GLOBAL ACADEMY OF TECHNOLOGY

Department of Information Science & Engineering

Mini Project Presentation

Gold Stock Prediction

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Agenda

1. **Overview / Background**
2. **Problem Statement**
3. **Motivation**
4. **Objectives**
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6. **Project Requirements**
7. **System Architecture**
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Overview / Background

1. Historical Significance:
   - Gold is a valuable commodity and an essential part of financial markets.

2. Factors Affecting Prices:
   - Global economy, currency changes, and geopolitical events influence gold prices.

3. Importance of Prediction:
   - Accurate predictions help investors, businesses, and governments make better decisions.

4. Role of Data and Technology:
   - Historical price data and machine learning are used to forecast price trends.

5. Project Aim:
   - To develop a system predicting future gold prices for effective investment decisions.

Objectives

1. Prediction of Gold Stock Prices:
Build a machine learning model to predict gold stock prices using historical stock market data.

2.Performance Evaluation:
Evaluate the model using metrics such as Mean Squared Error (MSE).

3.Visualization of Stock Trends:
Visualize both historical and predicted stock price trends using interactive graphs for better understanding.

4.Forecast Future Stock Prices:
Forecast gold stock prices to aid in strategic investment planning.

Motivation

1.Economic Significance of Gold

2.Technological Advancements in Machine Learning

3.Growing Investor Interest

4.Interactive graphs and visualizations

5.Real-World Applications

Literature Review

Literature Review

Author	Title	Journal	Year	Approach	Key Findings
Nandini Tripurana, Binodini Kar, Sujata Chakravarty, Bijay K. Paikaray, Suneeta Satpathy	Gold Price Prediction using Machine Learning Techniques	Published in International Standard Industrial Classification of All Economic Activities (ISIC)	2022	Used 22 market variables and machine learning techniques, including Random Forest Regression, to predict daily gold prices..	Ensembled methods like Random Forest achieved high accuracy, effectively capturing complex patterns in gold price trends
A Sivasangari, R Deepa, K Geetha Rani, R Surendran, T Tamilvizhi	High accurate gold rate prediction using random forest regression algorithm	7th IET Smart Cities Symposium	2023	Use Random Forest Regression with features such as day of the year, month, moving averages, and lagged prices.	Random Forest Regression showed high predictive accuracy and effectively captured non-linear relationships in gold price data.
Rutuja Mahajan, Pranjal Patil, Deptee Chikmurge, Sunita Barve	Forecasting Gold Price using Ensemble based Machine Learning Approach	2023 International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSES)	2023	Use ensemble machine learning models such as Random Forest, Gradient Boosting, and XGBoost to predict gold prices.	XGBoost algorithm achieved the lowest prediction error, proving to be the most accurate.

Author	Title	Journal	Year	Approach	Key Findings
Ran Kong	Machine Learning Models for Gold Price Prediction: A Comparative Analysis and Evaluation	Highlights in Business Economics and Management	2024	Compare multiple models (Linear Regression, Random Forest, SVM, and LSTM) using R^2 Score, RMSE, and MAE for evaluation.	Random Forest outperformed traditional regression models, but LSTM excelled in capturing long-term trends.
JhansiRani Ganapa, Sudheer Choudari, Madhava rao K	Gold Price Prediction Using Random Forest Regression	Educational Administration: Theory and Practice	2024	Implement Random Forest Regression using technical indicators like Simple Moving Average (SMA) and Exponential Moving Average (EMA).	The Random Forest model demonstrated excellent performance for short-term predictions.

Problem Statement

Problem Statement

"Predicting gold prices is challenging due to their dependence on various economic and global factors. This project develops a reliable machine-learning model, using Random Forest Regression to predict gold prices."

Project Requirements

Hardware / Software Requirements Identified

Hardware Requirements:

