Name of student, Name of instructor, Project title, Credit hours, Term (i.e. Spring 2012), Brief description of the project, Brief summary of the results

A single page report is fine so long as you are satisfied with the effort. I have attached a sample report of a recent 49600 project I supervised.

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MACHINE LEARNING APPLICATIONS

Conducted by: Derek Lee  
Supervised by: Prof. Okan Ersoy  
Course details: Spring 2014, 2 credits

ABSTRACT

Quantitative finance is a modern approach on financial investment that is quickly becoming the norm on Wall Street. The basis of quantitative finance is to utilize mathematical methods to analyze financial data and make predictions about the outcomes. This paper attempts to investigate a particular category of these methods known as technical indicators and to evaluate their performance in a simulated trading scenario. In particular, we will focus our investigation on the Moving Average Convergence Divergence (MACD). The paper discusses how the appropriate financial data was obtained, how the MACD script was developed and how it was utilized in a financial strategy. Our conclusion is that MACD is not a good outcome predictor on its own and should be used in conjunction with other technical indicators.

PROJECT SETUP:

Daily stock prices of 20 random companies were obtained from Yahoo Finance to be used as input data. Appendix A shows the script used to pull these files. For the purpose of this project, we used daily prices of up to 10 years.

The MACD script is written in Python, mostly to take advantage of Pandas, a data analysis library for Python. MACD relies on the idea of a moving average (MA), which is the average of a specific number of days prior to the current date. MACD utilizes two sets of moving averages, the short-term moving average (12 days) and the long-term moving average (26 days). Because MA uses past data, it is a lagging indicator and in general the longer the time period for the MA the greater the lag. For two MAs of different periods, the difference in lag is used to identify the direction a price is trending. A short-term MA crossing above a long-term MA indicates an upward momentum, an indicator to buy. Conversely, a short-term MA crossing below a long-term MA indicates a downward momentum, an indicator to sell. As the momentum increases, the divergence between the two moving averages increases.

For this project we take an imaginary investment amount of $50,000 to invest according to the MACD indicators. Two assumptions are made to simplify the analysis, first that there is no fee charged for each transaction and second that our actions do not influence the market.

*Retrieve financial data at the desired granularity.*

*Wrote Moving Average script*

*Used Moving Average to design trading strategy.*

*Applied trading strategy and measured results.*

RESULTS:

Display sample of fetched financial data.

Display sample MA graph

Explain trading strategy

Analyze trading strategy. Show performance.

Explain performance.

CONCLUSIONS:

FUTURE PLANS:

How to use MA information

Further enhancements to script

CITATIONS:

APPENDIX:

http://sentdex.com/sentiment-analysisbig-data-and-python-tutorials-algorithmic-trading/how-to-chart-stocks-and-forex-doing-your-own-financial-charting/

http://www.investopedia.com/articles/technical/082701.asp