

Presented by BYTeminds

# Algorithmic Trading Model Development for BTC/USDT Crypto Market



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# DOMAIN DESCRIPTION

**Algorithmic trading in cryptocurrencies uses computer programs and mathematical models.**

**The objective is to leverage machine learning for consistent profits and outperform benchmarks.**

**The focus is on safeguarding investments in the dynamic crypto market.**

**A user-friendly model is designed to adapt to market fluctuations.**

**Quick and accurate decision-making is emphasized in the approach.**

**The challenge involves effectively applying machine learning to navigate market changes.**

**The goal is to minimize risk and capital inactivity in cryptocurrency trading**

# More On Problem Statement

## What is Bitcoin?

Bitcoin is a type of digital currency, also known as cryptocurrency. It exists only in electronic form and is not physical like coins or banknotes.

## How to Get Bitcoin:

You can buy Bitcoin on online platforms known as cryptocurrency exchanges.

To get started, you need to create an account on a reliable exchange.

## Wallets:

Your Bitcoin is stored in a digital wallet, which is like a virtual bank account.

There are online wallets (on exchanges) and offline wallets (more secure, like hardware or paper wallets).



# More On Problem Statement

## **Selling Bitcoin:**

You can sell your Bitcoin on the same exchange where you bought it.

The goal is to sell it at a higher price than what you paid.

## **Market Price:**

The price of Bitcoin is determined by supply and demand on the market.

It can be quite volatile, meaning it can go up or down quickly.

## **Risks:**

Bitcoin trading carries risks due to price fluctuations.

Only invest what you can afford to lose.



# Approach

1. Building a model to predict prices of bitcoin after 6 hours using an ML model
2. Analyzing previous market trends
3. Using mean reversion and forecast to capture high profits in rising market and bail out in slumping market