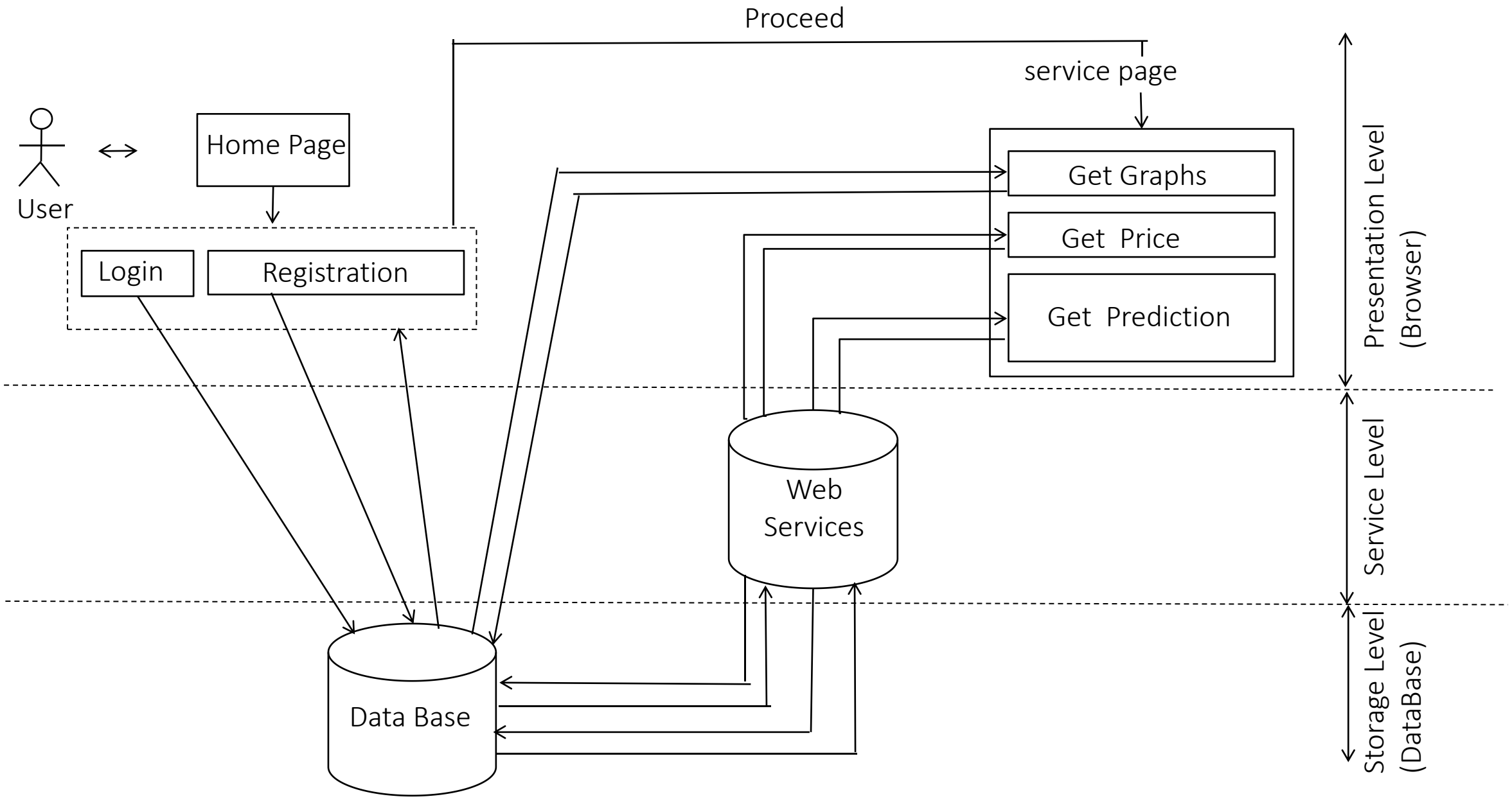
- Processor: Intel i5
- RAM: Minimum 8 GB
- Storage: At least 256 GB SSD
- Internet Connection: Stable and high-speed internet for data retrieval and library installation

Software Requirements:

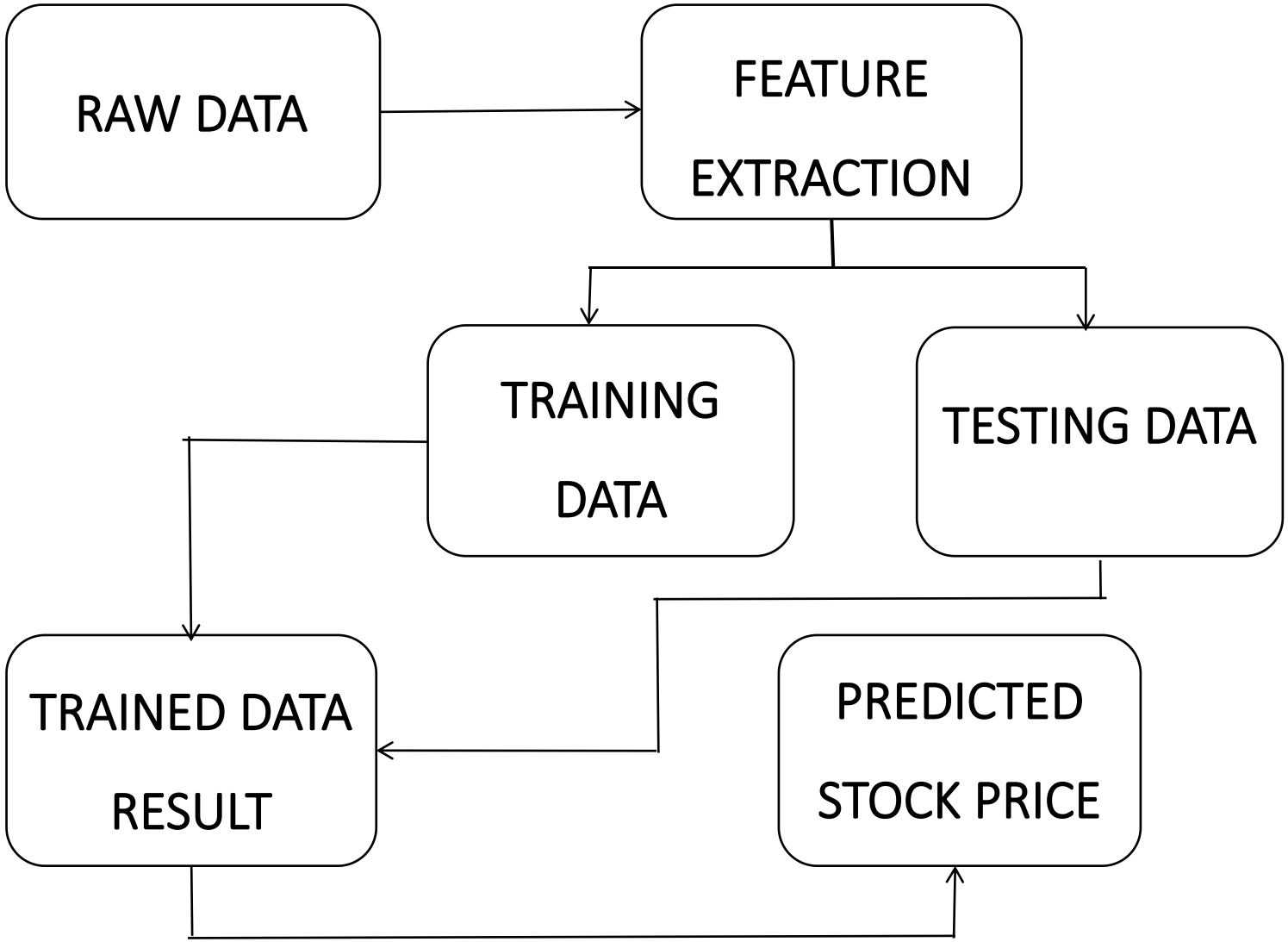
- Operating System: Windows 11
- Programming Language: Python
- IDE/Code Editor: VS Code
- Machine Learning Libraries:Pandas, NumPy, Matplotlib
- Data Source: Historical gold price datasets from Yahoo Finance

