

AMOD 5250

Final Project Instructions

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Title : Stock Market Analyzer

Purpose :

Everybody likes to keep growing his/her money while they are sleeping. Most of the people earn money working as professionals in companies. Their main income is from services they provide. It is referred to as active income. Those who are even a little bit aware about the financial management would not be satisfied with the active income. So people try to find a way to make money from some other sources. There are a lot of sources available to generate passive income such as renting out the property, buying government bonds, and investing in the stock market. People wish to let money work for them. The passive income can be considered as a side income which helps a person to achieve his/her financial goals. Investing helps people to generate side income and grow over a certain period of time. Investing in the stock market has always been popular among these investors. The stock market is not as promising as other fixed return investment options. There is no limit of return on capital in the stock market as well as there is a lot of risk of losing capital. Other investment options like mutual funds, bonds and fixed deposits may give you a constant amount of return on investment but the stock market has no limit of profit. But there is one condition that, If you understand how it works and how to trade or invest in the stock market wisely so that you eliminate all of the possibilities of losing money. Stocks are a crucial part of the investment portfolio. One should know that there is risk when investing in the stock market.

In order to increase profit and decrease loss in the stock market, we need to make decisions at the right time. Some people also end up making bad or wrong decisions which lead them into debt. It is important to have at least a basic level of knowledge so that risk is known risk not an unknown risk. One of the ways to become confident about investing in the stock market is to understand the charts and fundamentals of the company. The basic knowledge of fundamental analysis and technical analysis is necessary.

The main purpose of this project is to perform technical analysis on the historic price of the stocks which helps to make decisions till some extent and save from incurring huge losses. These historical data can be shown in the form of various charts such as candlestick chart, line chart, bar chart, matchsticks chart. Even enough information about the candlestick chart can make you investment savvy. If we are able to understand the usage and limitations of stock market analysis then it can make us better traders/investors. This project aims to carry out some of the powerful techniques as well as understanding of useful candlestick patterns to identify the investment

opportunities. It interprets the chart very easily that any layman can make decisions accordingly. Along with this technical analysis, the other purpose is to perform a fundamental analysis and comparison of different stocks. There are a lot of companies listed under one industry or segment. So you need to be very careful about which company to pick for your investment. It is a cumbersome process to choose from a large pool of stocks available in the market. Hence, this project will also provide you the opportunity to compare fundamental information of different companies so that you can select the most promising company to invest in. The right time to enter the market and the right time to exit from the market really matters to make good returns on the capital invested. This project also aims to provide the information regarding the trend of a particular company as well as a signal of buying or selling. As per the trend, if a stock price seems to go upward then it will recommend to stay invested in the particular stocks or if a stock price seems to go downward then it will recommend to exit from the trade and book your profits.

Problem Addresses :

This project mainly focuses on identifying the right time to buy or sell as well as direction of stock price using technical indicators.

Larsen, F. (2007). Automatic stock market trading based on Technical Analysis. Norwegian University of Science and Technology: NTNU Innovation and Creativity.

This paper backs up our project's statement that the methods used to analyze and make good investment decisions fall into two main categories which are fundamental analysis and technical analysis. Fundamental analysis is a traditional approach that determines the financial factors affecting the company's business such as earning ratios, market capitalisation, revenue generated, and quarterly reports. These fundamentals also help to infer future prospects of the company. On the other hand, technical analysis is a modern way to evaluate and forecast the price movement based on the supply and demand in the market, volume and momentum.

Forecasting Stock Trend Using Technical Indicators with R, *International Journal of Computational Intelligence and Informatics*, Vol. 6: No. 3, December 2016. ISSN: 2349-6363

This paper attempts to study the effectiveness of technical indicators on stock trading to assess the company's performance over a certain period of time. The major technical indicators in technical analysis include Moving Averages (MA), Moving Average Convergence/Divergence (MACD), Relative Strength Index (RSI), Volume, Bollinger Bands, Exponential Moving Averages (EMA). All of these can be used to predict the direction of the future price movements. Experts of technical analysis study the price chart for the price patterns and use above mentioned

indicators to forecast the trend. These momentum oscillations are derived to study stock price graphs. We also want to use these indicators only to fulfil our purposes of this project.

