Triton Quantitative Trading

HIT THE BULL'S EYE

LPL Financial

UC San Diego

Triton Quantitative Trading @ LPL

2x winning strategy in QuantConnect League

2024-Q3

STRATEGY	Q3 RETURN
1 Triton Quantitative Trading	27.22 %
2 North Carolina State University	12.93 %
3 RIT Tigers	11.37 %
4 Stony Brook Applied Mathematics	10.96 %
5 Rutgers University	7.51 %

2024-Q4

STRATEGY	Q4 RETURN
1 IIT Patna Finance Club	50.63 %
2 RIT Tigers	30.04 %
3 Chinese University of Hong Kong	8.16 %
4 Triton Quantitative Trading	8.09 %
5 The Quant Club IIT BHU	5.14 %

2025-Q1

STRATEGY	Q1 RETURN
1 Triton Quantitative Trading	14.88 %
2 Imperial College London	13.54 %
3 Stony Brook Applied Mathematics	12.97 %
4 Cardinal Trading Group	6.17 %
5 Rutgers University	2.56 %

2025-Q2

STRATEGY	Q2 SHARPE
1 QUARCC	2.11
2 Triton Quantitative Trading	1.91
3 Stony Brook Applied Mathematics	0.21
4 Frankfurt School of Finance & Management	0.20
5 North Carolina State University	0.10

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QuantConnect League Team

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Software Development Engineer Intern @Amazon

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Introduction

QuantConnect: An **open-source** quantitative trading platform powered by the **Lean Engine**

- https://www.quantconnect.com/
- **Boot Camp 101** / US Equities – Free course for learning algorithmic trading and platform
- Build, backtest, and deploy your own strategies

QC League: A university trading competition hosted **quarterly** on the QuantConnect platform

- **Trading Firm** plan provided to competitors
- **$$** awarded to the **top 3** teams each quarter

Algorithm Outline

We believe that **large-cap equities** exhibiting **strong momentum** will continue to outperform in the short term. Combining this signal with **monthly rebalancing**, **efficient strategy optimization**, and **protective option hedging** can generate superior risk-adjusted returns.

Core strategy features are managed in the following files:

- Universe Selection: BasicUniverseSelectionModel
- Alpha Generation: MomentumAlphaModel
- Portfolio Construction: SortinoEfficientFrontierPortfolioConstructionModel
- Risk Management: (WIP) ProtectivePutModel
- Execution: ImmediateExecutionModel

Universe Selection – Coarse (200 Stocks)

HasFundamentalData: Ensures company has fundamental data available

(Price > 5): Eliminates penny stocks and low-priced securities

OrderByDescending(f => f.DollarVolume): Dollar Volume == **trading volume × price**

```
var selected = fundamental;
// coarse selection
selected = selected
    .Where(f => f.HasFundamentalData && f.Price > 5)
    .OrderByDescending(f => f.DollarVolume)
    .Take(this._numCoarse);
```

~4% of US listed stocks | Captures most liquid securities

Universe Selection – Fine (70 Stocks)

MarketCap Filter → reorder top 70 by highest market cap

```
// fine selection
selected = selected
    .OrderByDescending(f => f.MarketCap)
    .Take(this._numFine);
```