System Design

System Architecture



Data Flow Diagram



Implementation

Modules

sqlite3

yfinance

pandas

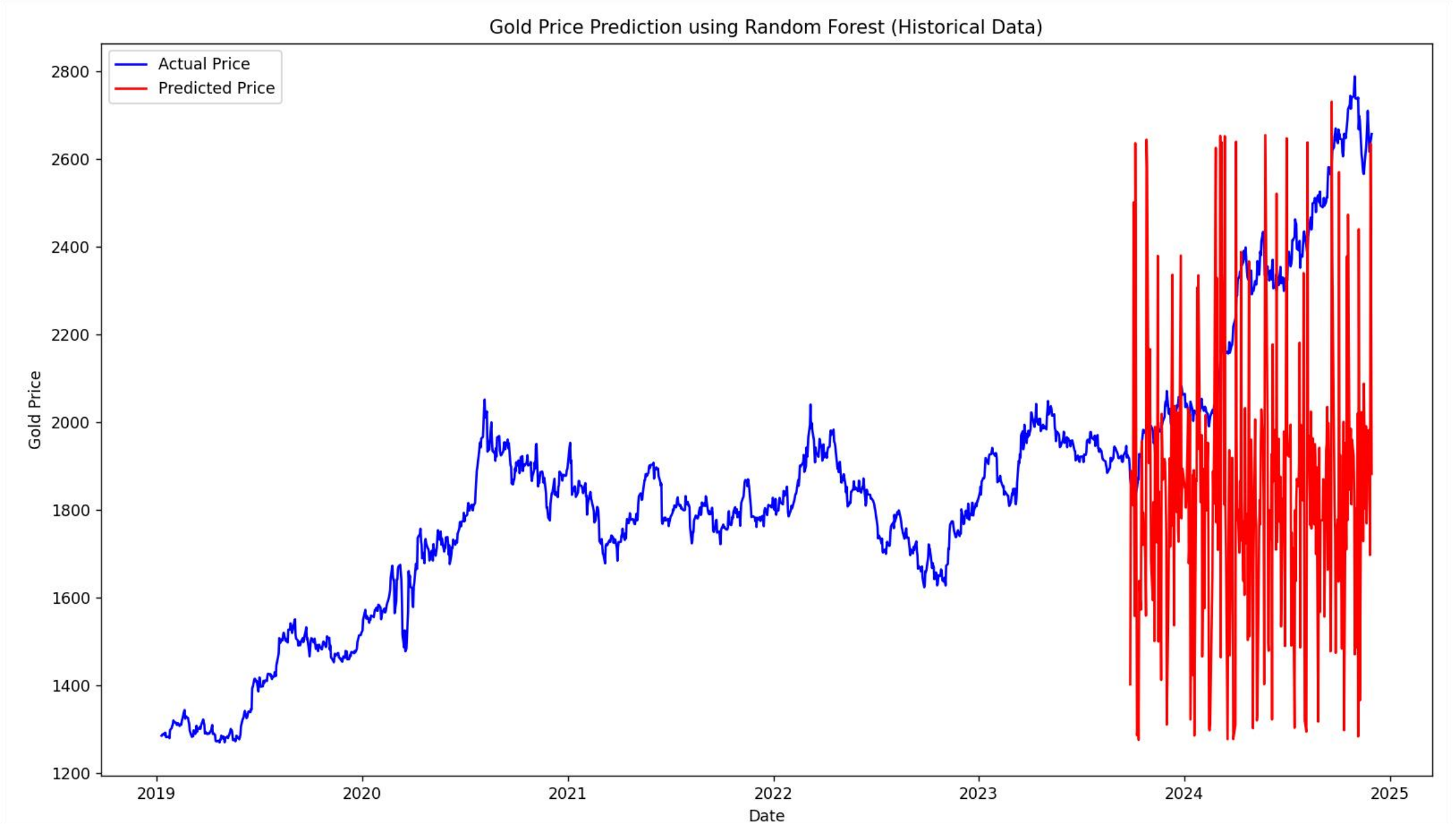
matplotlib.pyplot

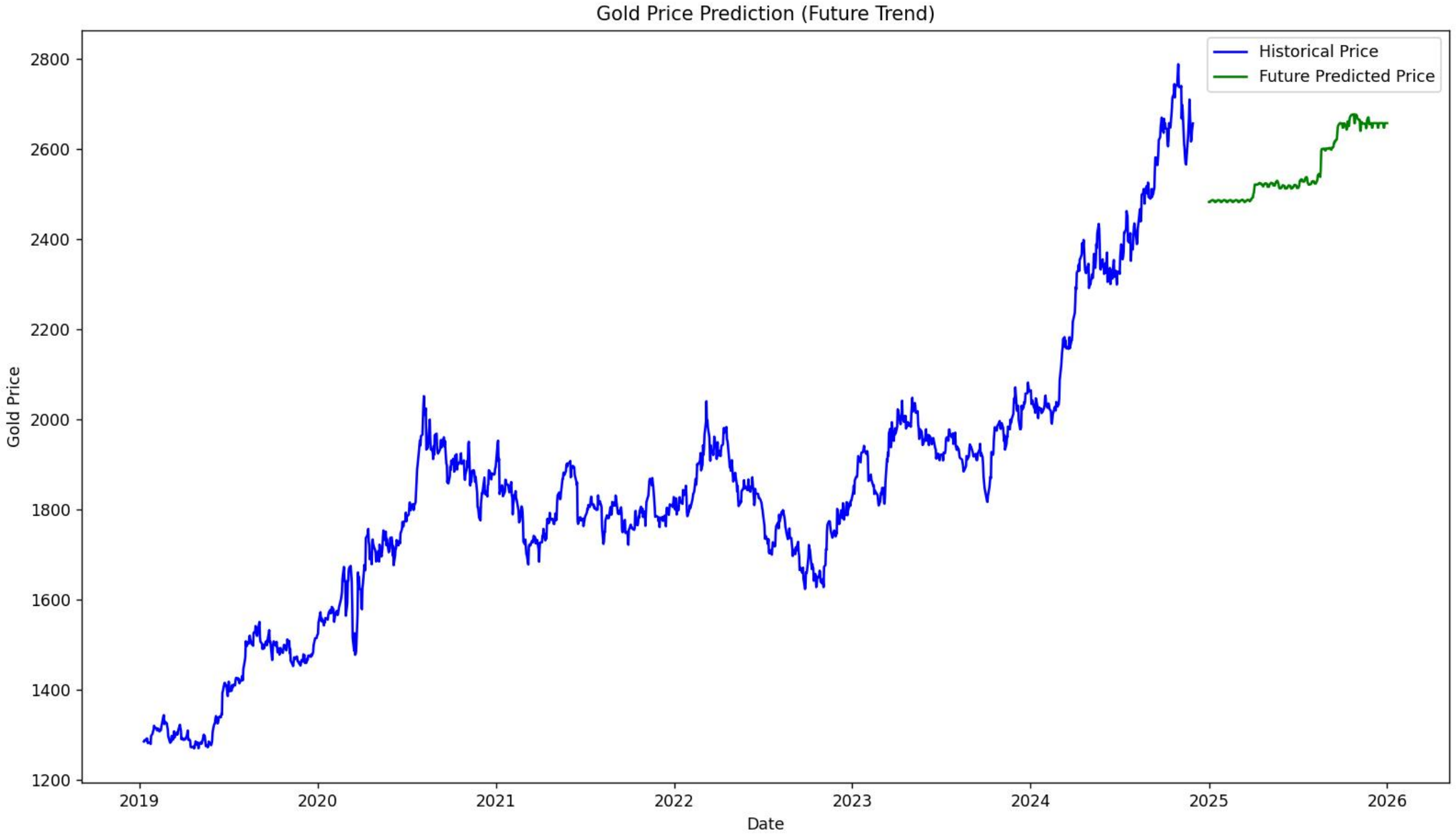
sklearn.model_selection

sklearn.ensemble

sklearn.metrices

Snapshots


Gold Price Prediction using Random Forest (Historical Data)
Actual Price
Predicted Price
Gold Price
2800
2600
2400
2200
2000
1800
1600
1400
1200
2019
2020
2021
2022
2023
2024
2025
Date


Gold Price Prediction (Future Trend)
Historical Price
Future Predicted Price
Gold Price
Date
2800
2600
2400
2200
2000
1800
1600
1400
1200
2019
2020
2021
2022
2023
2024
2025
2026

```
1.Register
2. Login
3. Exit
Select an option: 2
Enter your username: user
Enter your password: user
Welcome, user!
Enter the start date (YYYY-MM-DD): 2019-01-01
Enter the end date (YYYY-MM-DD): 2024-12-01
Fetching gold price data...
```

```
        Date  Predicted_Price
0 2025-01-01      2482.500005
1 2025-01-02      2482.500005
2 2025-01-03      2482.500005
3 2025-01-04      2484.456006
4 2025-01-05      2485.538005

1.Register
2. Login
3. Exit
Select an option: 3
Exiting the program. Goodbye!
```

Conclusion

This project serves as an introduction to financial forecasting systems, showcasing the power of machine learning in predicting market trends. With further enhancements, it can evolve into a valuable tool for investors and analysts seeking data-driven insights into gold price movements.

References

- Nandini Tripurana,Binodini Kar, Sujata Chakravarty, Bijay K. Paikaray,Suneeta Satpathy,"Gold Price Prediction using Machine Learning Techniques",Published in International Standard Industrial Classification of All Economic Activities (ISIC),2022.

- A Sivasangari,R Deepa,K Geetha Rani, R Surendran,T Tamilvizhi,"High accurate gold rate prediction using random forest regression algorithm",7th IET Smart Cities Symposium,2023.

- Rutuja Mahajan, Pranjal Patil, Deptee Chikmurge, Sunita Barve,"Forecasting Gold Price using Ensemble based Machine Learning Approach",International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSES),2023

- Ran Kong,"Machine Learning Models for Gold Price Prediction: A Comparative Analysis and Evaluation",Highlights in Business Economics and Management,2024.

- JhansiRani Ganapa,Sudheer Choudari,Madhava rao K,"Gold Price Prediction Using Random Forest Regression",Educational Administration: Theory and Practice,2024.

Thank you