

CRYPTO- CHRONOS

By Saamir Shamsie





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What is Crypto-Chronos?

02 METHODOLOGY

The ideology behind our work.

03 DIVING DEEPER

How we do what we do.

04 BACK-TESTING

How well we do what we do.

05 RECOMMENDATIONS

Room for improvement.

06 THANK YOU!

Questions? Comments? Concerns?

INTRODUCTION 01: THE CRYPTO SPACE

As technological frontiers continue to expand, cryptocurrency and blockchain have emerged as the zeitgeist of innovation over the past five years. Catalyzed by increasing mainstream attention and endorsement by influential figures, these technologies have presented a double-edged sword, offering immense opportunities and accompanying challenges.

At the forefront of this revolution is **Bitcoin**, the world's first cryptocurrency, shrouded in mystery and intrigue. Developed under the pseudonym Satoshi Nakamoto since 2001, Bitcoin officially debuted in January 2009. After reaching a record high of \$65,000 in November 2021, it's currently valued at around \$29,000.

Yet, Bitcoin is but the tip of the iceberg in a sea teeming with over 1.8 million unique cryptocurrencies. Despite this vast multitude, the market is dominated by a handful of heavyweights like Ethereum, BNB, and XRP contributing to a staggering total market capitalization of \$1.18 trillion.

This fast-paced, pulsating realm of cryptocurrencies, while thrilling, is marked by considerable volatility, largely driven by surges in public interest. The road ahead in this crypto landscape promises to be nothing short of a thrilling roller coaster ride.

Cryptos: 1.8M+ Exchanges: 652 Market Cap: \$1.18T ▲1.16% 24h Vol: \$39.69B ▲21.46% Dominance: BTC: 48.6% ETH: 18.9%

INTRODUCTION 02: NOTABLE COINS



BITCOIN (BTC)

The original decentralized cryptocurrency, widely adopted as digital gold



CARDANO (ADA)

A proof-of-stake blockchain platform; enables decentralized applications.



BINANCE (BNB)

Native cryptocurrency for Binance exchange and ecosystem.



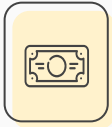
DOGE (DOGE)

Meme-inspired cryptocurrency, popular for tipping and donations.



POLKADOT (DOT)

Multi-chain platform, enabling different blockchains to interoperate.



ETHEREUM (ETH)

A platform for decentralized apps using smart contracts.



CHAINLINK (LINK)

Decentralized oracle network, provides external data to blockchains.



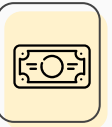
LITECOIN (LTC)

Silver to Bitcoin's gold, faster transaction confirmation



UNISWAP (UNI)

Native token of Uniswap, a decentralized exchange.

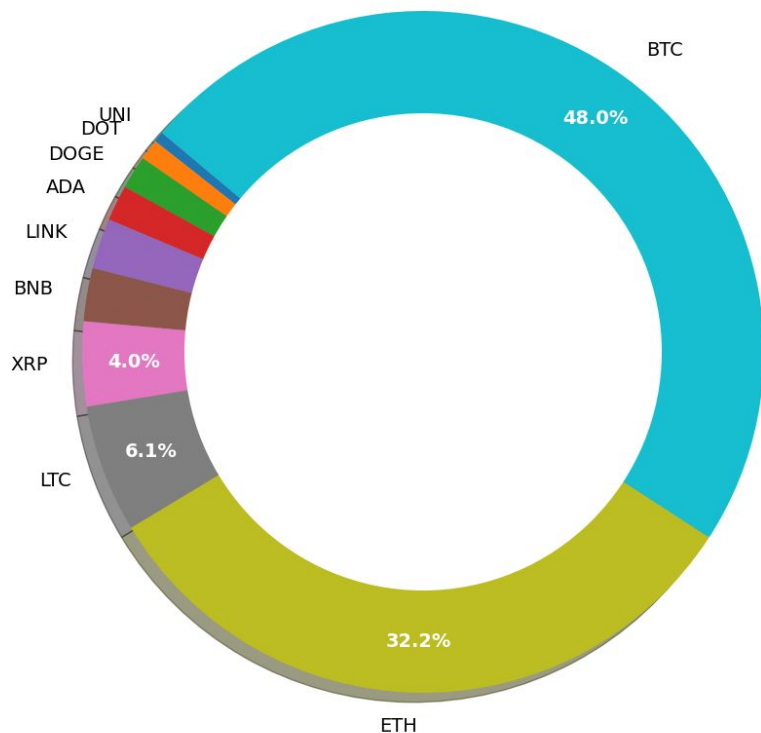


RIPPLE (XRP)

Real-time global payment protocol for institutional transfer.