~1.4% of US listed stocks | Large, stable companies

Next ⇒ MomentumPortfolioConstructionModel.cs

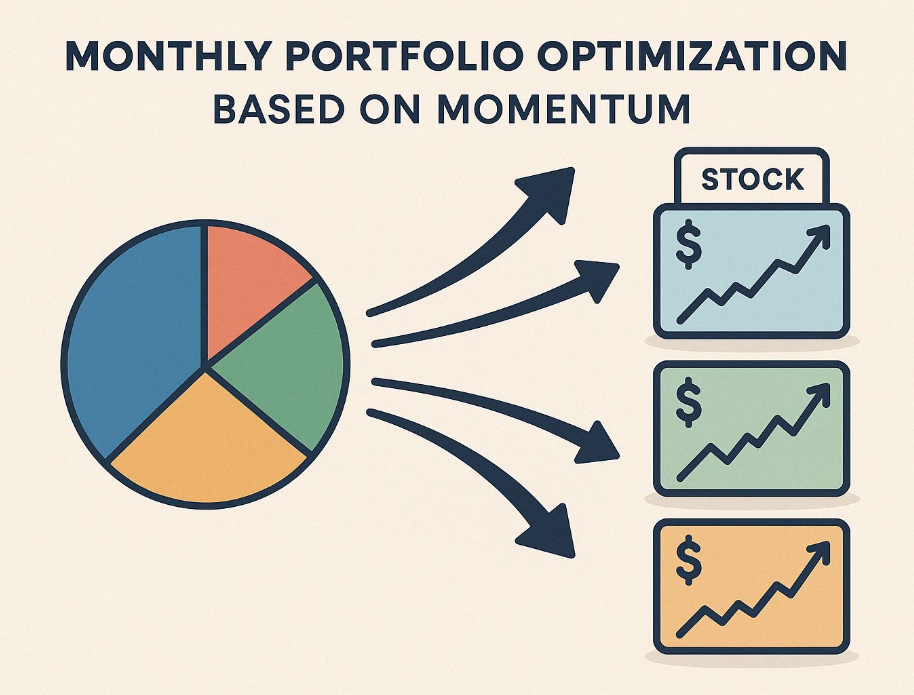
Portfolio Rebalancing

Portfolio **drift** and alpha **deterioration**

Monthly rebalancing

Top 5 Equities by **Momentum**

Optimal Weights from Portfolio Optimization



Portfolio Optimization

What is **Monte Carlo** simulation?

Why MC? Why not other choices?

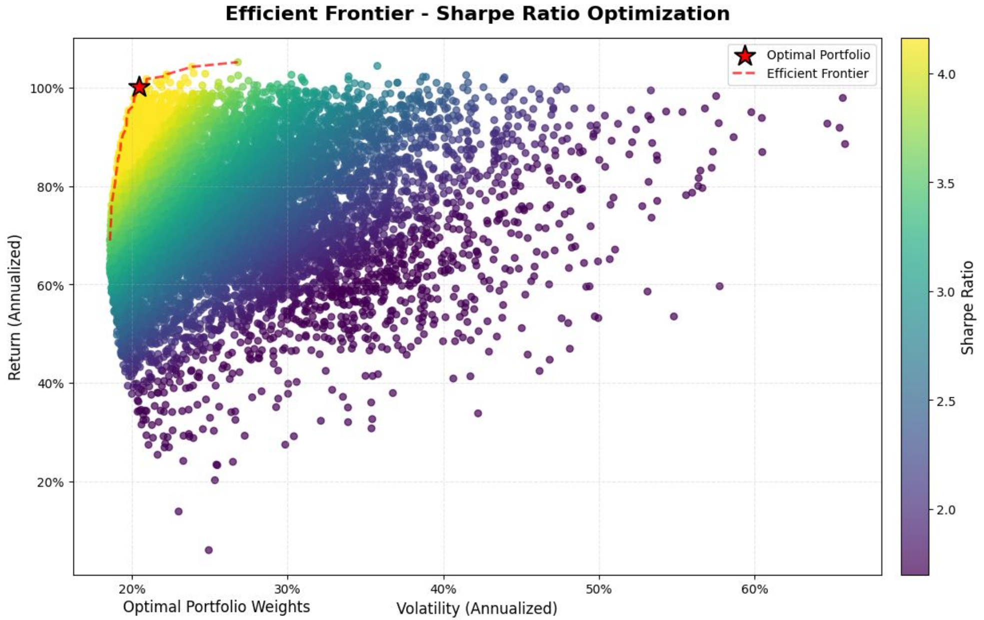
Efficient Frontier

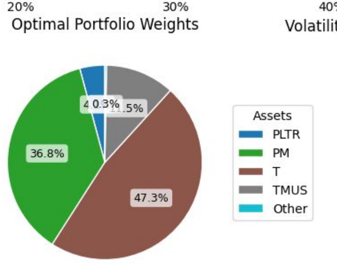
Modern Portfolio Theory

Minimal Variance Portfolio

Sortino Ratio instead of Sharpe Ratio

Theory & Empirical Performance





Metric	Value
Annual Return	100.12%
Annual Volatility	20.46%
Sharpe Ratio	4.7955
Sortino Ratio	8.6508
Optimization Method	Sharpe Ratio

