Macro Regimes-Based Asset Allocation

1. **Project Summary**
   Developed a regime-aware asset allocation framework by leveraging macroeconomic indicators to segment economic environments and adapt investment strategies accordingly.

2. **Data for Regime Segmentation**

Sources: FRED, Yahoo Finance

Macroeconomic Indicators:

- Descriptive: GDP growth, unemployment rate, CPI change, 10Y Treasury yield, effective Fed funds rate, corporate bond spread, industrial production index, retail sales
- Leading: PMI new orders, Leading Economic Index, consumer confidence, housing starts, oil prices, gold prices, S&P 500 returns (1–3 month rolling)
- Lagged: Unemployment rate, Fed funds rate, CPI, yield curve slope, corporate bond spread, new orders, S&P 500 returns, oil prices, retail sales, consumer confidence, housing starts

3. **Methodologies**

- Regime Detection: Applied K-Means clustering on standardized macro indicators to identify economic regimes (e.g., expansion, slowdown, recession)
- Modeling: Trained classification models (Logistic Regression, Random Forest, XGBoost) using leading indicators to predict upcoming regimes; evaluated using accuracy, precision, recall, and F1-score
- Allocation Strategy: Analyzed historical asset class performance across regimes to construct regime-specific portfolio strategies

4. **Future Improvements**

- Incorporate probabilistic regime predictions to enable dynamic asset allocation
- Enhance regime forecasting accuracy, with emphasis on identifying transition periods
- Analyze the impact of regime shifts on asset class correlations and risk dynamics
- Implement advanced portfolio optimization techniques tailored to each regime