INTRODUCTION 03 - MORE ABOUT COINS

Total Volume for Each Cryptocurrency



1. **Bitcoin (BTC):** Largest market cap; daily trading volume often in billions.
2. **Ethereum (ETH):** High market cap; volume reflects decentralized application activity.
3. **Binance Coin (BNB):** Significant market cap and volume due to Binance's ecosystem.
4. **Ripple (XRP):** High market cap and volume, reflecting global banking system usage.
5. **Litecoin (LTC):** Consistent market cap and volume due to widespread payment solution use.
6. **Chainlink (LINK):** High market cap for decentralized oracle networks, influencing volume.
7. **Cardano (ADA):** Rapidly growing market cap and volume due to innovative network upgrades.
8. **Polkadot (DOT):** Solid market cap, volume varies with ecosystem project development.
9. **Uniswap (UNI):** Market cap and volume reflective of the DeFi sector health.
10. **Dogecoin (DOGE):** Dramatic growth in market cap and volume due to public attention.

METHODOLOGY

Welcome to CryptoChronos, an advanced AI-driven trading algorithm tailored for crypto assets. This tool leverages AI to initiate trades on numerous cryptocurrencies, capitalizing on their lag time to 5% Bitcoin value increases. Aimed at optimizing trade executions and enhancing returns, CryptoChronos brings sophistication to trading, appealing to both seasoned and aspiring crypto traders.



METHODOLOGY 01: BEATING THE ODDS

In the tumultuous seas of the cryptocurrency market, amid the waves of volatility and stormy bouts of scams, it's easy to find oneself adrift. Many novice investors find themselves floundering, their portfolios dwindling, while the larger sharks navigate these waters with ease. However, take heart. We present to you our beacon in these murky waters: CryptoChronos.

CryptoChronos is not just an algorithm; it's our solution to the unpredictable winds of the crypto market. Powered by advanced artificial intelligence, it tilts the odds in our favor, harnessing the very volatility that's often seen as a foe.

We've observed that Bitcoin, the Goliath of crypto with its formidable market cap, isn't just a participant in the market—it's a pacesetter. It stirs the waters and shapes the market sentiment. We've fine-tuned CryptoChronos to read these ripples, to discern the ebbs and flows in Bitcoin's price action, and to predict whether other cryptocurrencies will fall in step. And if they do, we've trained it to anticipate the time it would take for them to mirror Bitcoin's price action.

In essence, CryptoChronos is our compass and our map in these vast, volatile oceans of crypto. With it, we're not just surviving; we're thriving.

METHODOLOGY 02: ON THE RIGHT TRACK

# Of Lags (hrs)	P-score
1	0.2562
2	0.2046
3	0.0054
4	0.001
45	0.0027
6	0.0028

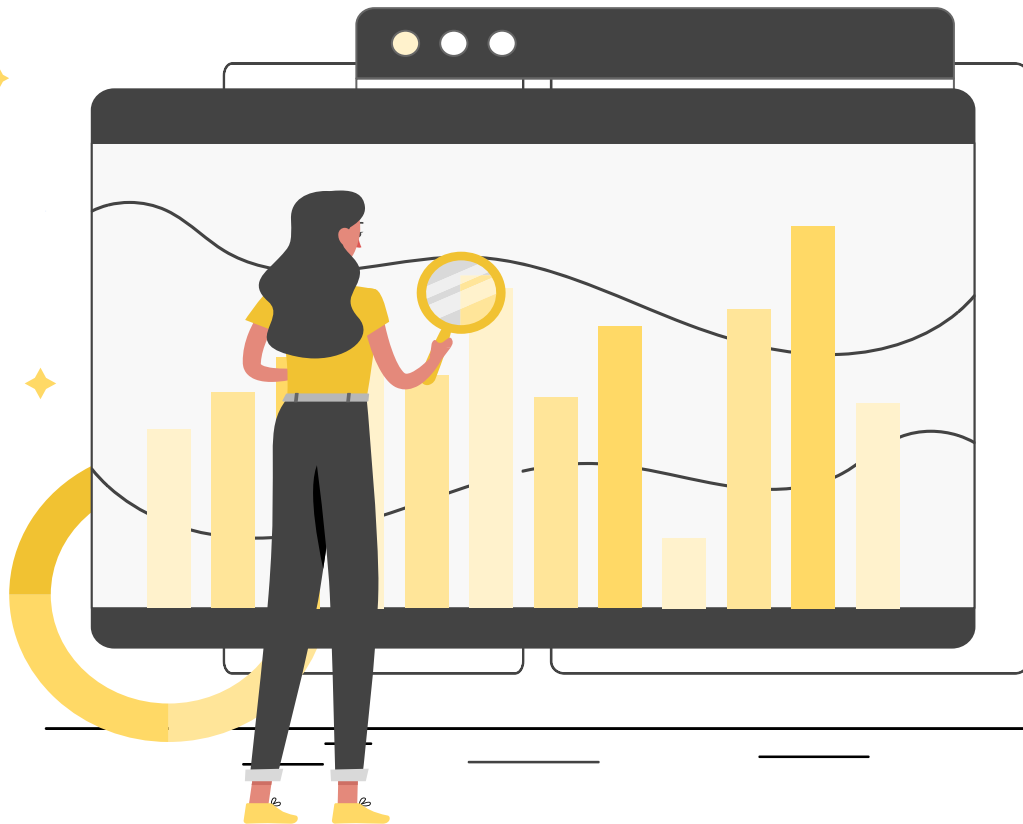
The Granger causality test, a cornerstone in econometrics, assesses if past values of one variable predict another. In the context of our project, multiple tests with varied lags (1 to 6) were performed. Pivotal interpretations include:

