The Week 1 Deep Dive gets you started with MVP to assess and backtest a real trading strategy. Then you get the foundational risk and performance metrics to consider with algo trading.

Investigate a real trading strategy with MVP

Fund managers report their holdings every month. They don't want to tell investors they lost money on meme stocks. So at the end of the month, they sell low-quality assets and buy high-quality assets, like bonds.

We might be able to take advantage of this by buying bonds at the end of the month and selling them at the beginning of the month.

Why does this work? The edge is probably too messy, too small, or just not interesting to professionals. Which makes it perfect for us.

Most people over-complicate algorithmic trading – it really can be this simple.

FlowEffects.ipynb 211.16 KB

Backtest the flow effects edge with Backtrader

A backtest is a way to test trading ideas against historic market data. It's a simulation of how the strategy might have performed in the market. Usually, traders will optimize performance metrics like Sharpe ratio by tweaking the input parameters like the lookback periods.

Unfortunately, most beginners spend all their time tweaking backtests only to find they don't work in real life. Even with out-of-sample data, cross-validation, and walk-forward analysis, backtest results are often way off. The majority of trading systems with a positive backtest are actually unprofitable.

FlowEffectsBacktrader.ipynb 64.51 KB

Use CVaR to capture tail risk

CVaR is an improvement over VaR and is considered superior by practitioners. It takes into consideration the actual shape of the distribution and quantifies the tail risk. CVaR is also known as the expected shortfall since it measures the expectation of all the different possible losses greater than VaR.

Non-professional traders and investors should consider using CVaR over VaR for their own risk management. Unfortunately, most don't.

ConditionalValueAtRisk.ipynb 297.32 KB

How To Compute Drawdown On An Investment

Drawdown is the maximum decline from peak to trough during a specific period before a new peak is reached. Every trading strategy experiences drawdowns. Computing it helps you compare the relative riskiness between assets or strategies.

Unfortunately, most people don't consider drawdown when managing their investments. Or if they do, struggle to compute it.

Drawdown.ipynb 142.94 KB

How to measure your skill as a portfolio manager with the Information ratio

Active money managers are paid based on their performance against a benchmark like the S&P 500 or Nasdaq. The Information ratio is a single number that measures their performance against that benchmark. The higher the information ratio, the better the skill.

You can use the information ratio the same way the professionals do.

Here's why you might want to.

InformationRatio.ipynb 77.22 KB

Capture your tail risk with the Omega ratio

The Omega ratio is a weighted ratio of gains and losses above a threshold return. It captures more information about returns than similar metrics like the Sharpe ratio.

It does this by adding up the area under the distribution around the threshold return. The area above the threshold measures the weight of the gains. The area below the threshold measures the weight of the losses. The Omega ratio is the positive area divided by the negative area.

If this sounds abstract, don't worry. It's straightforward in Python.

OmegaRatio.ipynb 33.28 KB

How to use the Sharpe ratio for risk-adjusted returns

The Sharpe ratio tells you the “risk-adjusted” return of an investment. In other words, “how much return do you get for every unit of risk you take.” It’s a great way to compare strategies because it normalizes their returns by risk.

If you’re investing or trading, you might want to consider the Sharpe ratio as one of your performance metrics.

SharpeRatio.ipynb 194.62 KB

How to use the Sortino ratio for risk-adjusted returns

The Sortino ratio tells you the risk-adjusted return of an investment. It is similar to the Sharpe ratio except it only considers “downside deviation”. In other words, it only uses the asset’s standard deviation of negative returns. Investors consider it a better measure of an asset’s risk-adjusted performance since positive volatility is a benefit.

If you’re investing or trading, you might want to consider the Sortino ratio as one of your performance metrics.

SortinoRatio.ipynb 120.85 KB