What This Project Is About

- Simulated daily risk for a portfolio of Apple, Microsoft, Google, and Amazon using real stock price data.

Why It Matters

- Investors care about losses.
- This project shows how much you might lose in a single day, with 95% confidence.

What I Did

- Collected real market data
- Built a 4-stock portfolio
- Estimated 1-day loss risk
- Compared 3 risk models

How I Predicted Risk

📌 3 VaR Models Used:

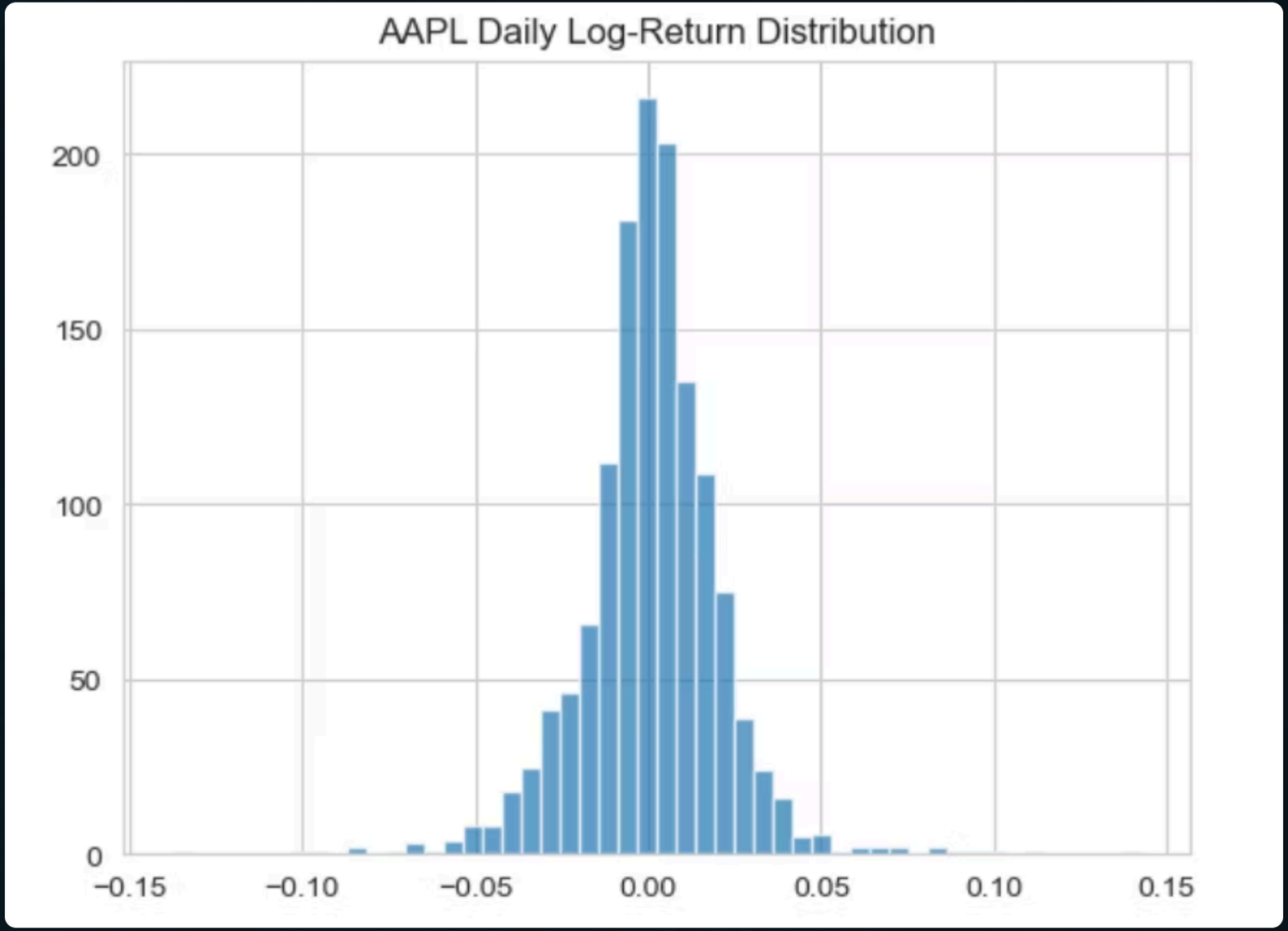
1. Normal Distribution – assumes returns are bell-shaped
2. Student's t-Distribution – captures fat tails (extreme events)
3. Historical Simulation – uses real past data to estimate risk