The Impact of Market-Based Ratios on Stock Returns: The Evidence from Insurance Sector in Turkey, International Research Journal of Finance and Economics. ISSN 1450-2887 Issue 84 (2012).

<http://www.internationalresearchjournaloffinanceandeconomics.com>

This paper backs up our goal to perform stock comparison using some ratios. They have used Earning per share (EPS), price to earning (P/E) and market to book (M/B) ration as a fundamental analysis. Investors can use this information to increase their profits. The real value of the stock can be determined by using such market based ratios. If the real value of the stock is greater than the market value of the stock then investors should prefer to invest in this stock in hope to get a good return. This explanatory information explains the changes in current stock returns over a period of time and also one period ahead.

Stock Market Efficiency and the MACD. Evidence from Countries around the World, Procedia Economics and Finance, Volume 32, 2015, Pages 1414-1431.

This paper tells how Moving Average Convergence Divergence empirically evaluates the market efficiency.

Technical analysis and National Stock Exchange of India: testing the RSI rule using CNX Nifty index, Afro-Asian Journal of Finance and Accounting. Print ISSN: 1751-6447 Online ISSN: 1751-6455.

This paper says that technical analysis is a strategy for seeing if it is worth purchasing or offering a stock.

Instructions on its operation :

The first thing we require to implement this project is data. In the case of this project, data evolves everyday because stock prices are marked daily as the market opens. So It is really important to get the live price of the stocks. Yahoo Finance serves the data related to stock's price as well as stock's quote very easily, in an applicable manner and almost real-time details. In order to use live updates from Yahoo Finance, we are using the quantmod package of R. Quantmod is Quantitative Financial Modelling and Trading Framework for R.

<https://cran.r-project.org/web/packages/quantmod/quantmod.pdf>

Next step after having the data is how to display it in a visually good format. Most of the time to perform technical analysis, the candlesticks chart is being used. In this project, we are focused on Indian stock equities. There is an option to choose the ticker name of the stock from an automatically generated list. You can even select the date range of the stock price. There is also an option to choose the type of chart you want to see such as candlestick chart, matchstick chart, bar chart or line chart. Once the selection is done, the chart of the stock price is shown on the main panel. The chart is also drawn using the quantmod package's function called `chartSeries`. How the candlestick charts are formed, what it indicates is also covered. The basic details related to the stock such as name of the company, name of the exchange where it is listed, open price, 52-weeks high and low can be seen on the main panel as well.

Along with the chart, it also shows the current trend of the stock price like whether it is up trend or down trend as well as the signal to buy or sell or do nothing. If it is an up trend then it recommends buying in the hope of moving the price further up and receiving an ample amount of profit. If it is a down trend then it recommends to sell and book profits if you hold those stocks before the price falls even down. So this signal helps an investor to decide when to enter and when to exit from the stock's trade. Useful and powerful technical indicators are also embedded in the chart only. You can see the blue line and red line drawn along with candles which represent the shorter exponential moving average ($n = 10$) and longer exponential moving average ($n = 21$) respectively. Then a chart of moving average convergence divergence (MACD(12,26,9)), relative strength index (RSI(14)) and volume (millions) of stock are placed just below the candlestick chart. How to read and infer from these indicators is also covered. The 'how to?' part contains the information regarding what to look for in these indicators. The understanding and knowledge of these indicators build up the confidence in the investors or traders. All of these technical analysis indicators are added to the `chartSeries` function of the quantmod package.

The other main part of this project, stock comparison, is carried out on the display as a radar chart. This radar chart eases the comparison between stocks and ranking because it provides multiple data points and variation between them. Radar charts are very useful for comparing or ranking purposes. The auto-completed input box will let you select more than one stock's ticker name which enables you to choose stocks to compare. This comparison is based on the details such as market capitalization, volume, P/E ratio and Price/Book ratio. This information can be derived from `yahooQF()` function by providing interesting metrics then passing it to `getQuote` function. I have also plotted the table in case to view the actual numbers because the radar chart is expected to show you relative comparison between stocks.

The price of the stock is estimated based on the market sentiments, demand, supply and company's performance. So the prediction of the stock price using statistics does not make sense

because there are other factors which drive the price, not only the historic data. The historical price data is just to make sure of the performance of the company so far and build our confidence.

Reference :

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