Exploratory Data Analysis

In this project, we are going to try to predict the volatility of the price of apple stock. The first step in any data science project is to explore the data to guide modelling decisions. I created four different views of the apple stock price. This is simply the adjusted close price for apple over the past ten years:

Chart, line chart

Description automatically generated

Residual plots are useful to understand how a time series changes over time. This is a residual plot of the apple stock price.

Chart

Description automatically generated

When dealing with assets, it is often more useful to work with percentage residuals rather than the absolute residual. The is the plot of the percentage change day-over-day of the apple stock price:

Chart, line chart

Description automatically generated

Predicting the price of a stock is notoriously difficult because stock prices are very noisy. An easier, but still important, task is predicting the volatility of a stock’s price. This plot is the standard deviation of the percentage change day-over-day of apple’s stock price, calculated over a ten-day window.

Chart, histogram

Description automatically generated

And this is the variance of the price.

Chart, line chart

Description automatically generated

There seems to be more signal in the variance and standard deviation plots than the percentage residual plot, which looks like Gaussian noise. The standard deviation plot has a clear increasing trend. The variance plot also tends to increase towards the end. Additionally, it seems that the variance plot can be decomposed into seasons.