# STEPS TO VICTORY

01. Data Acquisition & Preprocessing

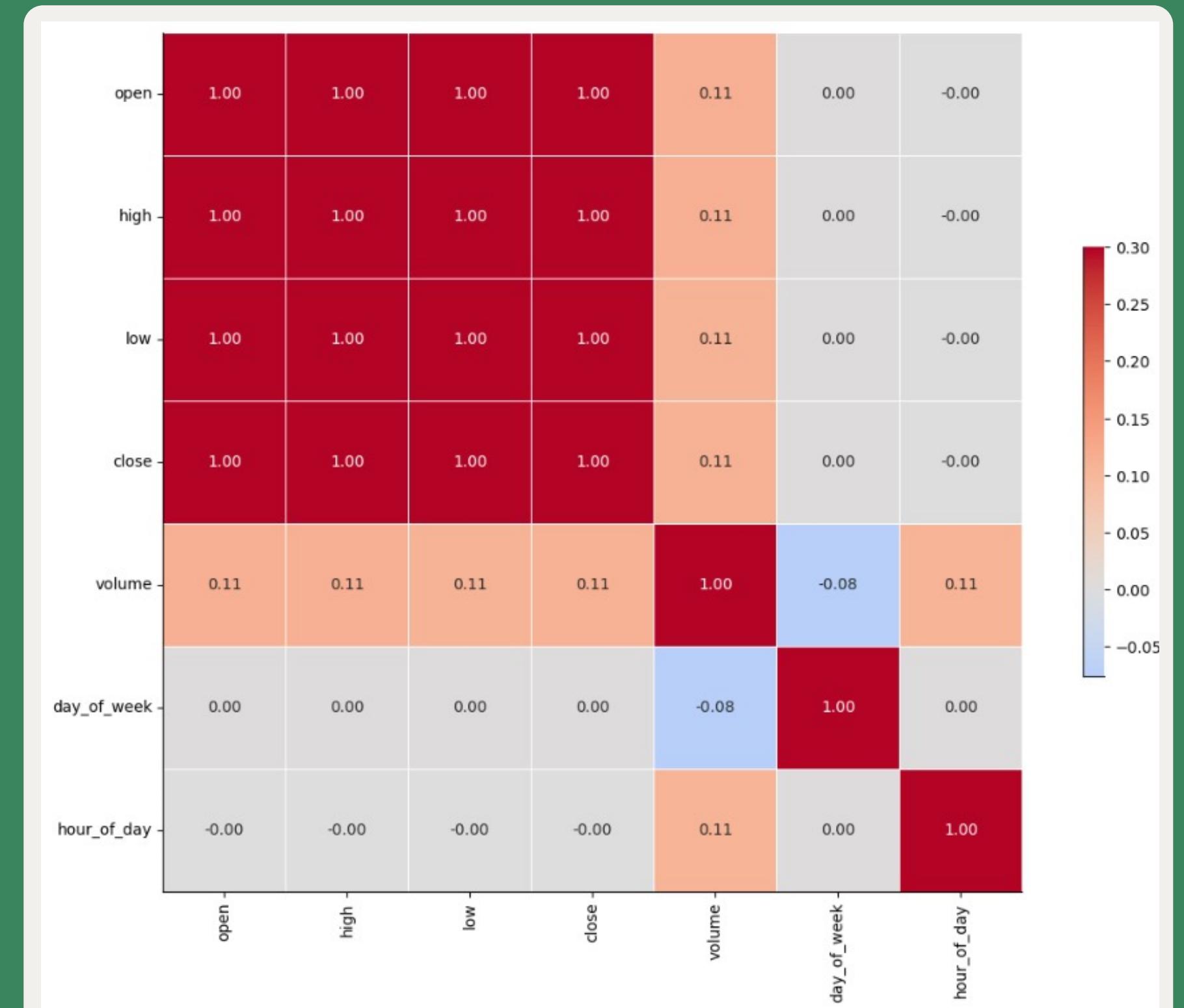
02. Data Model

03. Risk Management & Back testing

