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This Python script is designed to load historical stock price data for Tesla (TSLA), Amazon (AMZN), and Google (GOOG), perform basic time series analysis, and make predictions using a naive forecasting approach. I kept my analysis and modeling approaches exactly the same for all three stock’s while the final predictions netted varying results.

### **Time Series Analysis**

For my preliminary analysis of the time series datasets, I began by just plotting the data over time on separate graphs to get a better understanding of the movements as well as any trends to be spotted. I also created a second, almost identical, plot for each stock after splitting the data into a training and testing set. I had 750 data points so I assigned 550 points to train the model and 200 points for testing the model.

### **Forecasting Model**

For my forecasting model, I opted to go for a very standard prediction method known as the naive forecaster. The naive forecaster uses simple strategies for making predictions based on past data. I used the “mean” strategy in my model where predictions are based on the mean of the observed values within each season. I used a seasonality parameter (sp) of 260 in order to model the annual seasonality of these stock prices. I chose 260 as my seasonality parameter because stock prices are not posted on the weekends, and with 52 weeks in a year, this left roughly 104 days each year excluded from my data. Therefore a full year cycle of my data is about 260 days. For each stock I plotted the predictions alongside the training and testing data

### **1. Tesla Stock Price Forecast**

The predictions that can be seen on the Tesla plot can be interpreted as fairly accurate. Although the model predicted a large jump in stock price early, it returned and stayed relatively close to the following observed testing values. The model strayed off at times but also was also very precise and followed changes in the stock prices extremely closely at other times.

### **2. Amazon Stock Price Forecast**

The predictions displayed on the Amazon plot do not perform as well as those of the Tesla plot. The model overshoots Amazon stock prices early and gets more accurate as time goes on while still predicting a higher price. Eventually however, the model begins to drastically undershoot the observed testing prices as it did not anticipate such a drastic climb in price.

### **3. Google Stock Price Forecast**

The predictions shown on the Google plot take a different approach than Tesla and Amazon. The model does not heavily overshoot Google’s stock price early on, and remains relatively accurate with the beginning of the observed testing data. However, the model fails to predict the consistent climb in Google’s stock price and undershoots the stock prices later on in the plot.