Crypto Prophet: Investing Intelligently

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INTRODUCTION

- Cryptocurrency had a recent appearance only around a couple of decades ago, making it a novel topic. This means that while data research has already been done on the subject, there is a limited scope of said research. Most of the work done today is focused on predicting the prices of cryptocurrencies.
- **We aim to identify correlations, trends, and market volatility to help make informed investment decisions.**

DATA

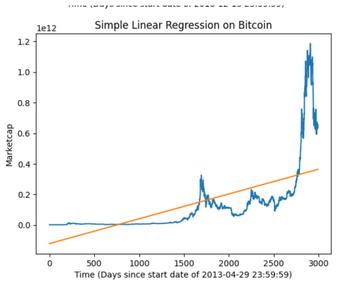
We used "Cryptocurrency Historical Prices" from the Kaggle community for this analysis.
Sample of the data –

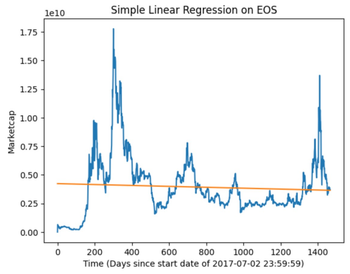
Name	Symbol	Date	High	Low	Open	Close	Volume	MarketCap
Ethereum	ETH	8/8/15	2.79881	0.71472	2.79376	0.753324	674188	45486894.2

METHODOLOGY

Volatility

- The volatility of cryptocurrencies makes investments very risky.





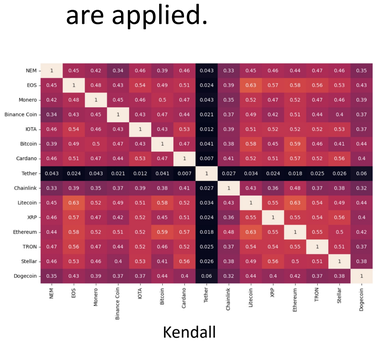
- Simple Linear Regression is applied to Market Capital over time to calculate the Sum of Squared Errors.
- This gives us a ranking of how volatile a cryptocurrency is.

Symbol	Volatility (SSE)
Aave	4.927684116452311e+20
Monero	3.698677827000237e+21
Dogecoin	1.6124637551556124e+23
Bitcoin	7.426109654380517e+25

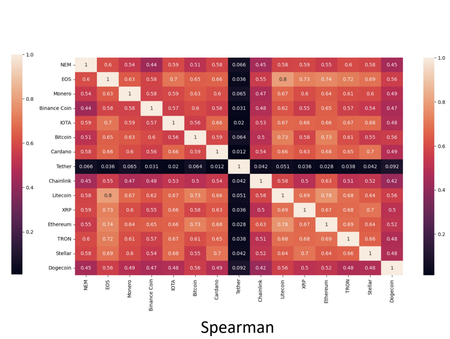
- The SSE is a full measure of each point's error margin from the line of ideality.

Correlation Analysis

- Identifying the correlations among the various cryptocurrencies can be vital information in making an informed investment decision.
- The price change is computed as Opening – Closing price upon which Kendall and Spearman correlation techniques are applied.



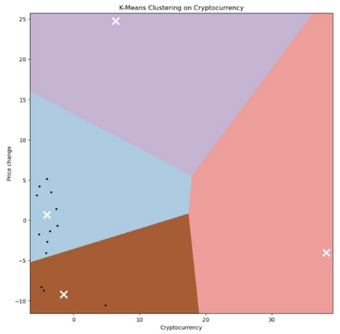
Kendall



Spearman

Clustering

- Principal Component Analysis (PCA) is used to reduce the dimension of the data and identify most important features.
- Based on elbow technique analysis, k-Means clustering is applied with the number of clusters as four.



labels	Cryptocurrencies
0	EOS
0	Monero
0	Binance Coin
0	IOTA
0	Bitcoin
0	Cardano
0	Chainlink
0	Litecoin
0	Ethereum
0	TRON
1	Tether
2	Dogecoin
3	NEM
3	XRP
3	Stellar

Price Trend Analysis

Regression for Predicting Prices

- Implemented various types of regression models and compared the predicted values of the models.
- Out of all the models, Multiple Linear Regression predicted the prices accurately.

Date	Name	Actual Price (Close)	Predicted Price (Close)
2/26/18	BNB	9.902319908	9.659516630
2/27/18	BNB	10.65989971	10.57823017
2/28/18	BNB	10.4382	10.4445
8/11/15	ETH	1.067860007	1.074743575
8/12/15	ETH	1.217440009	1.123380840
8/13/15	ETH	1.827669978	1.812181718

Forecasting for Future Price

- Time series forecasting model to analyze historical price data of cryptocurrencies and predict prices for the next week.

Date	Symbol	Forecasted Price (Close)
07/07/2021	BNB	34310.74397
07/08/2021	BNB	34243.5706
07/09/2021	BNB	34108.7434
07/10/2021	BNB	34090.2437

CONCLUSION

- We have successfully used correlation analysis, clustering, regression, and visualization concepts to address complex cryptocurrency behaviors and make accurate price predictions for a future week.
- Using our proposed methodology, an investor can strategize based on the outputs of the methods and can create a diversified portfolio that can help maximize profits from this highly volatile form of currency.