04. Optimization

# Feature Selection

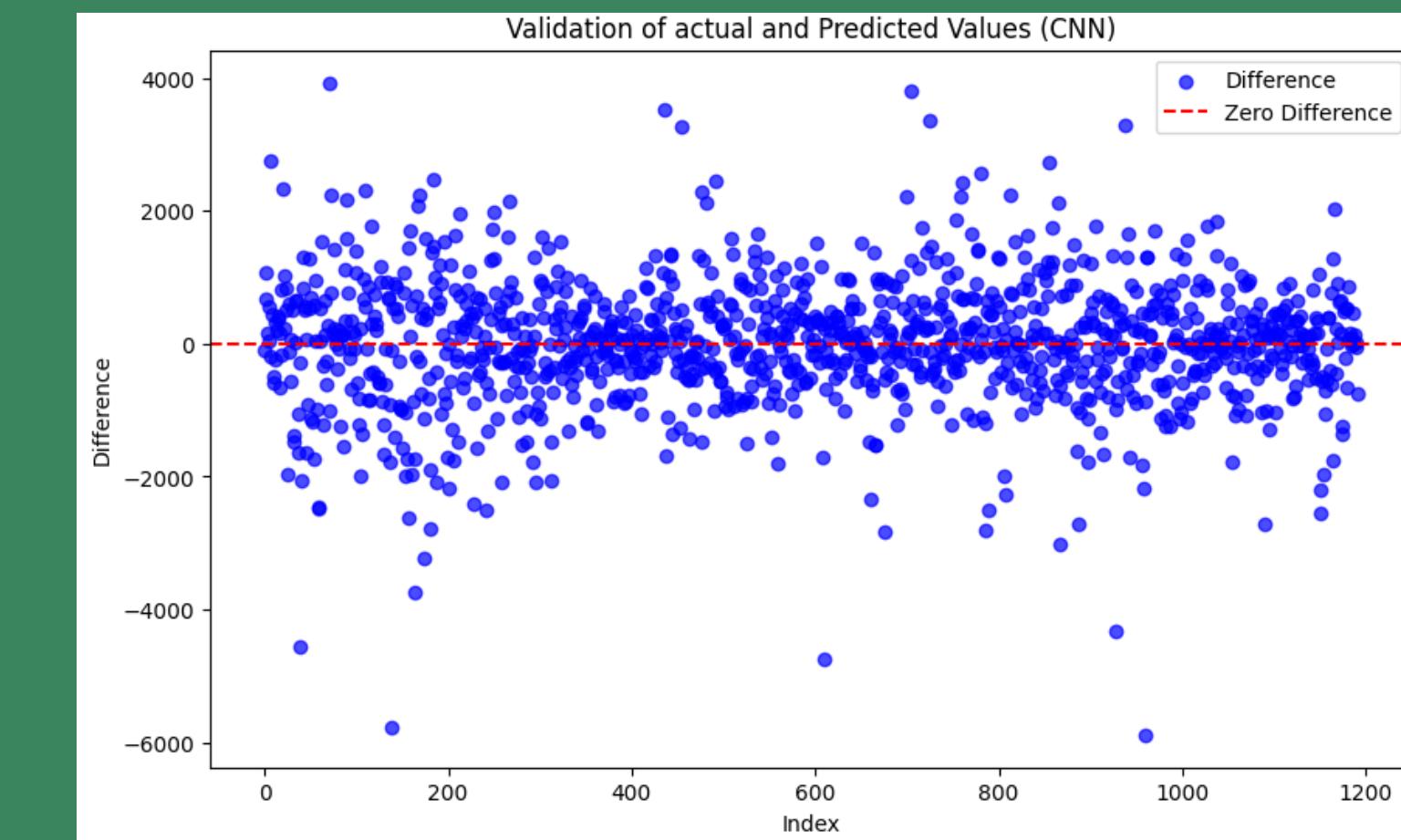
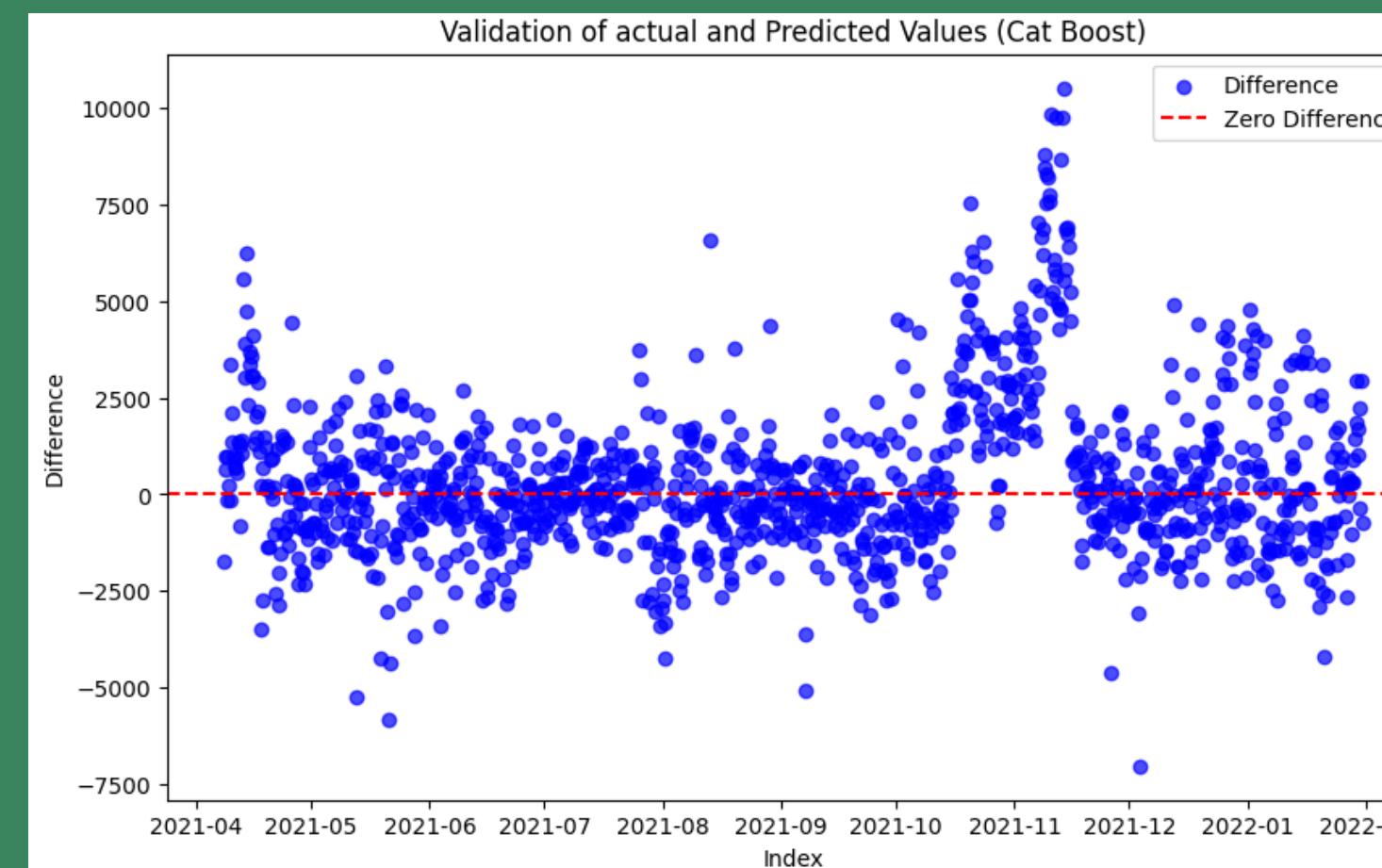
