CryptoViz: Interactive Crypto Return Analysis and Prediction Tool

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Data Collection via Yahoo Finance

- Data Source: yfinance Python package, pull data on the Top 30 cryptocurrencies by market cap(e.g., BTC, ETH, SOL)
- Data Includes:
  - Daily Open, Close, Volume, High, Low
  - Derived metrics: log returns, volatility, moving averages
- Storage: Tabular CSV format, updated daily via scheduled Python script
- Bonus: Users can also add new coins by hand in the app (e.g., ARB-USD, DOGE-USD)

Bitcoin Open vs. Close Prices (2022–2024)

Model – ARIMA Forecasting API

- One-step-ahead forecasting using **ARIMA(p,d,q)** trained on each coin's historical Close prices

- Model selection via AIC/BIC on rolling basis or fixed window

- Forecast endpoint deployed as a **Flask API**

- Input: JSON with ticker and historical Close prices

- Output: Predicted next-day Close price with confidence interval

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Product Vision — Shiny Dashboard

- Forecast Panel:
  - User selects a coin and date range
  - Shiny app plots historical Close price
  - Sends recent price data to Flask API
  - Receives and displays next-day ARIMA forecast + confidence interval
- Correlation Panel:
  - User selects a timeframe (e.g., 7D, 30D, 90D)
  - App computes log return correlation matrix across selected coins
  - Output: Heatmap (ggplot2 or plotly) with optional numeric values overlay
- User-Driven Analysis:
  - Users can type in any coin ID to fetch and analyze new coins (e.g., "arbitrum")
  - App pulls data in real-time from Yahoo Finance and updates visuals