Gold Price Prediction

Welcome to the **Gold Price Prediction** project! This project leverages machine learning to predict gold prices using historical data. Whether you're a data enthusiast, a finance professional, or just curious about gold prices, this project is for you! 🚀

📊 Project Overview

Gold prices are influenced by various factors such as stock market indices, currency exchange rates, and commodity prices. This project uses a **Random Forest Regressor** to predict gold prices based on historical data. The dataset includes features like SPX, USO, SLV, and EUR/USD, making it a comprehensive tool for financial analysis.

🛠️ Tools and Libraries Used

- **Pandas**: For data manipulation and analysis.
- **NumPy**: For numerical operations.
- **Seaborn**: For stunning data visualizations.
- **Matplotlib**: For creating insightful graphs.
- **Scikit-learn**: For building and evaluating machine learning models.

🚀 Workflow

1. Data Collection and Preprocessing

- Load the dataset using pandas.read_csv().
- Inspect the dataset using shape, describe(), head(), tail(), and info().
- Check for missing values with isnull().sum().

2. Data Analysis

- Create a **correlation heatmap** to visualize relationships between features.
- Plot the **distribution of gold prices** to understand the data better.

3. Splitting the Data

- Separate features (X) and target (Y) variables.
- Split the data into training and testing sets using train_test_split().

4. Model Training

- Train the **Random Forest Regressor** model on the training data.

5. Model Evaluation

- Predict gold prices on the test data.
- Calculate the **R Squared Error** to evaluate model performance.

🏆 Results

The **Random Forest Regressor** model achieved an **R Squared Error of 0.988**, showcasing its high accuracy in predicting gold prices. This makes it a reliable tool for financial forecasting.

🚀 How to Run

1. Clone the repository: git clone https://github.com/your-username/gold-price-prediction.git

   cd gold-price-prediction
2. Install the required libraries: pip install -r requirements.txt
3. Run the Jupyter Notebook: jupyter notebook main.ipynb
4. Follow the steps in the notebook to preprocess the data, train the model, and evaluate its performance.

💡 Why This Project?

- **Educational**: Learn how to apply machine learning to real-world financial data.
- **Practical**: Use the model to make informed decisions about gold investments.
- **Fun**: Dive into the world of data science and see the magic of predictive analytics!

🤝 Contributing

Contributions are welcome! Feel free to open issues or submit pull requests to improve the project. Let's make this project even better together! 🌟

Happy predicting! 🎉