Crypto Volatility and Risk Analyzer

Infosys Springboard Virtual Internship 6.0

MILESTONE - 4

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Project Overview

Problem:

- Cryptocurrency markets are highly volatile.
- Investors lack tools to analyze:
- Risk exposure
- Portfolio allocation
- Predictive price trends.

Solution

VolatilityIQ integrates:

- Real-time crypto data
- Volatility modeling
- Investment simulation
- Machine Learning forecasting
- Interactive dashboards

System Architecture:

- Frontend: Streamlit
- Backend: Python
- Database: SQLite
- API Integration: CoinGecko
- API Visualization: Plotly
- ML Model: Linear Regression

Milestone 4 Integrations:

1. Machine Learning Improvements:

- Train/Test Split
- 7-day Forecast
- Confidence Interval
- Metrics: R^2, RMSE, MAPE
- (MAPE – Mean Absolute Percentage Error)

Technical Enhancements

- Rolling Volatility (7-day & 30-day)
- Real-time data (USD & INR)
- Interactive Plotly charts
- Dynamic portfolio analysis
- Deployment-ready structure
- Milestone 4 upgrades the system into a complete crypto risk analytics platform.

2.Portfolio Allocation:

- Multiple coin selection
- Percentage-based weights
- Combined portfolio risk

3.Investment Risk Simulation:

- User investment input
- Optimistic (+2σ) & Pessimistic (−2σ) scenarios
- Risk classification
- σ = Standard Deviation

Future Scope

- LSTM (Long Short-Term Memory) forecasting
- ARIMA (AutoRegressive Integrated Moving Average)
- VaR (Value at Risk)
- Sharpe Ratio & Portfolio Optimization
- Correlation Heatmap
- Real-time Alerts
- Cloud scaling

THANK YOU !