Key Result

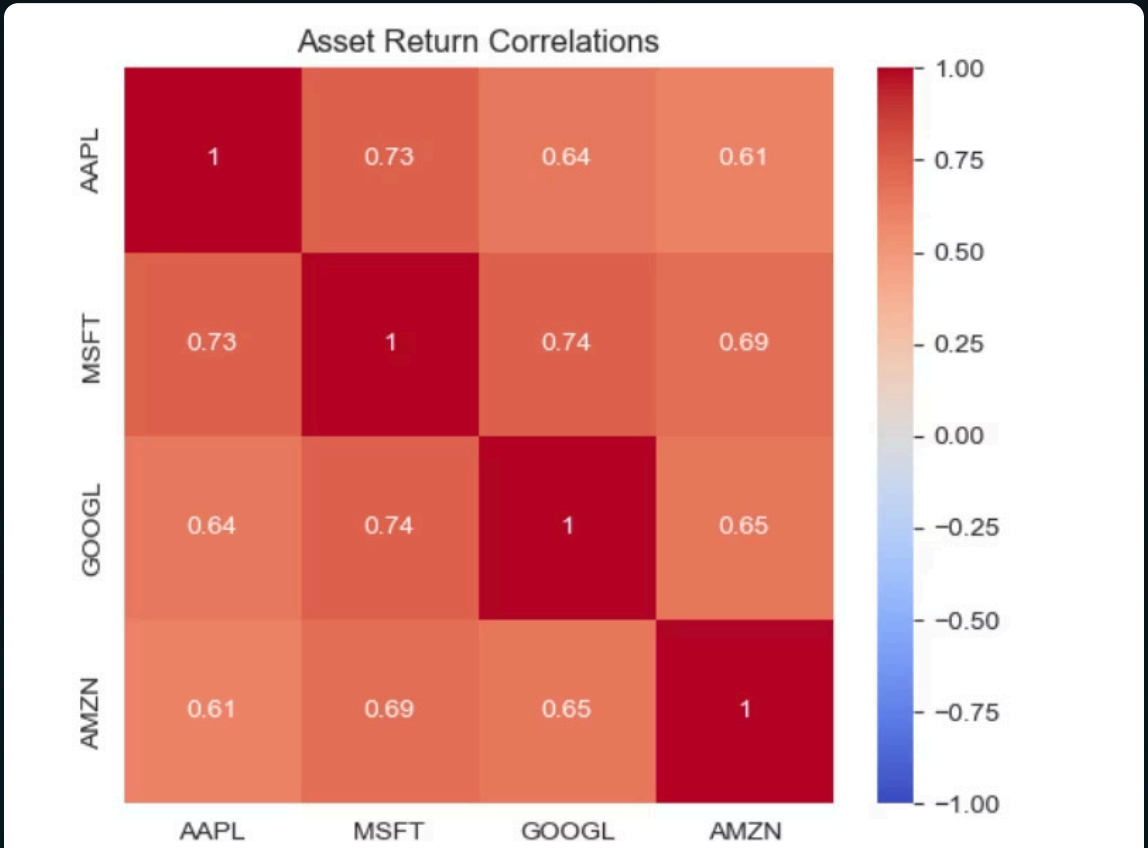
- Most days, losses stayed under 2.9%.
- Rare worst-case days could go beyond 3%.
- Different models gave slightly different VaR estimates.

