

**Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS)**

**Faculty of Information and Communication Technology (FICT)**

**PROJECT : GOLD INDICATOR(FOREX)**

Subject : MACHINE LEARNING

Department : SOFTWARE ENGINEERING

Semester : 5th

Session : FALL 21

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CMS ID : 56275

**SUBMITTED TO : PROF SANIYA ASHRAF**

Date : 28/12/2023

**Abstract:**

This project focuses on the creation of a novel Forex gold price indicator utilizing machine learning techniques, specifically the Random Forest Regressor. The indicator is trained on a comprehensive dataset encompassing various commodities, including but not limited to gold, silver, and currency pairs such as EUR/USD. The primary objective is to model and predict gold prices based on a diverse set of influencing factors, leveraging the power of the Random Forest algorithm.

The methodology involves preprocessing a multivariate dataset containing historical data for gold and related commodities. This dataset is then used to train the Random Forest Regressor, a robust ensemble learning algorithm capable of capturing intricate relationships within complex datasets. The model takes into account the interdependencies among various commodities and currency pairs, offering a holistic perspective on the factors influencing gold prices.

Results from the Random Forest Regressor demonstrate the efficacy of the developed indicator in predicting gold prices with a high degree of accuracy. The inclusion of multiple features allows for a more nuanced understanding of the intricate dynamics affecting the precious metals market.

This research contributes to the growing field of algorithmic trading and financial market analysis by presenting an innovative approach to forecasting gold prices. The developed indicator holds potential applications for traders, investors, and financial analysts seeking enhanced insights into the behavior of gold prices in the context of broader commodity market trends.

**1. Introduction:**

As in today’s world forex market has an important role. So, in consideration to that we thought to make an indicator that should be able to predict the price of a famous commodity in forex market, Gold.

The objective of making this indicator was to use the machine learning techniques to predict the commodity price.

By using this indicator one can take help and observe where the market is heading according to some specific time frame.

Currently there are many algorithms in market using various techniques but we observed that there are very little amount of indicators (free to use) using ML algorithms. So, we decided to build it using a ML model called RandomForestRegressor.

**2.Methodology:**

In this project, I made a computer program to predict gold prices using a smart algorithm called RandomForestRegressor. I picked this algorithm because it's really good at figuring out patterns in data, especially when things get a bit complicated. It uses a bunch of decision trees, which work together to give accurate predictions without getting confused easily. I chose RandomForestRegressor because it's flexible, handles tricky situations well, resilient to outliers and is easy to use. I used a dataset from Kaggle that had not just gold prices but also info on other things like EUR/USD and silver. This helped me understand how different things affect each other in finance. I used Python and a library called scikit-learn to make the program. This project shows that RandomForestRegressor is a great choice for predicting gold prices and understanding complex relationships in financial data.

**3.Results:**

We found our model successful with an R2 score of above 0.98 which indicate its success.

4. **Conclusion:**

Although we have made a model but one cannot solely trade gold completely relying on this indicator because this indicator will be used along with RSI and Bollinger bands to generate Buy and Sell signals.

For future we will have to link this to a broker that will provide real time data to our mode so that we can check the accuracy of our model in real time. We did not connect it with broker because it has to use API’s to connect and fetch data and that needs subscription.

**5.Work division:**

Most of the work we did we did it in library sitting next to each other and but if we talk specifically about the dataset analysis it was done by AHMED ILYAS, model selection research was done by Alyan khan and M Shoaib did the model implementation in python.

**Rubrics for Problem Based Learning (PBL)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Performance Indicator** | **Unsatisfactory** | **Average** | **Good** | **Excellent** | **Score** |
| **Understands the Problem (15 Marks)** | Doesn't understand enough to get started or make progress. | Understands enough to solve part of the problem. | Understands the problem. | Understands the problem and Identifies the approach before starting the problem. |  |
| **0-3** | **4-7** | **8-11** | **12-15** |
| **Uses Information for Problem Solving (10 Marks)** | Used wrong information in trying to solve the problem. | Used not all of the relevant information  in trying to solve the problem. | Used all relevant information in trying to solve the problem. | Used implied information not readily  apparent in trying to solve the problem. |  |
| **0-1** | **2-4** | **5-7** | **8-10** |
| Methodology/Approach  (25 Marks) | Unable to solve the problem or the attempted solution shows inadequate knowledge of engineering, science and mathematics. | Demonstrates the ability to apply some principles of engineering, science and mathematics to solve the problem but not correctly. | Demonstrates the ability to correctly apply principles of engineering, science and mathematics to solve the problem with some guidance. | Demonstrates the ability to correctly apply all the appropriate principles of engineering, science and mathematics to solve the problem. |  |
| 0-5 | 6-11 | 12-18 | 19-25 |
| Results, Analysis and Conclusion  (25 Marks) | Fails to interpret the results, analysis and conclusion. | Demonstrates the results, however, the analysis and conclusion are not provided. | Demonstrates the clear results, analysis and conclusion. | Demonstrates the detailed results, analysis, conclusion and future recommendations. |  |
| 0-5 | 6-11 | 12-18 | 19-25 |
| **Report Writing**  **(10 Marks)** | The document has poor organization and formatting with many grammatical and spelling errors. The appropriate format is not followed. | The document has some organization and formatting with few errors. The appropriate format is followed in few sections of the document. | The document is organized, properly formatted, and error free. The appropriate format is followed. | The document is well organized, properly formatted, and error free. The appropriate format is precisely followed. |  |
| **0-1** | **2-4** | **5-7** | **8-10** |
| **Presentation and Viva** **Voce**  **(15 Marks)** | Presentation slides have poor organization and formatting. Student is not prepared and making no attempts to engage audience. Student cannot answer to questions. | Presentation slides have some organization with appropriate graphics and formatting. Student is somewhat prepared and making limited attempts to engage audience. Student feels difficulty to answer questions. | Presentation slides are organized and properly formatted. Student is prepared and delivers presentation while engaging the audience. Student responds to all questions properly. | Presentation slides are well organized and properly formatted. Student is well prepared and delivers clear and continuous presentation while effectively engaging the audience. Student responds to all questions properly and accurately. |  |
| **0-3** | **4-7** | **8-11** | **12-15** |
| **Total Marks obtained out of 100** | | | | | X |

Marks obtained out of Y = (X/100)×Y ; Y is the total marks of PBL

Instructor Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_