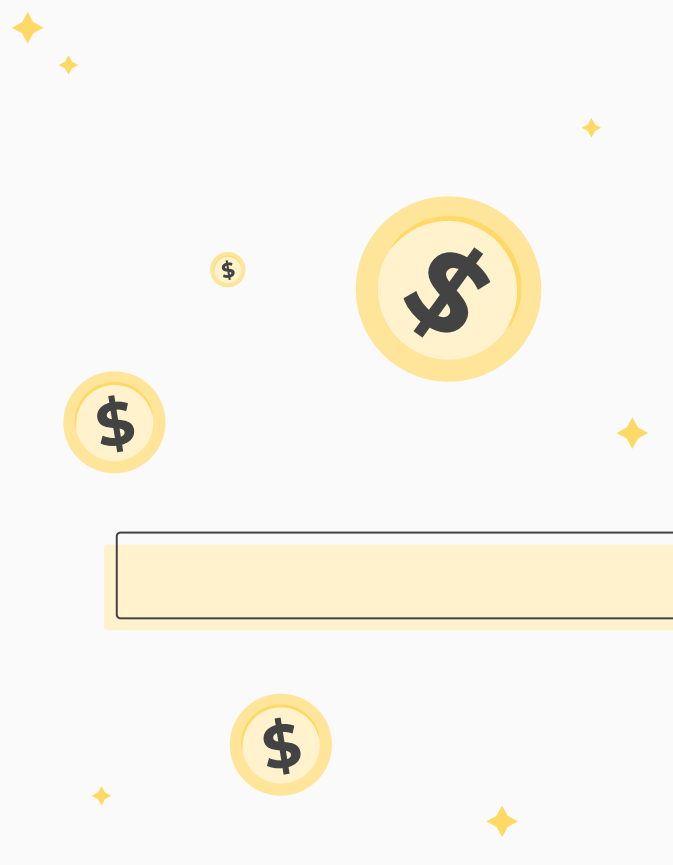
For lags 1 and 2, p-values exceeded 0.05, insinuating that Bitcoin's previous values aren't significantly predicting the other cryptos' performance.

Lags 3 to 6 presented p-values below 0.05, contradicting the prior findings. This suggests that, for these lags, past values of Bitcoin can significantly forecast the performance of other cryptos, hinting at a Granger causality.

In essence, these tests affirm that Bitcoin's price movement can potentially serve as a predictive factor for other cryptos' performance, depending on the lag considered. We leveraged these findings to develop our AI-powered trading algorithm, CryptoChronos.

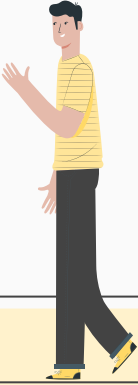
**DIVING
DEEPER**





"In the world of crypto trading, we're turning 'buy low, sell high' into 'buy before high, sell higher!'"

— SAAMIR, OUR SUPREME LEADER



DIVING DEEPER OI: THE DATA

COIN-GECKO API

As the backbone of our data collection process, we've used of Coin-Gecko, a prominent crypto exchange and trading platform. It offers an API that pulls historical data, giving data from 2016 till 2023

SQL DATABASE

To manage the approximately 60,000 rows of data per coin, we've opted for an SQL database. This choice led to the creation of 'crypto_database.db', a highly efficient and well-structured database.

SQL QUERY

Thanks to the SQL database, we can perform rapid and efficient data queries. This streamlined setup enables swift extractions and joins of tables and columns, serving as a crucial tool in our subsequent data analysis stages

DIVING DEEPER 02: PREPROCESSING

01 PERCENTAGE CHANGES

Firstly, we feature engineered percentage changes in price from 1 till 6 hours ago from the current time. This allows us to monitor price action of bitcoin with respect to other coins.

03 GRABBING WINDOWS OF DATA

We were then able to grab a 6 hour window of data after a BTC surge is realised. Our algorithm can now trade within these 6 hour windows.