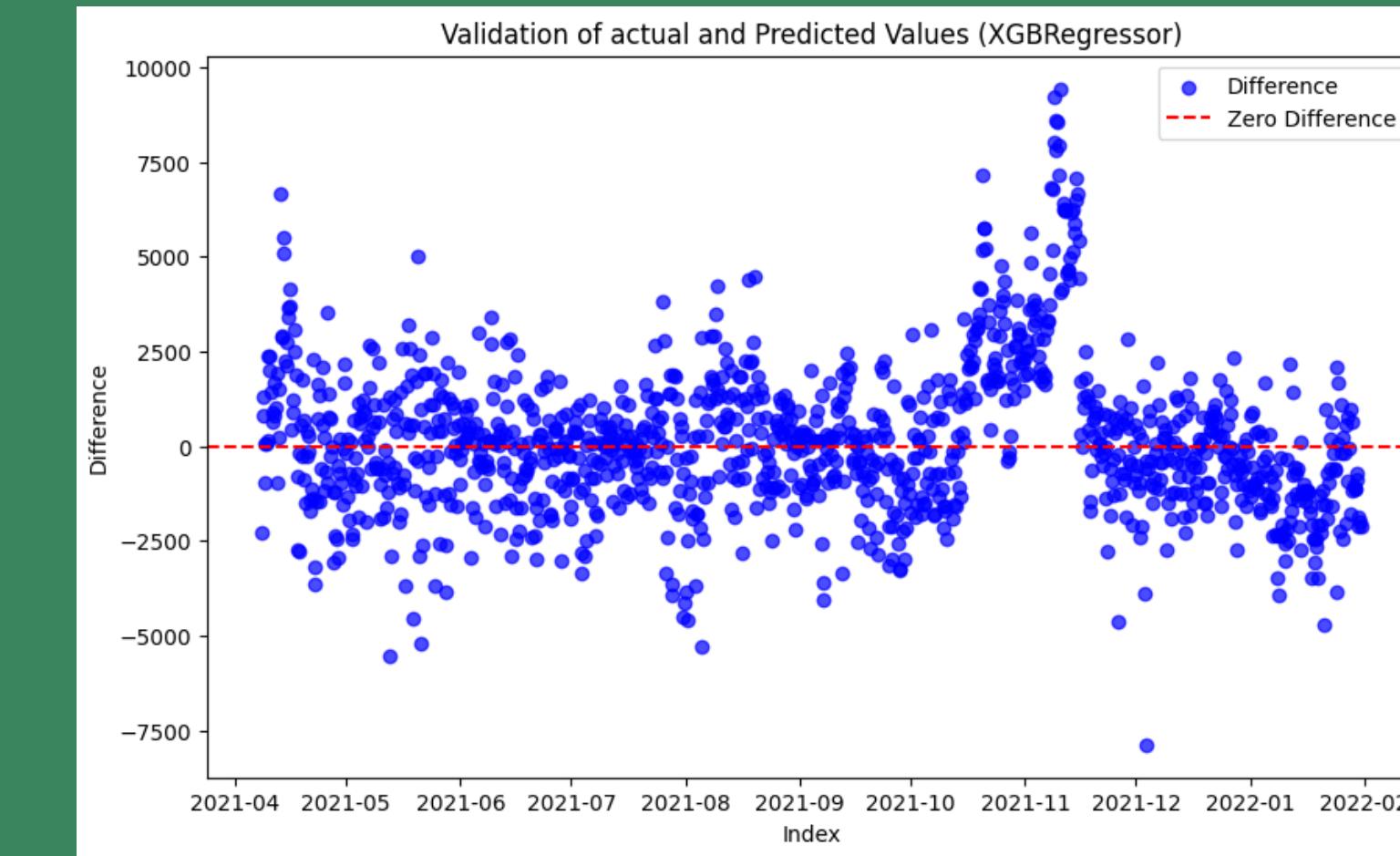
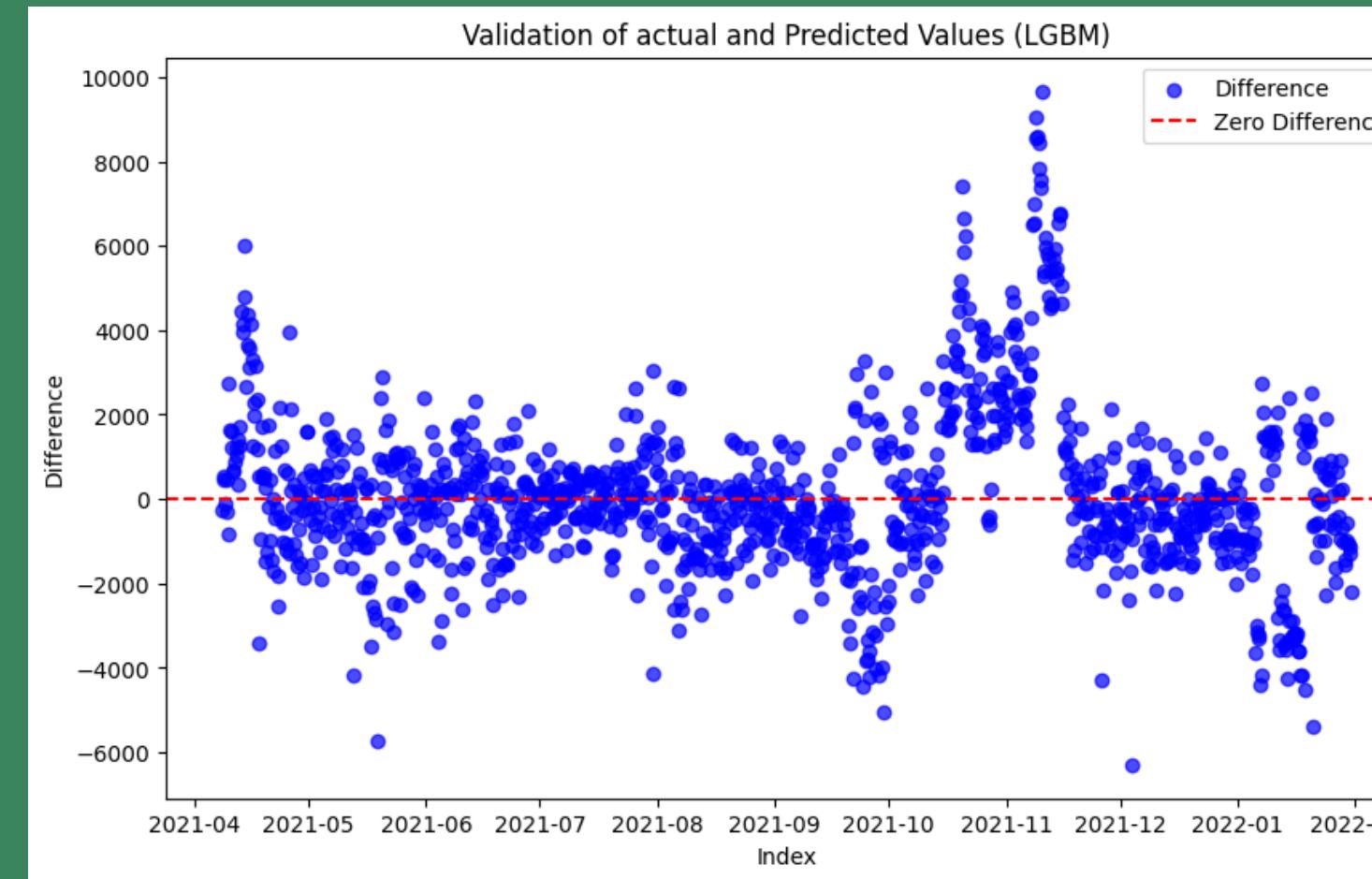
Selecting features on the basis  
correlation values



