***Libraries to use:***

Sklearn / keras/ math / numpy / panda/ tensorflow / …

For real-time data, we need requests and JSON.

***Data ( Old dataset ):***

In this paper, they got the data from <https://coinmarketcap.com/currencies/ethereum/historical-data/>

I just found an alternative dataset → <https://www.investing.com/crypto/ethereum/historical-data>

***Data ( real-time data):***

Create API key on crypto compare: <https://www.cryptocompare.com/cryptopian/api-keys>

and using the following source code.

<https://towardsdatascience.com/cryptocurrency-price-prediction-using-deep-learning-70cfca50dd3a>

***News Dataset:***

In this notebook, the author used the news thing he divided the daily news into top 25 news, and he categorized them into positive, negative, and neutral. Then he checked if the news had an impact on the prices, and divided the impact into three categories as well. He used XGboost with a high prediction value.

Refer to this notebook: [Stock Price Prediction - 94% XGBoost](https://www.kaggle.com/shreyams/stock-price-prediction-94-xgboost/notebook)

***References:***

We have 2 great references, both used LSTM and the prediction result is somehow amazing:

<https://pirimidtech.com/predicting-cryptocurrency-prices-using-ai-ml/>

The author in this notebook used simple LSTM and trained the data on a small dataset, we can improve the model by using an advanced LSTM ( bidirectional LSTM ) and train the model on a larger dataset. ( 2017 - 2021 ) it would take too much time, but it would be better for our model. Also, we can perform hyper tuning parameters to get the most optimized performance by the LSTM model.

And the other one is: <https://towardsdatascience.com/cryptocurrency-price-prediction-using-deep-learning-70cfca50dd3a>

Reference #2: It’s an article, they used LSTM as well: <https://www.mdpi.com/2079-9292/10/3/287/htm>

Reference #3: Notebook from Kaggle, he predicted the bitcoin price using another model than LSTM which is ARIMA.  
Refer to Kaggle: <https://www.kaggle.com/myonin/bitcoin-price-prediction-by-arima>

***Determinant Paper:***

[41 determinants](https://www-sciencedirect-com.ezproxy.aub.edu.lb/science/article/pii/S1544612320304864): Researchers found that different factors may impact the price of the bitcoin.

We have 3 datasets: BTC and ETH price/ Determinants / News

| Close | Open | Low | High | Volume |
| --- | --- | --- | --- | --- |

→ Accuracy: 60%

LSTM

Determinants → Catboost/ XGBoost …

**Output: Negative - Positive - Neutral - objective - Subjective**

→ Dataset: Prices will be updated

| Close | Open | Low | High | Volume | Negative | Positive | Neutral | Objective | Subjective |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

→ Accuracy 70%

Historical Data (BTC)

Historical Data ( Determinants) → XGboost → **Output: Negative - Positive - Neutral - objective - Subjective**

Then I add the Outputs to the BTC Historical Data → LSTM (TRAINING)

DETERMINANTS:

DANY: 1-2-3-7-8-10-15-37

HIBA: 16-17-19-20-23-24-25

HAMZA: 18-21-22-26-38-39-40

We can add some determinants from this website: <https://www.blockchain.com/charts>   
Everything related to mining and BTC market info is found on this website and can be downloaded as a CSV file.

1. Average Hashrate (1)  
   The best bitcoin mining pool is **f2pool** in China, where it mines 19% of total blocks.   
   To get the info: [**https://siastats.info/pools/F2pool**](https://siastats.info/pools/F2pool)
2. Bitcoin market Cap (2)  
   Bitcoin market Cap 2013- 2021:<https://www.statista.com/statistics/377382/bitcoin-market-capitalization/#:~:text=Bitcoin%20(BTC)%20market%20capitalization%20as%20of%20February%2022%2C%202021&text=In%20January%202021%2C%20the%20Bitcoin,than%20600%20billion%20U.S.%20dollars>.
3. Bitcoin trading volume & Market Cap(2-3)   
   <https://coinmarketcap.com/currencies/bitcoin/historical-data/>
4. Mining difficulty (8)
5. Volume of blocks (10)
6. Bitcoin Mining profitability (15)
7. FTSE 100 index (37)
8. S&P 500 Index