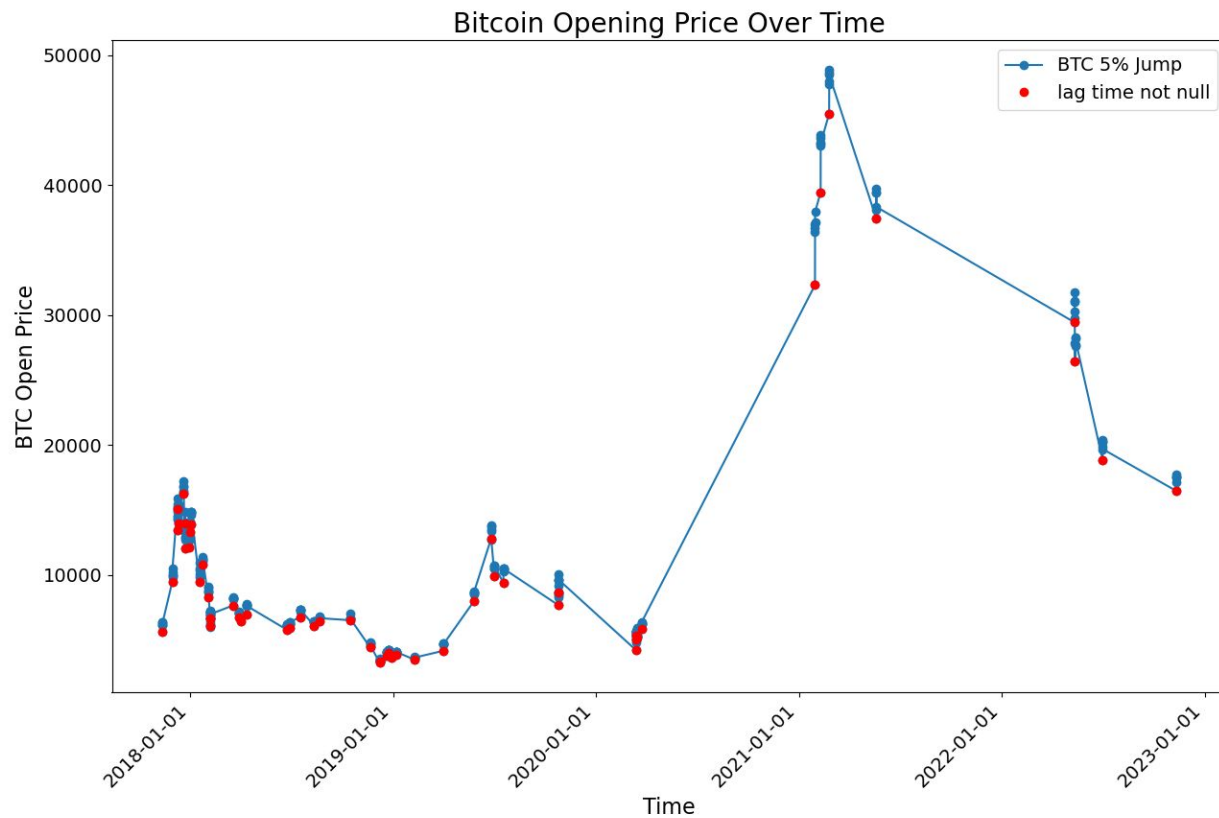
02 IDENTIFY BTC PRICE ACTION

Next, we filtered our data down to identify instances where Bitcoin's price surged by 5% on the 1 hour timeframe. We see these as significant price action which can influence the market.

04 FINDING LAG TIMES

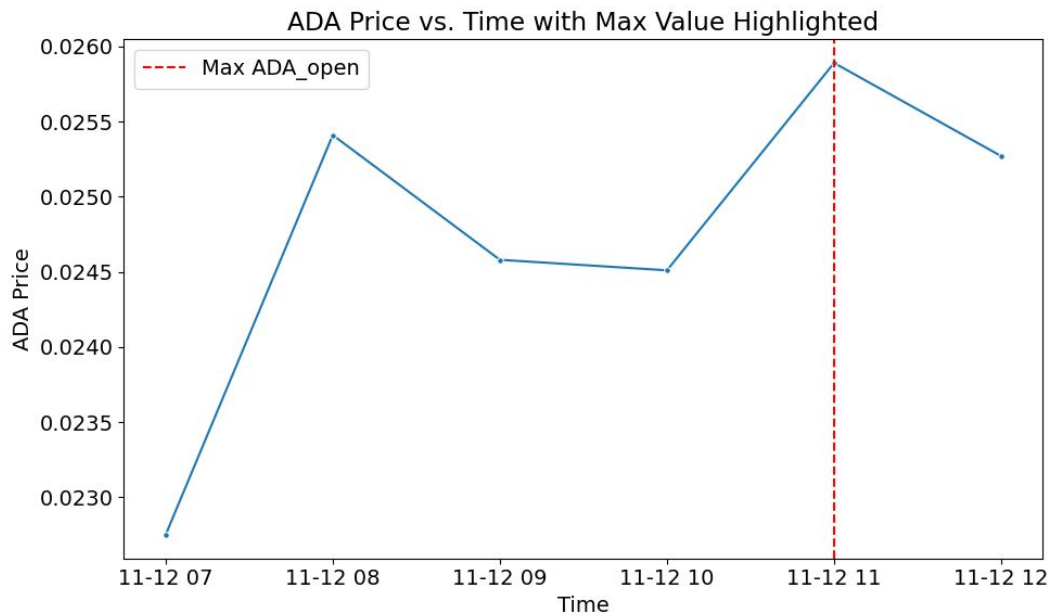
Lastly, we identified whether the BTC price surge is followed by a price surge in another coin within the window. Then, we calculated the time taken for another coin to reach its high within the window.