# Models Tested

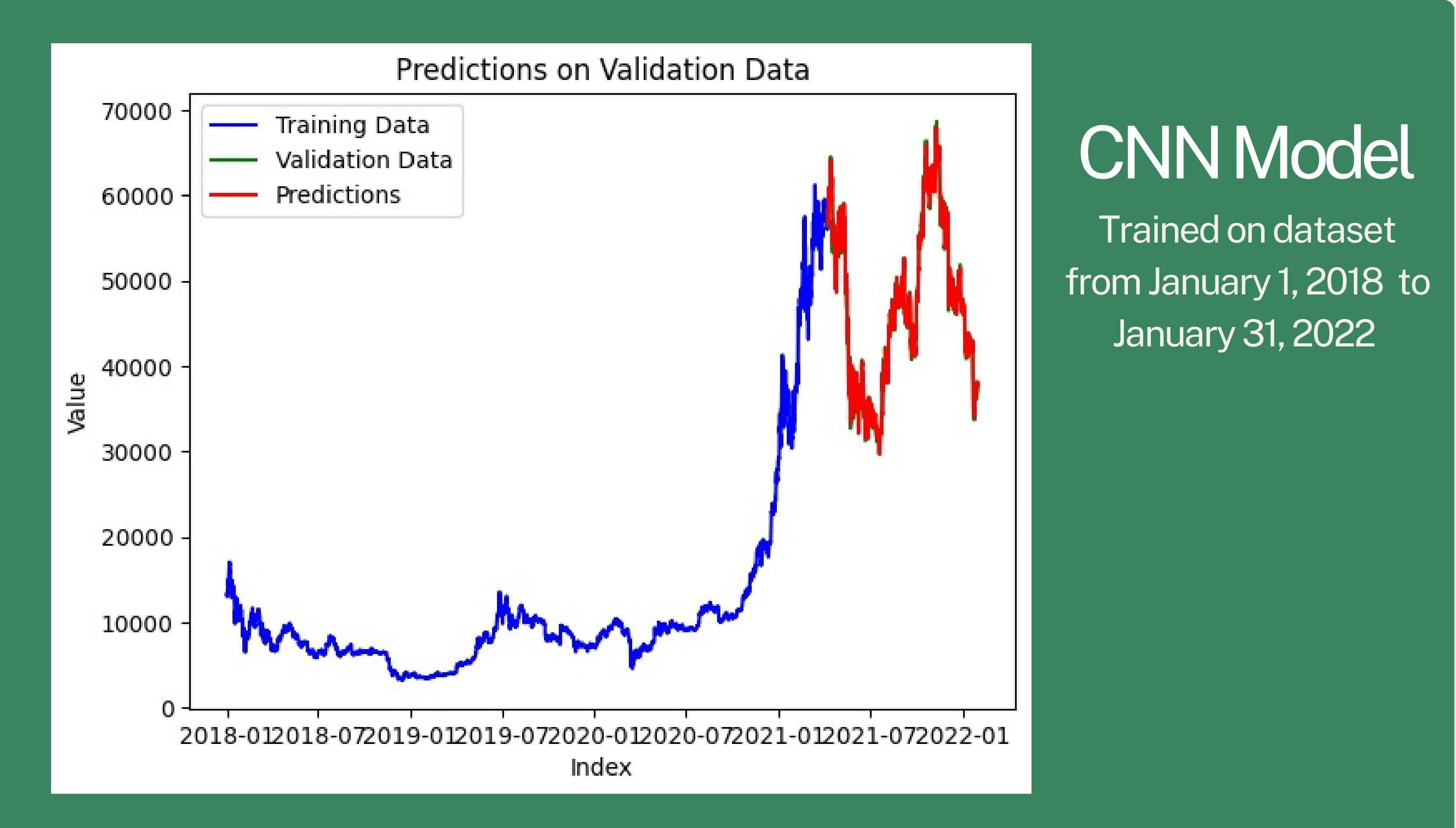
- XGBRegressor
- CatBoostRegressor
- LGBMRegressor
- CNN





