The day-to-day changes in the stock market are very difficult to predict; as such, many amateur investors rely on simple techniques that make no effort to time the market, such as dollar cost averaging. The goal of this project was to outperform dollar cost averaging by using an investment strategy informed by stock changes predicted by statistical learning. Our model focused on predicting the performance of a single stock. Our model was generally unsuccessful in predicting day-to-day changes, but was successful under certain cases. It appears that the complexities of the stock market cannot be modeled by basic linear models, but more complicated neural networks did show some progress. While modeling a regression proved to be very challenging, it was possible to get reasonable accuracy by modeling it as a classification problem. Moreover, the informed investment strategy was able to outperform dollar cost averaging in stagnant and bearish markets. As long as the stock market remains very difficult to predict, dollar cost averaging remains a simple yet effective investment strategy.