In this project, we attempt to conduct technical analysis using price trend and volume indicators. We rely on these variables, based on the assumption that they capture and reflect all public available information and hence focus on statistical analysis of price movements.

**DATA SOURCING AND PREPROCESSING**

We used minute by minute Bitcoin data obtained from Kaggle, which covered the period from December 2011 to March 31, 2021, yielding over 3.6 million rows of information to build and train our model. Our data preprocessing included checking NaN (Null) values (no Nulls found), formatting the Timestamp column from timestamp to Datetime and renaming some of the columns.

**MODEL**

The next step was to select our ‘X’ and ‘y’ variables. For our X variables, we selected the high and low prices as well as the volume of Bitcoin traded. We also chose the Closing price as the output or Y variable and reshaped it into an array. We then split our data into training and testing using the Sklearn train\_test\_split. We fitted our data with several models (Linear regression, Lasso, Ridge and ElasticNet model) and selected the best model based on the r2 and mean squared error (MSE) scores. The selected model, Linear regression, had a r2 score and MSE of 0.9999 and 73.2997 respectively which produced the best predicted values.

**FURTHER TESTING**

Although our model can be tested on any stock, we chose to do a further testing on Bitcoin data from April 2021 to July 1, 2021, and we plotted the predicted results against the actual results. It is worth noting that both lines appeared as we had suspected based on the r2 and MSE values obtained from training the model.

We then calculated moving averages from the actual closing values. The reason for calculating the moving average of a stock is to help smooth out the price data over the specified period by creating a constantly updated average price and this helps mitigate the impacts of random, short-term fluctuations on the stock price. We calculated a 15-day and 30-day simple moving averages (SMAs) as well as an exponential moving average (EMA). We chose to plot the 30-day moving average against the exponential moving average and they both depict a similar trend to the actual closing price and hence gives users a fair idea of the general price trend of the stock.