# CNN Model

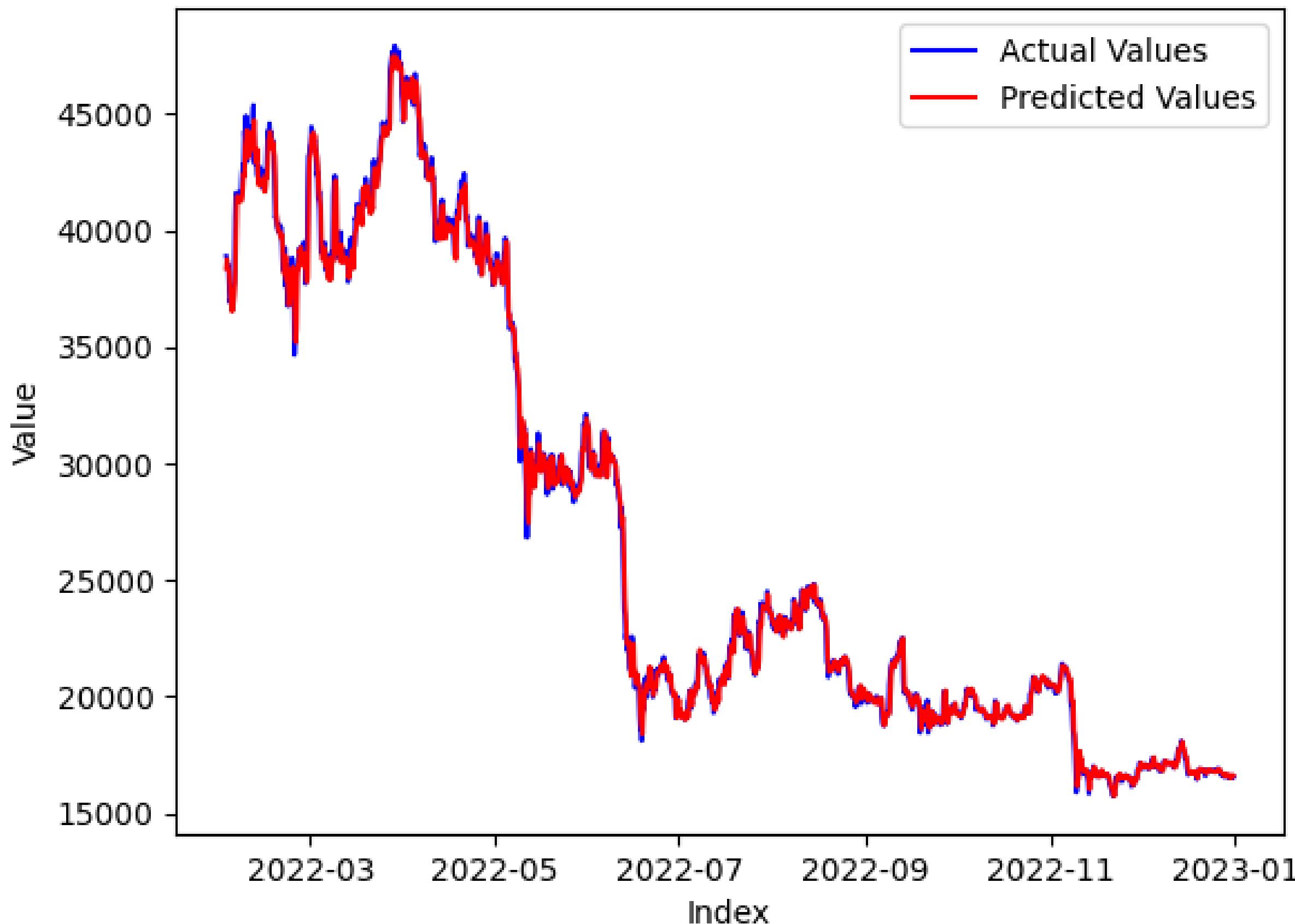
Trained on dataset  
from January 1, 2018 to  
January 31, 2022



# CNN Model

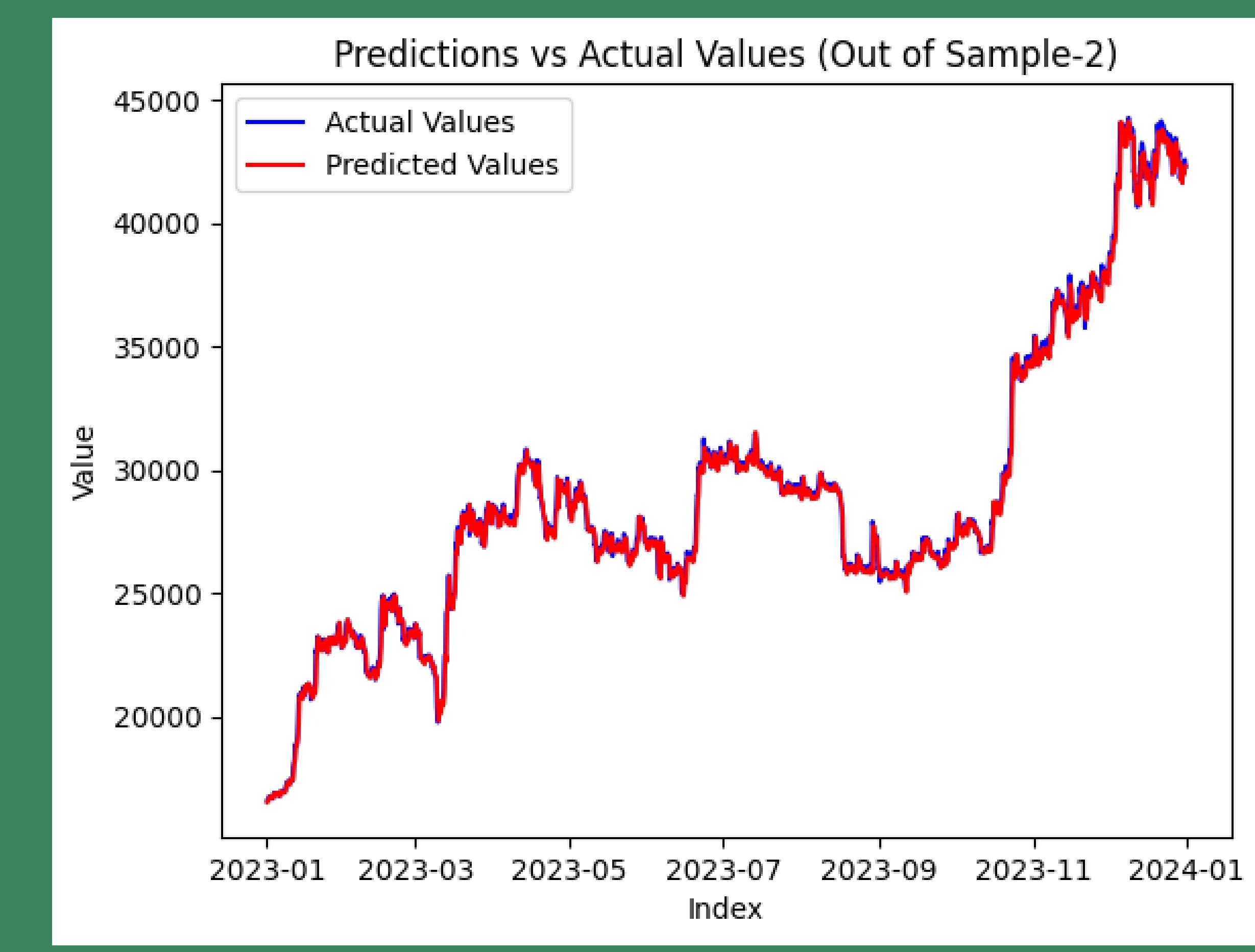
Trained on dataset  
from February 1, 2022  
to December 31, 2022

