Final Report

🔹 Problem Statement

Cryptocurrency prices are highly volatile. Predicting short-term volatility allows traders to anticipate risk and plan investments better. This project builds a machine learning model to forecast 7-day price volatility based on market metrics.

🔹 Summary of Findings

- **Top Features**: `Return`, `Price_Range`, `MA_14`, `Liquidity_Ratio`
- Volatility patterns vary widely among coins.
- Daily returns and technical indicators significantly improve predictability.

🔹 Model Performance

Metric	Score
MAE	0.020998
RMSE	0.056805
R^2	0.2182

🔹 Visualizations

- 📈 Price trend plots for top 3 coins
- 📊 Volatility distribution & time-series
- 📉 Actual vs predicted scatter and residuals

🔹 Deliverables

- `xgboost_volatility.pkl`
- Python source code
- EDA visuals
- Project documentation