DIVING DEEPER 02: PREPROCESSING RESULTS



DIVING DEEPER 03: PREPROCESSING RESULTS

Time	BTC open	BTC close	ADA open	ADA close	BTC change 1hr	ADA change 1hr	ADA change 2hr	ADA change 3hr	Lag time	Met threshold
2017-11-12 7:00:00	5616.67	6138.88	0.02275	0.02541	9.296	11.692	4.182	0.993	0 days 04:00:00	1



DIVING DEEPER 04: MODELING

ADA Model Architecture

```
lag_model = Sequential([
    Dense(64, activation='relu',
input_shape=(features_train.shape
[1],),
kernel_regularizer=l2(0.001)),
    Dropout(0.3),
    Dense(64, activation='relu',
kernel_regularizer=l2(0.001)),
    Dropout(0.3),
    Dense(1)
])
```

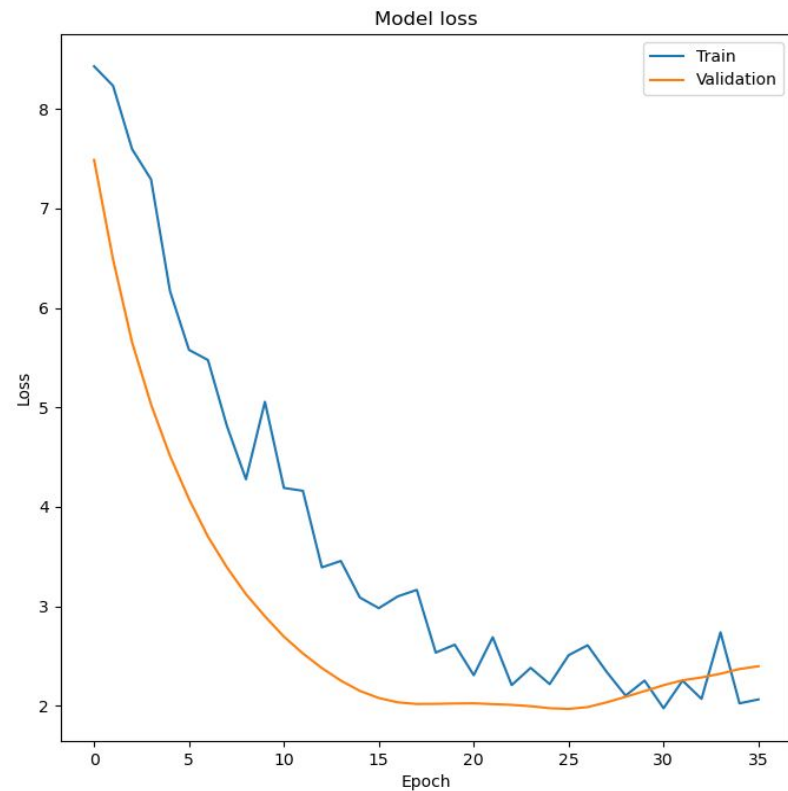
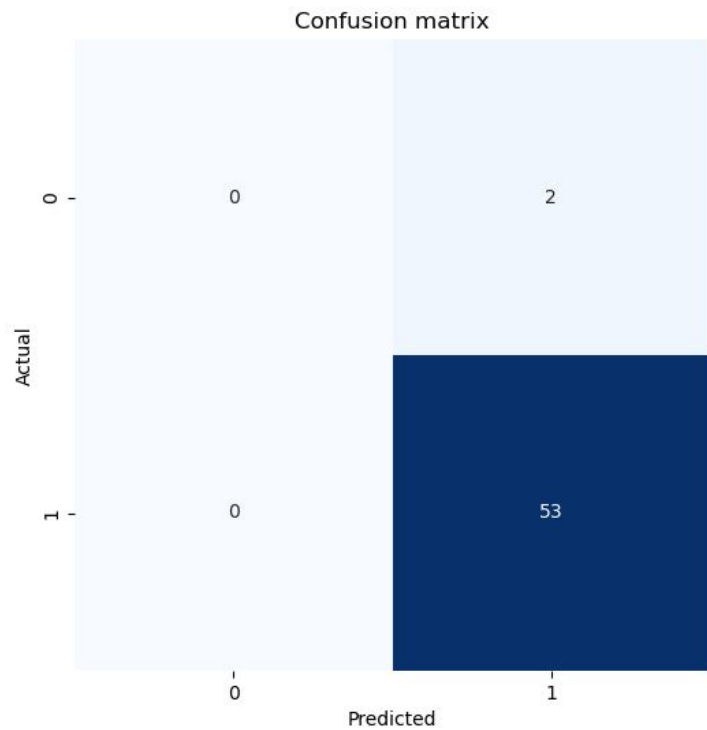
Challenges:

1. Aggregating data to one row per 6-hour window resulted in approximately 80 rows per coin, complicating analysis.
2. ARIMA models were unsuitable due to irregular and discontinuous time indexes.
3. Addressing the imbalanced class distribution (94%) in the 'met_threshold' target column posed a classification challenge

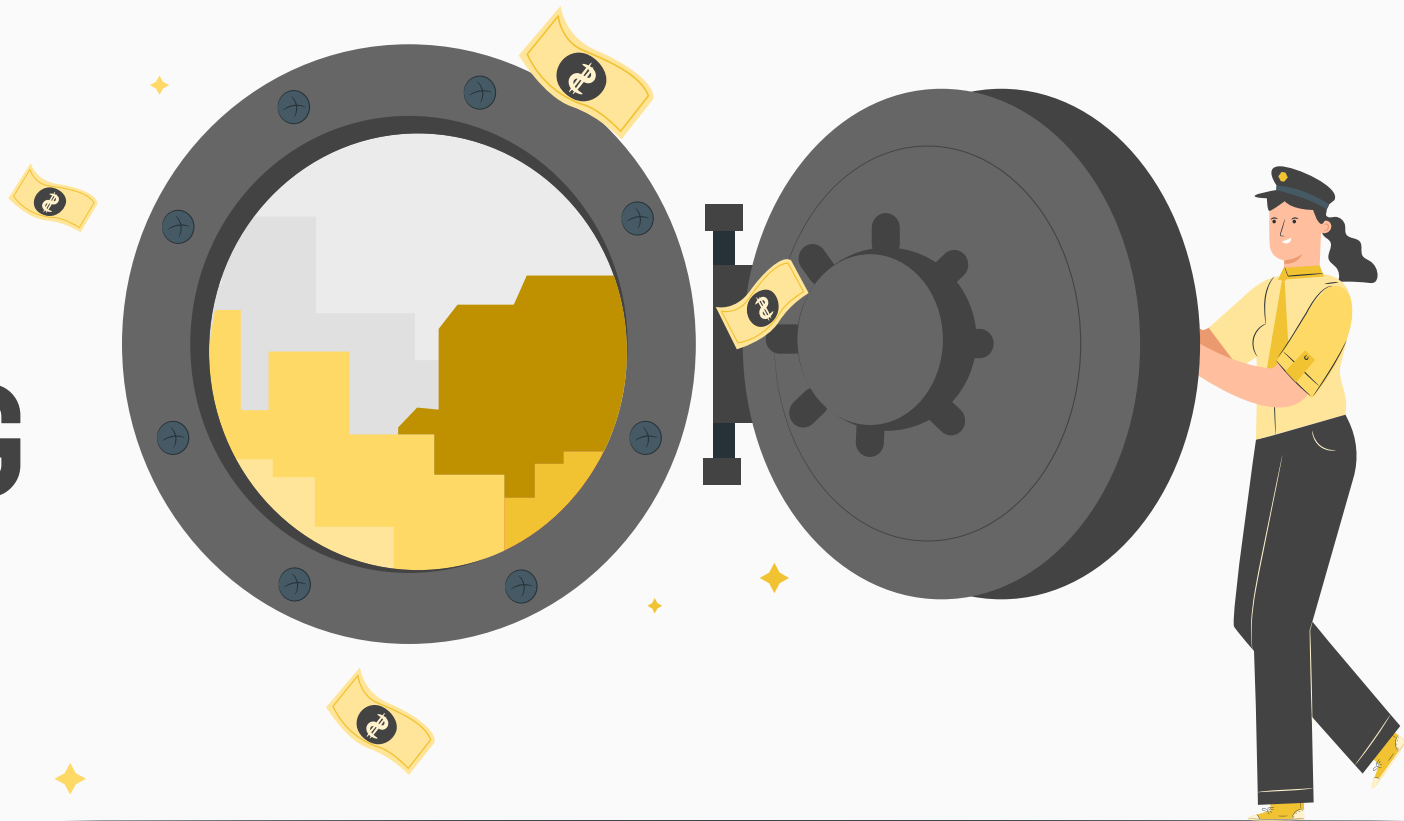
Steps:

1. Load and preprocess data for Cardano (ADA), separating the 'met_threshold' column as the binary target.
2. Scale features using StandardScaler split data into training and testing sets.
3. Build a Sequential model. Compile and fit the model. Visualize accuracy and loss.
4. Build a regression model for predicting lag time. Compile with mean squared error loss. Evaluate performance with actual vs predicted values and loss plots.

