Technical Report Writing

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Topic: Stock Market Price Prediction using Machine Learning

Methodology:

Support Vector Machines:

Support One of the finest binary classifiers is the Vector Machine. They draw a decision border with the majority of points in one category on one side and the majority of points in the other category on the other. Consider x = (X1,...,Xn), which is an n-dimensional feature vector. A linear boundary (hyperplane) has the following definition:

$$\beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n = \beta_0 + \sum_{i=1}^{n} \beta_i X_i = 0$$

The sum of items in one category will be larger than 0, while the sum of elements in the other category will be less than 0.

We carry out our research by altering this parameter n to examine how patterns in volatility and momentum, both of the individual stock and the index, may be utilised to forecast future changes in the stock.

Let n1 be the index parameter and n2 be the supplied stock parameter, with n1,n2 being 5,10,20,90,270.

One week, two weeks, one month, one quarter, and one year are represented by these numbers. We supply a combination of n1,n2 in each iteration, and we utilise these parameters to compute our feature sets, train on the training data, predict on the testing data,

and check the correctness of the results. We perform 25 iterations, one for each of the n1,n2 combinations.

We look at every trade day from 2007 to 2014 and compute the four characteristics on that date in order to determine the features. On that specific day, the four characteristics are combined into a single vector. We begin calculating feature vectors on the d = (max(n1,n2) +1)-th day since we average over the previous n1 days for index and n2 days for stock. If n1 = 5, and n2 = 10, then d = 11 and we begin on the 11th date. This is due to the fact that volatility and momentum are both computed using data from the previous day, yet there is no data before the first date.