies, ether is second only to bitcoin in market capitalization. It is open-source software.
- Below we can see the chart for Ethereum close prices (taken from the dataset itself)
- Lets head on to the notebook for further analysis

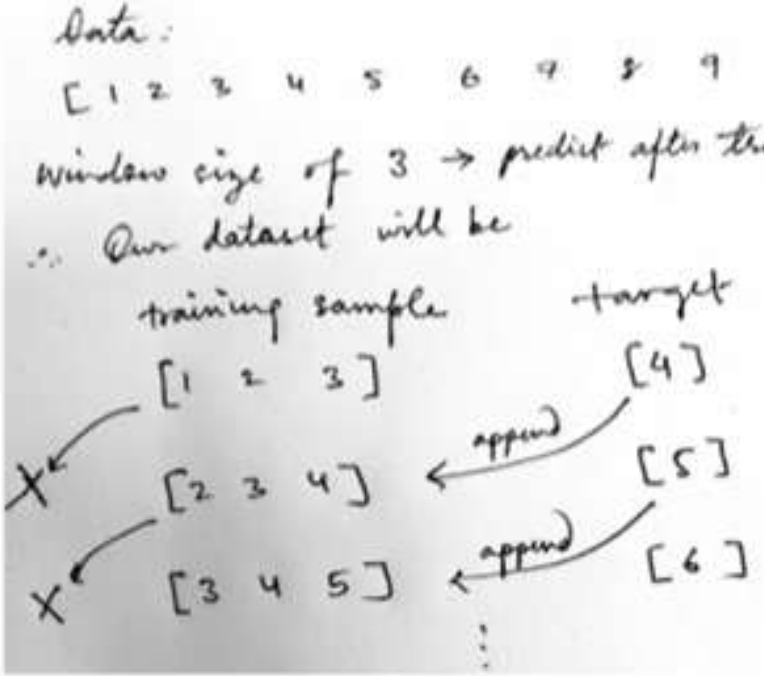


Part I (ii): The Dataset

- Link: https://www.kaggle.com/datasets/prasoonkottarathil/ethereum-historical-dataset
- This dataset has hourly entries of data from 2016-05-09 13:00:00 to 2020-04-16 00:00:00
- The task at hand: Predicting the Close Prices based on previous prices.
- Let us explore the different features in the dataset and try to understand how we can proceed with model building.

Part II (iii): Predicting Future Unseen Values

Rolling Window data generation:

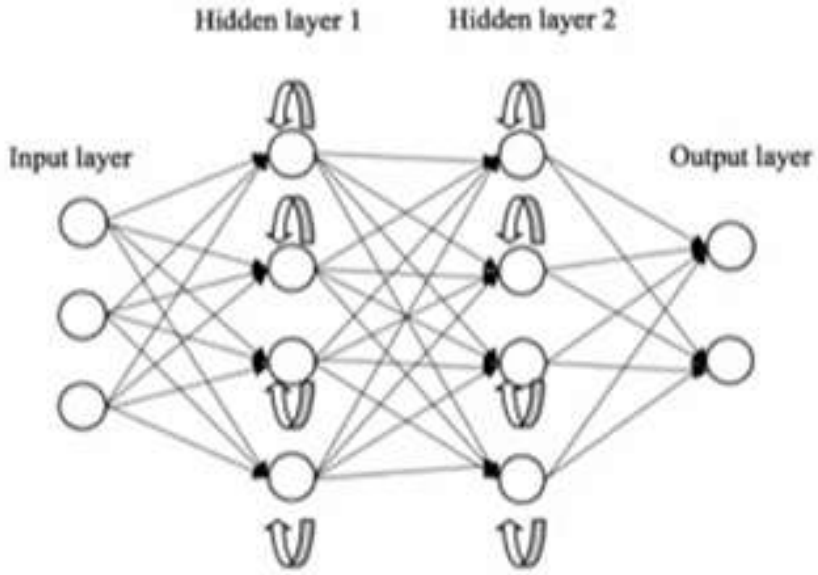


Part II (i): Recurrent Neural Networks

- The basic idea behind an RNN is memory. Regular Neural Networks like Feed Forward or CNNs consider each sample data independent of other data in the dataset.

- This is why RNNs are very useful for NLP and temporal problems as it considers past data to influence its predictions.

- Variants of RNN include:
  - Bi-directional RNNs
  - ***LSTMs***
  - Gated Recurrent Units

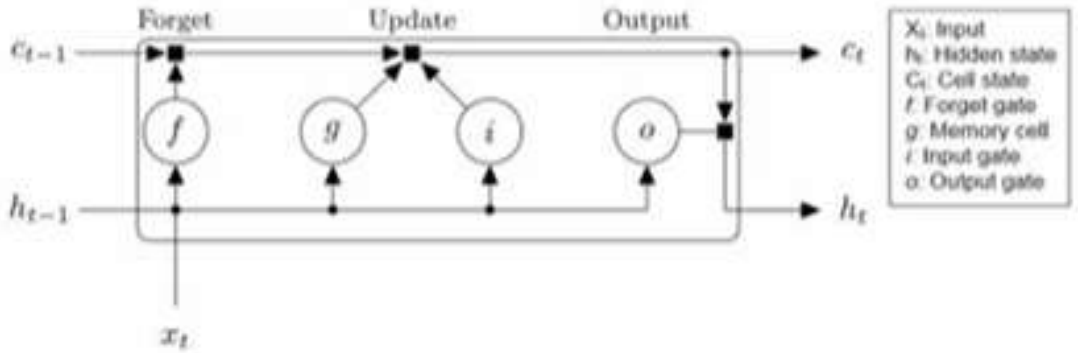


General Form of RNNs

Image source: https://towardsdatascience.com/understanding-the-mechanism-and-types-of-recurring-neural-networks/

Part II (ii): LSTMs and its implementation

- As RNNs usually fail to predict long term trends in a temporal data, Long Short-Term Memory NNs were designed to correct this problem.
- It comprises of 3 gates, namely input, output and forget gates which help it store useful data over a long range.
- We will be implementing LSTMs using the Keras library



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