ML - Lab 3

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1 Abstract

In this report you will find a brief explanation of a trading algorithm implemented in Quantopian using python programming language, that uses three different machine learning algorithms to generate predictive models about a set of variables of a stock, and from this predictions it sends exchange orders to buy or sell stocks based on it's knowledge. At the end of the report some of the backtesting results are shown.

2 Machine Learning Techniques

This algorithm uses **Gaussian Naive Bayes**, **Logistic Regression** and **Linear Support Vector Classifier** models, which are included into the code using Scikit Learn tools.

Each of this machine learning algorithms is designed to predict n forward days the price of the stock based on financial variables as the returns of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 days before, assets growth 3 months and 39 weeks before, asset to equity, capex to cashflows, EBITDA to assets and operating cashflows to assets ratios, and finally some EBTIDA yield, return on invest capital, MACD signal line for 10 days and the net income margin of the US Tradable Stocks.

3 Backtesting Results

3.1 Gaussian Naive Bayes Classifier

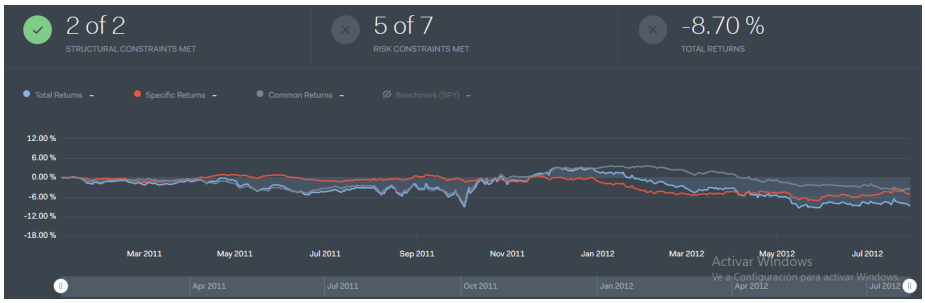

Figure 1: Gausian Naive Bayes classifier results.

3.2 Logistic Regression Classifier

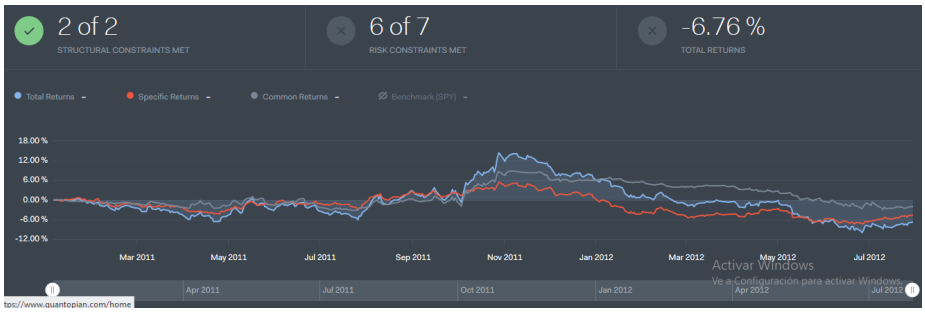

Figure 2: Logistic Regression classifier results.

3.3 Linear Support Vector Classifier

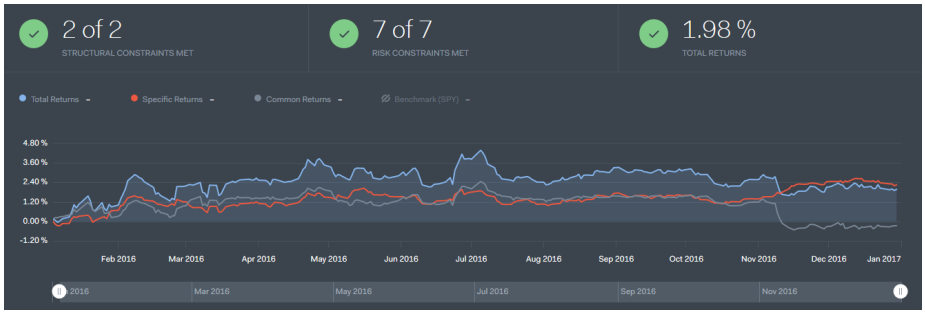

Figure 3: Linear Support Vector classifier results.

4 Conclusions

After testing the different machine learning algorithms with the same set of variables, we see that the best results were obtained with the Linear Support Vector Classifier, this method required some parameter optimization as it is a bit heavy to train and test each time. The other methods were not as good, but are faster and maybe with some different variables these will show better results.