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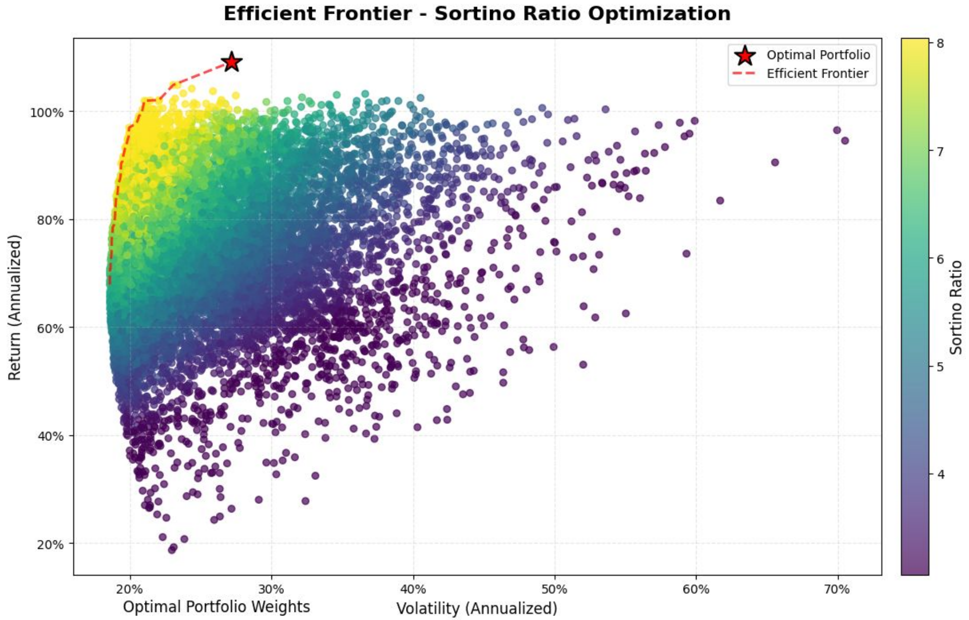
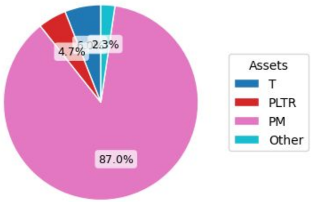


Optimal Portfolio Weights

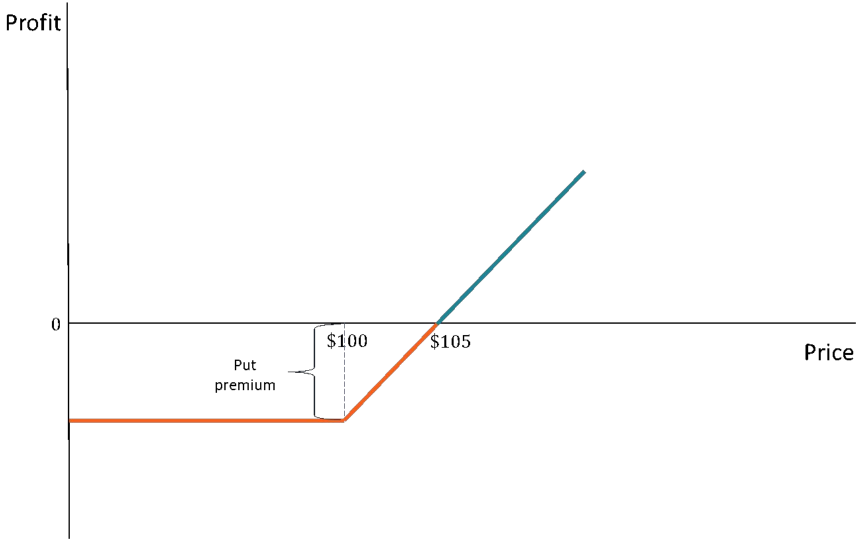


Metric	Value
Annual Return	109.04%
Annual Volatility	27.15%
Sharpe Ratio	3.9432
Sortino Ratio	9.9047
Optimization Method	Sortino Ratio