DIVING DEEPER 05: MODELING RESULTS

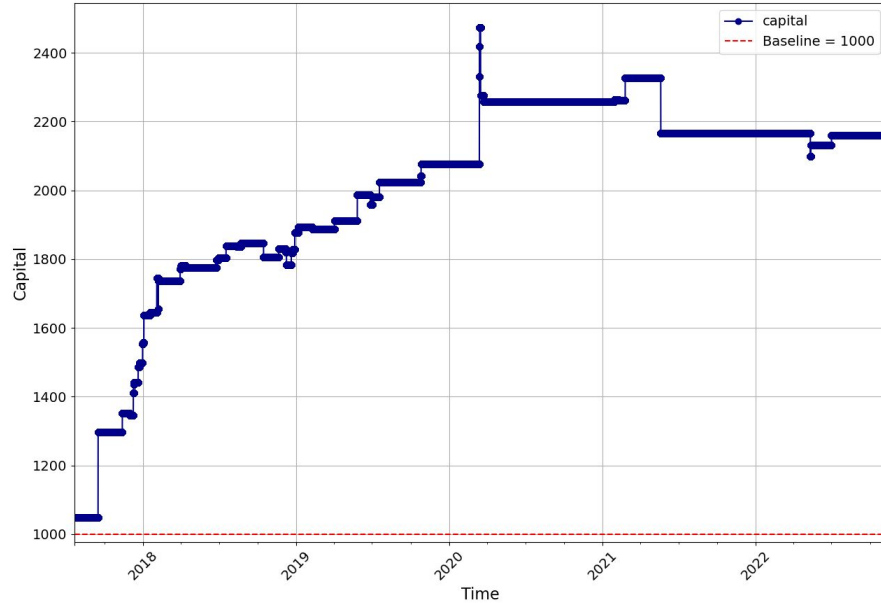


BACK TESTING



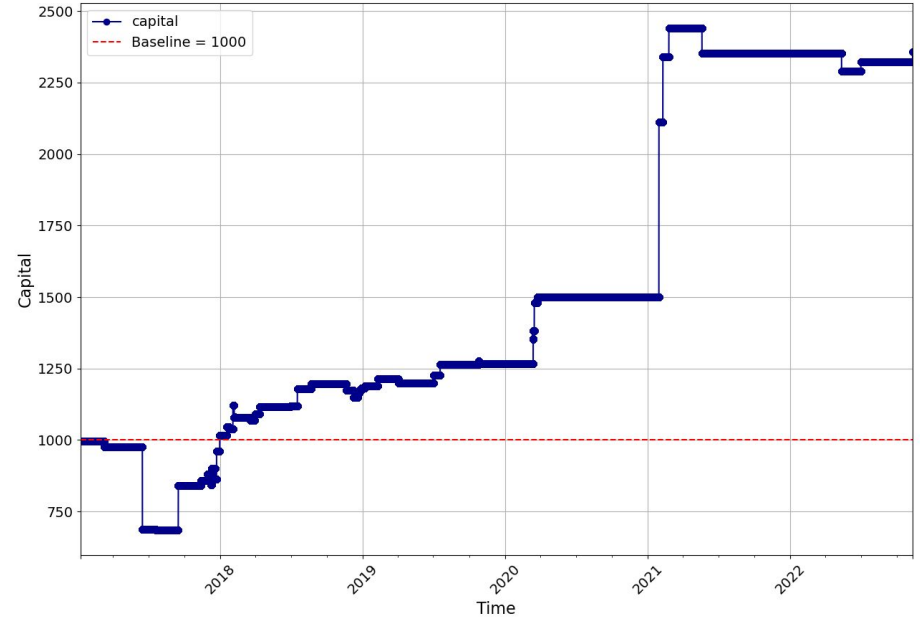
BACK TESTING OI: BEST PERFORMING PORTFOLIOS

BNB Portfolio Over Time



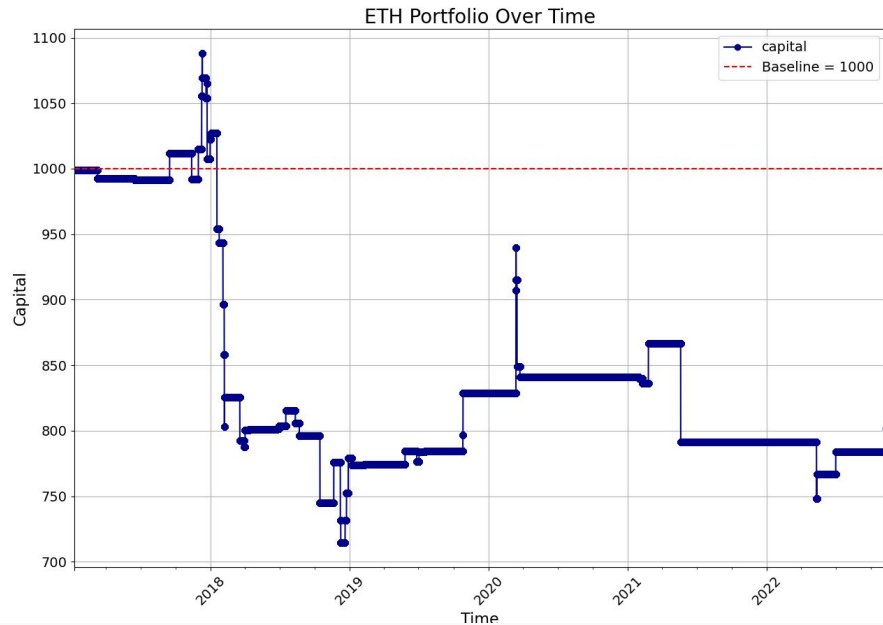
The BNB based model performed 53 trades with the best performing trade at 2017-09-15 15:00:00 from which it profited \$247. The portfolio reached an all time high of \$2473.

DOGE Portfolio Over Time

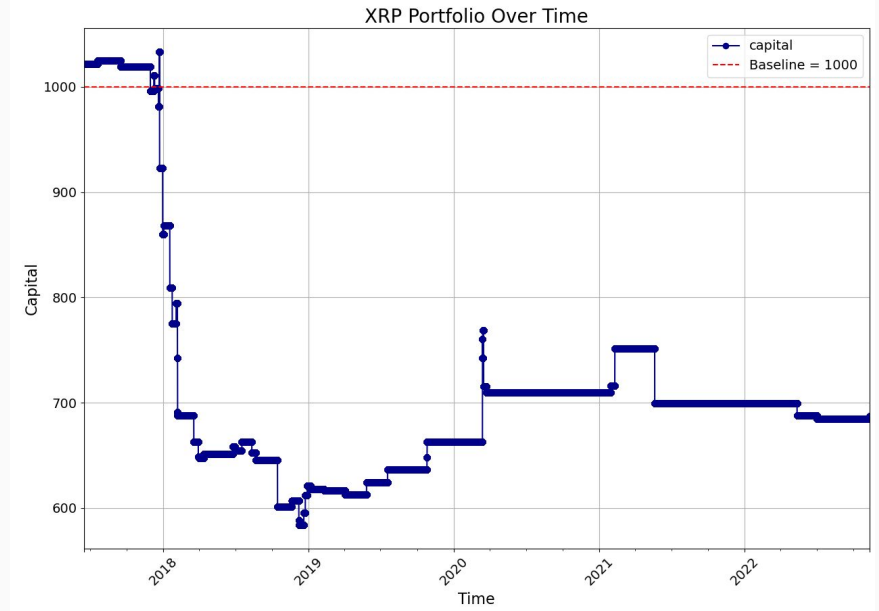


The DOGE based model performed 50 trades with the best performing trade at 2021-01-29 08:00:00 from which it profited \$612. The portfolio reached an all time high of \$2440.

BACK TESTING O2: WORST PERFORMING PORTFOLIOS



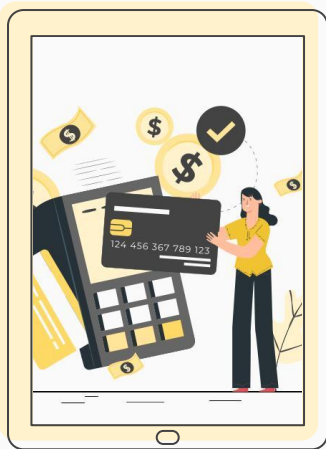
The ETH based model performed 59 trades with the worst performing trade at 2021-05-19 16:00:00 from which it lost \$76. The portfolio reached a low of \$801.



The XRP based model performed 52 trades with the best performing trade at 2017-12-22 22:00:00 from which it lost \$110. The portfolio reached a low of \$687.

RECOMMENDATIONS





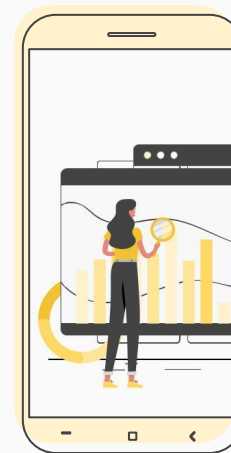
RECOM 1

Vary Bitcoin threshold of 5% to gather more data points to fit the model to.



RECOM 2

Further fine tune the modelling process to get better results.



RECOM 3

Grab by-the-minute data at the instances of a bitcoin price surge to more precisely estimate lag time.

THANK YOU!

Does anyone have any questions?

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