



Title *Golden Insights: Visualizing Trends and Predicting Gold Prices*

Team members *Name 1: Berta Noguera NIA 1: 254020*

Name 2: Queralt Zamora NIA 2: 254255

Project description and expected benefits

The primary goal of this project is to leverage historical gold price data from 2010 to 2024 to perform visual analytics and predictive modeling. Key questions include:

- What are the long-term trends in gold prices? Can we predict gold prices for the following days or weeks using advanced modeling techniques? How does gold price movement correlate with broader financial indices, like S&P 500?

The project combines visual analytics and predictive modeling to uncover patterns and provide actionable insights into gold price trends. By integrating data visualization with predictive insights, we aim to:

- Support investment decision-making.
- Provide an understanding of the dynamics between gold and other financial indices.
- Offer a forecasting tool for predicting short-term gold price fluctuations.

Required data sources

- **Gold Price Regression Dataset**

Gold serves as a reliable store of value, especially during inflation, currency devaluation, and economic instability, and is a key hedge against market uncertainties. Its intrinsic value and limited supply make it less volatile than fiat currencies, while central banks hold significant reserves, emphasizing its global financial importance.

The dataset spans 2010–2024, containing time-series data on market indices, commodities, economic indicators, and forex rates, often represented by ETFs. It includes daily, monthly, and trimonthly granularities, making normalization and handling of missing values crucial preprocessing steps.

Expected results/delivery/output

Streamlit Web Application (component 1)

A user-friendly web app with all three minimum deliveries divided in the following key components:

- **Introduction Page:** Summarizing project goals, methodology, and key findings in a visually appealing format.
- **Interactive Dashboards (component 2):** Embedded Tableau dashboards to explore gold price trends, correlations with financial indices, and predictive insights. We will try to include them in the streamlit app.
- **Custom Graphics and Visualizations from ML model (component 3) :** Dynamic and static visualizations generated with Python libraries, enabling deeper analysis of the dataset based on a Trained ML model
- **References page:** A page with all credits from all references used.

Documentation Report

- A project report including problem statement, dataset overview, business questions and objectives, methodology and conclusions, and also a small manual of usage for the app in order to get a completed experience..

Visualization method

- **Exploratory Data Analysis (EDA):** For identifying trends and anomalies in gold price data.
- **Machine Learning Models:** For predictions, including regression models and time-series analysis.
- **Correlation Analysis:** To investigate the interplay between gold prices and S&P 500 index.
- **Visualization Tools:** Plotly, Matplotlib, and Seaborn libraries, also time-series line charts for historical price trends, Scatter plots and heatmaps for correlation analysis., Interactive dashboards for dynamic exploration, and final streamlit webapp.

