# Optimization Methods in Finance

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### 1 Mean-Variance Optimization

- 1. Markowitz' theory of mean-variance optimization (MVO).
- 2. MVO problem formulated as a quadratic programming problem.
- 3. Applying Markowitz' MVO model to portfolio optimization problems.

## 2 Brief mention of a few other MVO models

- 1. Large-scale portfolio optimization.
- 2. The Black-Litterman model.
- 3. Mean-absolute deviation to estimate risk.

### 3 Maximizing the Sharpe Ratio

- 1. The Sharpe ratio (i.e., reward-to-volatility ratio).
- 2. Optimal risky portfolio strategy.
- 3. Example of finding the Sharpe ratio maximizing portfolio given a set of assets with a risk-free return rate.

### 4 QP Models not covered

- 1. Returns-based style analysis.
- 2. Recovering risk-neutral probabilities from options prices.