

PROJECT TITLE

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18CSC305J - ARTIFICIAL INTELLIGENCE

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BONAFIDE CERTIFICATE

Certified that Mini project report titled “**Gold Price Prediction System**” is the bona fide work of **Yash Kumar (RA2111031010056), Yashi Jain(RA2111031010058), Pranav Khattar(RA2111031010046)** who carried out the minor project under my supervision. Certified further, that to the best of my knowledge, the work reported herein does not form any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

We predict future gold rates supported twenty two market variables victimization machine learning technique . One machine learning algorithm, random forest regression were used in analyzing these knowledge.

Historically, gold was used for supporting trade transactions around the world besides alternative modes of payment.

Various states maintained and increased their gold reserves and were recognized as rich and progressive states. In present times, precious metals like gold area unit control with central banks of all countries to make sure re-payment of foreign debts, and conjointly to control inflation.

Moreover, it conjointly reflects the money strength of the country.

Besides government agencies, varied transnational firms and people have conjointly invested with in gold reserves.

In ancient events of Asian countries, gold is in addition presented as gifts/souvenirs and in marriages, gold ornaments are conferred as gift in Republic of India

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ABBREVIATIONS

GPPS	Gold Price Prediction System
LSTM	Long Short Term Memory
ETF	Exchange Trade Fund
API	Application Programming Interface
MAE	Mean Absolute Error
MSE	Mean Squared Error
EDA	Exploratory Data Analysis

CHAPTER 1

INTRODUCTION

Investing in gold has developed over a amount of your time in conventional forms by buying jewellery or through modern strategies, either by buying gold coins and bars (which area unit already accessible in scheduled banks).Historically, gold had been used as a sort of currency in various components of the planet as well as USA . In recent times also, gold has maintained its worth and has been used as a means for assessing the monetary strength of a rustic. Big investors have conjointly been interested in this valuable and invested vast amounts in it. Recently, rising world economies, like China, Russia, and India are massive buyers of gold, whereas USA, South Africa, and Australia area unit among the large vender of this goods .

Chinese and Indian traditional events conjointly have an effect on the worth of the gold. in this time more money is poured for purchase of this goods Small investors conjointly realize this goods for safe investment rather than alternate investment choices, that bear in-built investment risks. Internal monetary conditions of the aforementioned countries play an important role for setting spot rates for gold. Gold is another plus that is being thought-about as a lovely investment avenue by several investors thanks to its increasing worth and therefore the space of usage.

CHAPTER 2

LITERATURE SURVEY

Gold is that the alone and that retains its worth even through the political and economic. downturn. The gold values unit of measurement usually directly connected to different resources. Future gold worth forecast is that the investors' alert mechanism thanks to unpredictable market risk. Therefore, precise prognostication of gold prices is needed to predict the market patterns[6]. several machine intelligent techniques for gold prognostication applications square measure noted over the past decade. the link between gold value and costs of different commodities particularly petroleum has conjointly been extensively studied. however the results from these studies square measure found to be contradicting. a number of the studies on the factors influencing gold value and numerous techniques used for learning these relationships.

Some of the research papers on Price prediction are listed below:

Closing Price Prediction :

This research based on accurate prediction of stock market returns is a very challenging task due to volatile and non-linear nature of the financial stock markets. With the introduction of artificial intelligence and increased computational capabilities, programmed methods of prediction have proved to be more efficient in predicting stock prices. In this work, Artificial Neural Network and Random Forest techniques have been utilized for predicting the next day closing price for five companies belonging to different sectors of operation

Bitcoin Price Prediction :
In this paper, we use the LSTM version of Recurrent Neural Networks, pricing for Bitcoin. To develop a better understanding of its price influence and a common view of this good invention, we first give a brief overview of Bitcoin again economics

House Price Prediction:
This research is carried out to analyze the relevant attributes and the most efficient models to forecast the house prices. The findings of this analysis verified the use of the Artificial Neural Network, Support Vector Regression and XGBoost as the most efficient models compared to others. Moreover, our findings also suggest that locational attributes and structural attributes are prominent factors in predicting house prices. This study will be of tremendous benefit, especially to housing developers and researchers, to ascertain the most significant attributes to determine house prices and to acknowledge the best machine learning model to be used to conduct a study in this field. Used Car Price Prediction: This research based on prediction price of used cars by using Machine Learning Algorithms such as Lasso Regression, Multiple Regression and Regression trees, we will try to develop a statistical model which will be able to predict the price of a used car, based on previous consumer data and a given set of features.

We will also be comparing the prediction accuracy of these models to determine the optimal one.

CHAPTER 3

SYSTEM ARCHITECTURE AND DESIGN

1.) Data Collection:

Identify reliable sources for historical gold price data. These can include financial APIs, online repositories, or direct data feeds from exchanges.

2,) Data Preprocessing:

Clean the raw data by handling missing values, outliers, and inconsistencies. Conduct exploratory data analysis (EDA) to understand the distribution and patterns in the data. Perform data transformations like normalization or scaling to prepare the data for modeling.

3.) Feature Engineering:

Extract relevant features from the raw data that could potentially influence gold prices. These features may include economic indicators, geopolitical events, currency exchange rates, etc. Utilize domain knowledge and statistical methods to create meaningful features.

4.) Model Selection:

Choose appropriate machine learning algorithms for price prediction. Common choices include linear regression, decision trees, random forests, gradient boosting, and neural networks. Consider ensemble methods or hybrid models for improved performance. Experiment with different model architectures and hyperparameters.

