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# Computational Investing, Part I

## *023: Sharpe Ratio*

*Find out how modern electronic markets work, why stock prices change in the ways they do, and how computation can help our understanding of them. Learn to build algorithms and visualizations to inform investing practice.*

# How To Compare Similar Portfolios?

- $\text{daily\_rets}[i] = (\text{value}[i]/\text{value}[i-1]) - 1$
- $\text{std\_metric} = \text{stdev}(\text{daily\_rets})$

# Sharpe Ratio

- Most “important” measure of asset performance.
- How well does the return of an asset compensate the investor for the risk taken?
- The higher the Sharpe ratio the better.
- When comparing two assets each with the same return, higher Sharpe ratio gives more return for the same risk.

# Sharpe Ratio

$$S = \frac{E[R - R_f]}{\sigma} = \frac{E[R - R_f]}{\sqrt{\text{var}[R - R_f]}}$$

- ⦿ Reward/Risk = How much reward are you getting for your risk?
- ⦿ `metric = k * mean(daily_rets) / stdev(daily_rets)`
- ⦿ `k = sqrt(250)` for daily returns

# Example

	Return	Sharpe	STDEV	D-down	Corr
Fund	33%	.94	0.58%	-8.67%	0.89
\$DJI	43%	.63	1.23%	-27.38%	1.00

