**Trimester: THIRD TRIMESTER**

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| Project Name: | Trading Analytics forDay Trading in Stock Market |
| Background Information | Majority of share market investment decisions are highly influenced by herd mentality. To avoid herd mentality, we should not blindly invest in any stock based on what others are doing.  When making investments in Stocks, we need to study the related factors more carefully. In some industries, data is not easily available and we need to put in extra efforts to find and evaluate data and make wiser decisions accordingly. |
| Statement of the Problem | * To design and carry out experiments using scientific methods, all formulated hypotheses must be valid. The validity of the theory has to be proved. There must be a possibility to refute the theory. The result of the hypothesis must be valid. Without these requirements, hypotheses and results are ambiguous. Therefore, it is necessary to forecast buy and sell choices in the stock market using appropriate rule-based hypothesis testing models. * It is also required to develop time-series techniques that use lag moving averages to smooth out time-series data so that these processes can be used in technical analysis to predict future securities prices. |
| Proposed Solution | A rule-based model is being developed to do hypothesis testing to determine whether the chosen stock's price is crossing any of the following moving averages: the 7-day, 13-day, 20-day, 100-day, and 200-day moving averages.  It will be a purchase decision if the projection indicates that the value will be higher than various Moving Averages.  Exponential Time series Models will be used to create the same five hypothesis testing models.  After that, five further ARIMA-based time series models will be created to support our buy or sell recommendation for every stock.  The idea is to determine how much profit, assuming $10,000 is invested in HDFC stock, will result from our forecasting outputs from these 15 various models. |
| Detailed Scope of Work: | HDFC excel data is put in Tabular form in step 1.  Step 2: The time series data is plotted for the HDFC stock that is provided as a dataset for the project for all ten years.  The 7-day moving average time series data is added in step 3.  Step 4: The data for a 7-day moving average time series is being plotted.  Step 5: The data from a rolling 7-day moving average is included in the Data frame.  Step 6: It is determined whether the closing price value on a certain prior day was lower or higher than the current 7-day moving average.  If yesterday's closing price was below the 7-day moving average and the overall trend is upward, the stock price is likely to increase tomorrow.  It will serve as the hypothesis testing rule. It is to be determined how frequently the price rise predicted by the hypothesis testing is the same as the actual price rise for the next day.  It is necessary to repeatedly verify the hypothesis testing rule's percentage accuracy. T-test can be used to perform hypothesis testing if the sample size for testing is lesser than 30 samples. Z-Test can be used to validate null and alternate hypothesis testing for samples larger than 30.  Step 7: The same step is performed for the moving averages of 13 days, 20 days, 100 days, and 200 days.  Step 8: Exponential Moving Average is used to recreate the five different models created using Simple Moving Average.  Step 9: ARIMA Time series modelling is used to create an additional five different models.  The construction of all 15 models, as seen above, will be used to forecast day trading in the stock market.  When the majority of the 15 various models or all of them move in the same direction, a choice on whether to purchase or sell the stock must be made. What works in the Indian stock market must be proven with evidence. Any stock on the stock market can utilise the same procedure to forecast buy or sell choices, which is helpful. |
| Support needed from Program office | Program Office |
| References | [1] Zelia Cazalet. and Thierry Roncalli (October 2014), Facts and Fantasies About Factor Investing  [2] David Blitz and Milan Vidojevic ,The Characteristics of Factor Investing  [3] Andrew Ang (06-10-2013), Chapter 14: Factor Investing  [4] An EDHEC-Risk Institute Publication (March 2020),Factor Investing in Liability-Driven and Goal-Based Investment Solutions  [5] Scott N. Pappas, CFA; Joel M. Dickson, Ph.D. (April 2015), Factor-based investing  [6] *Douglas M. Grim, CFA; Scott N. Pappas, CFA; Ravi G. Tolani; Savas Kesidis* (April 2017), Equity factor-based investing: A practitioner’s guide  [7] An EDHEC-Risk Institute Publication (September 2020), The EDHEC European ETF, Smart Beta and Factor Investing Survey  [8] An EDHEC-Risk Institute Publication (September 2018), The EDHEC European ETF and Smart Beta and FactorInvesting Survey 2018  [9] An EDHEC-Risk Institute Publication (September 2019), The EDHEC European ETF, Smart Beta and Factor Investing Survey 2019  [10] An EDHEC-Risk Institute Publication (February 2018), Smart Beta and Beyond: Maximizing the Benefits ofFactor Investing  [11] EUGENE PODKAMINER (SUMMER 2015 Volume 24 Number 2), The Education of Beta: Can Alternative Indexes Make Your Portfolio Smarter? |