What It Looks Like

-Return distribution

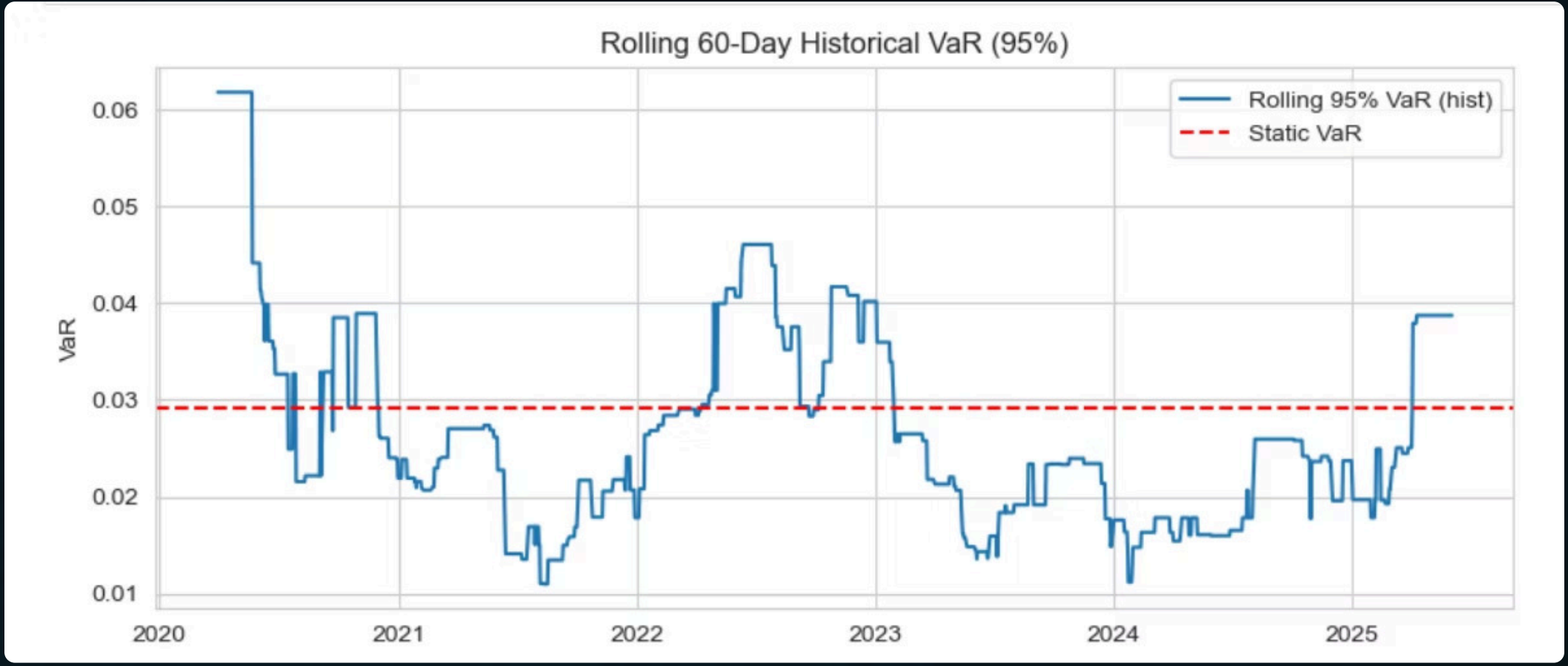


- Correlation heatmap



Weighted avg σ: 0.0209
Actual portfolio σ: 0.0181
Diversification benefit: 0.0027

- Rolling VaR chart



- Drawdown analysis

What I Learned

- Risk models depend heavily on assumptions
- Real data is not always 'normal'
- Diversification really reduces volatility
- Visual storytelling helps explain complex results

Explore the Full Project

🔗 GitHub