Risk Management – Protective Puts

1. Get Option Chain ⇛ 2. Filter Put Options => 3. Check Liquidity ⇛ 4. Select Best Put ⇛ 5. Scale Hedge Size ⇛ 6. Place Orders

- Options Selection:
  - 0.5% position hedge
  - 12% drawdown trigger ⇛ trade options
  - Minimum 2 months – Maximum 3 months
  - 500 Minimum daily volume
  - Maximum 5% spread



01/2019-06/2024

Overall Statistics	
Total Orders	438
Average Win	1.99%
Average Loss	-1.07%
Compounding Annual Return	47.713%
Drawdown	51.600%
Expectancy	0.829
Start Equity	1000000
End Equity	8281075.32
Net Profit	728.108%

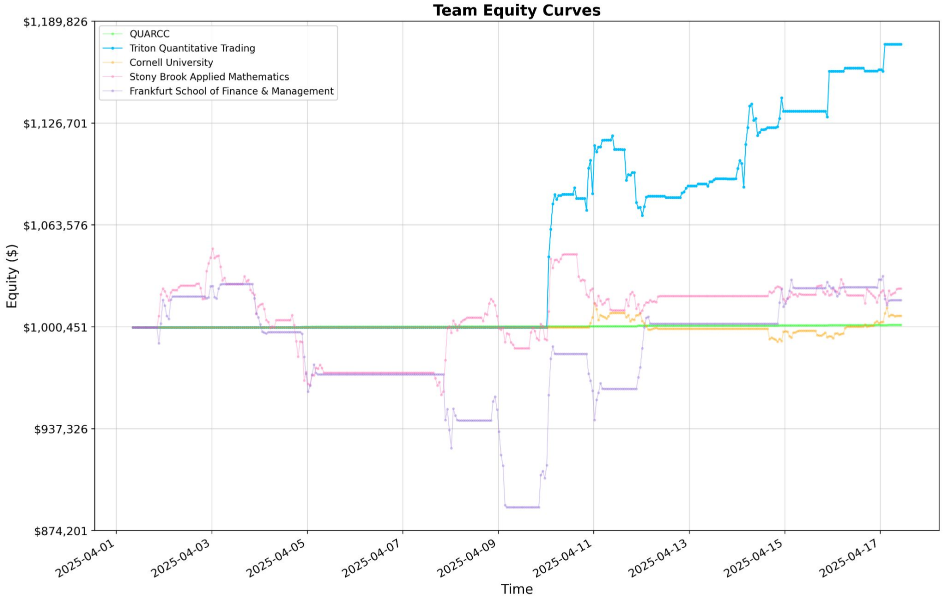
Q2– 2025 Gameplan

Pivoting to crypto - 24 x 7, way more trading opportunities!

Currently our algorithm: **17.55 % in 1 week**

First place algorithm: **0.16 % in 2 weeks**

<u>This is the first time leaderboards are determined by sharpe ratio</u>



07/2023-04/2025

Overall Statistics	
Total Orders	55678
Average Win	0.09%
Average Loss	-0.11%
Compounding Annual Return	70.961%
Drawdown	22.400%
Expectancy	0.033
Start Equity	1000000
End Equity	2572066.96
Net Profit	157.207%

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To Summarize Q1 Model:

1. **Momentum-Based** Selection & Ranking
2. Advanced Portfolio **Optimization**
3. **Dynamic** Portfolio Construction

Thank You!