5.)Training:

Split the pre processed data into training and testing sets. Train the selected models on the training data. Optimize model parameters using techniques like cross-validation or grid search.

6.)Evaluation:

Evaluate model performance using appropriate metrics such as mean absolute error, mean squared error, or accuracy. Compare the performance of different models to select the best performing one. Conduct sensitivity analysis to assess the robustness of the model.

7.) Deployment:

Once a satisfactory model is trained, deploy it into a production environment. Expose the model through an API endpoint to accept input data and return predictions. Implement monitoring and logging mechanisms to track model performance and health over time. Integrate the prediction system with user interfaces or other applications as needed.

8.) Feedback improvements. Loop:

Implement a feedback loop to continuously improve the model over time. Collect user feedback and monitor model performance in production. Periodically retrain the model with new data and incorporate any necessary updates .

CHAPTER 4

METHODOLOGY

1.) Problem Definition:

Clearly define the problem statement, including the time horizon for predictions (e.g., short-term, long-term) and the target variable (gold price).

2.) Data Collection:

Gather historical gold price data from reliable sources such as financial databases, APIs, or online repositories. Collect supplementary data such as economic indicators, geopolitical events, currency exchange rates, etc., which may influence gold prices.

3.) Data Preprocessing:

Handle missing values, outliers, and inconsistencies in the data. Normalize or scale the data to ensure consistency across features. Split the data into training, validation, and testing sets.

4.) Feature Selection/Engineering:

Conduct exploratory data analysis (EDA) to understand the relationships between features and the target variable. Select relevant features that have a significant impact on gold prices. Engineer new features based on domain knowledge and statistical insights.

5.) Model Selection:

Choose appropriate machine learning algorithms for the prediction task, considering factors like interpretability, complexity, and performance. Experiment with different models such as linear regression, decision trees, random forests, gradient boosting, and neural networks. Consider ensemble methods or hybrid models for improved accuracy and robustness.

6.) Training:

Train the selected models using the training dataset. Optimize model hyperparameters using techniques like cross-validation or grid search. Validate model performance on the validation dataset and iterate if necessary.

7.) Evaluation:

Evaluate model performance using appropriate metrics such as mean absolute error (MAE), mean squared error (MSE), or accuracy. Compare the performance of different models to select the best performing one. Conduct sensitivity analysis to understand the impact of different factors on model predictions.

8.) Deployment:

Deploy the trained model into a production environment, either on-premises or in the cloud. Expose the model through an API endpoint to accept input data and return predictions. Implement monitoring and logging mechanisms to track model performance and health over time.

CHAPTER 5

CODING AND TESTING

CHAPTER 6

SCREENSHOTS AND RESULTS

Gold Trend Prediction :

Gold Trend Prediction

	Open	High	Low	Close	Volume	Dividends	Stock Splits
2022-06-03T00:00:00	1,867.6000	1,871.8000	1,845.4000	1,845.4000	53	0	0
2022-06-06T00:00:00	1,849.0000	1,854.1000	1,839.2000	1,839.2000	142	0	0
2022-06-07T00:00:00	1,836.9000	1,851.6000	1,835.0000	1,847.5000	1168	0	0
2022-06-08T00:00:00	1,844.8000	1,855.0000	1,844.4000	1,851.9000	218	0	0
2022-06-09T00:00:00	1,846.1000	1,850.1000	1,837.9000	1,848.8000	159	0	0
2022-06-10T00:00:00	1,842.7000	1,875.6000	1,823.0000	1,871.5000	1490	0	0
2022-06-13T00:00:00	1,873.8000	1,873.8000	1,818.7000	1,828.0000	127	0	0
2022-06-14T00:00:00	1,825.0000	1,825.5000	1,805.3000	1,809.5000	536	0	0
2022-06-15T00:00:00	1,814.1000	1,839.0000	1,810.8000	1,815.3000	538	0	0
2022-06-16T00:00:00	1,835.8000	1,838.7000	1,816.3000	1,823.1000	67047	0	0

Dataset Information:

[illegible]

CHAPTER 7

Data Virtualization :



Monthly Prediction :



Accurate prediction with 99.69% Accuracy :

CHAPTER 8

	Predictions
2022-06-16T00:00:00	1,788.1840
2022-06-17T00:00:00	1,783.4335
2022-06-18T00:00:00	1,850.6448
2022-06-19T00:00:00	1,749.3807
2022-06-20T00:00:00	1,983.8700
2022-06-21T00:00:00	1,838.4198
2022-06-22T00:00:00	1,802.4839
2022-06-23T00:00:00	1,788.7821
2022-06-24T00:00:00	1,895.0198
2022-06-25T00:00:00	1,785.3170

Daily Gold Prices Index :



CHAPTER 9

CONCLUSION AND FUTURE ENHANCEMENTS

This study by using machine learning algorithms to accurately predict the gold prices and when to sell them and purchase them. This research was done in order to clarify the gold ETF price predictions using machine learning using Python. The research was carried out for data between April 2020 and Jan 2022.

The results on proposed model is as per the following:

- 1)It is concluded that machine learning algorithms with Random Forest analysis are very useful in gold price prediction.
- 2)It is concluded that, the model's R-square is 97 percent. R-squared is usually 0 to 100 per cent. A score close to 100 per cent indicates that the Gold ETF prices are well explained by the given model.
- 3)Results show that proposed Random forest method-machine learning beats customary and current predicting models .

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