Predictions vs Actual Values (Out of Sample-1)



# CNN Model

Trained on dataset  
from January 1, 2023 to  
December 31, 2023

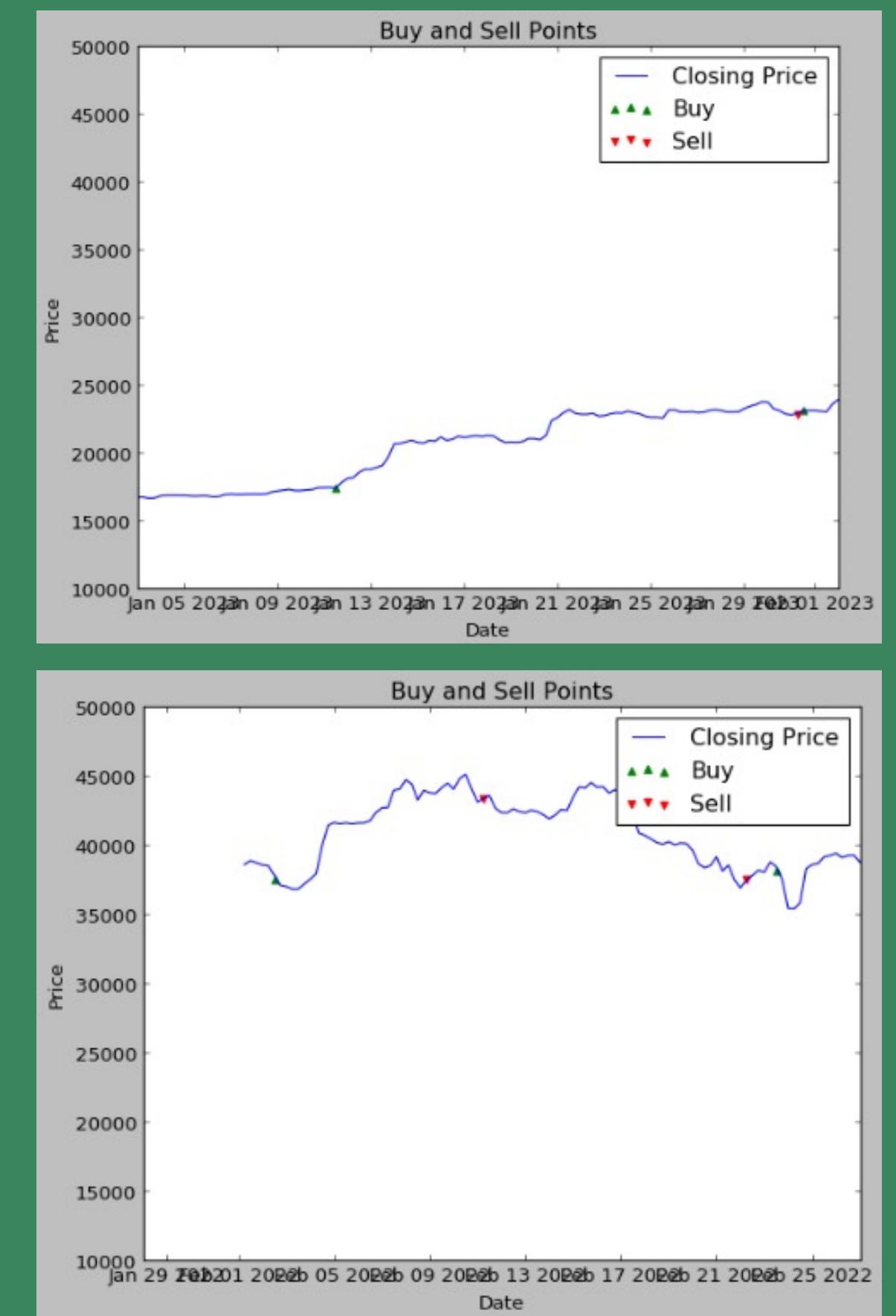
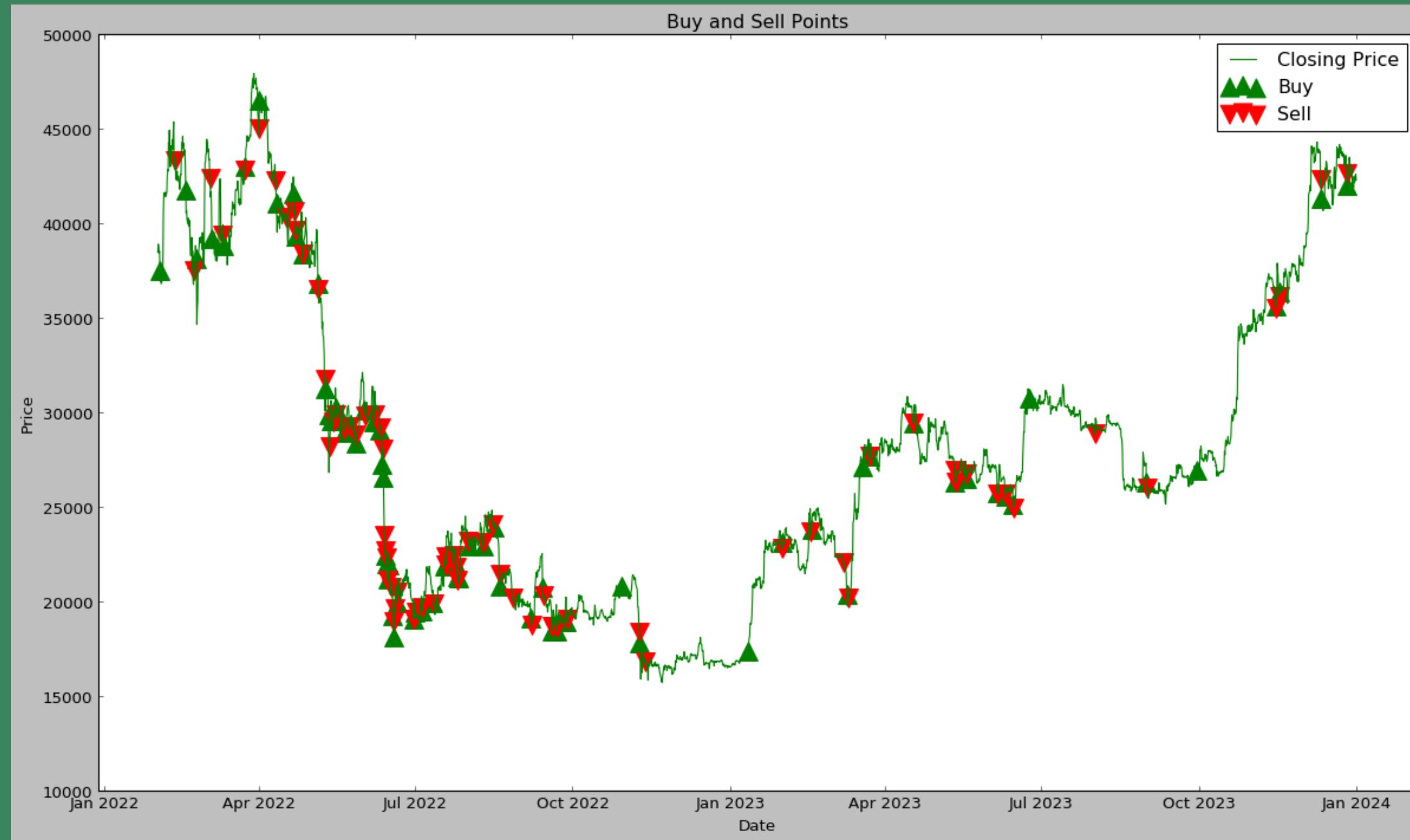


# STRATEGIES

- Stop-Loss
- Peak Capture Strategy
- Drawdown Management



# Buy & Sell Points



# Metric Analysis

**Profit and Loss:**  
16662.72127000004

The profit and loss indicate a net gain of \$16662.72.

**Sharpe Ratio:**  
1.0320492971720576

The Sharpe Ratio of 1.03 suggests the risk-adjusted performance of the portfolio, with higher values generally indicating better risk-adjusted returns.

**Win%:**  
51.42857142857142

The "Win%: 51.42" represents a win rate of approximately 51.42%, indicating that, out of a given number of trades or events, around 53.42% ended in a successful or profitable outcome.

**Max Drawdown:**  
3%

This is the biggest decrease in investment value, measuring a loss of 3% from the highest to the lowest point.

**Risk Reward Ratio:**  
1.4042321482840108

For every unit of risk, there's an expected reward of 1.40 units, indicating the potential gain compared to potential loss in trading or investing.

# Other Metrics

**Final Portfolio Value:** 116662.72127000004

**Cumulative Returns:** 0.1666272127000004

**Total Closed Trades:** 70

**Total Won Trades:** 36

**Average Winning Trade:** 1393.5213444444444

**Average Losing Trade:** 992.3724835294114

**Largest Winning Trade:** 8521.610754999994

**Sortino Ratio:** 14.036250482345837

**Average Holding period:** 4.757142857142857

**Average Dip:** 0.0348156242152614

**Max Dip:** 0.11952433208110744





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