Exercise 6C: Alternative Weighting Schemes

BUSI 722: Data-Driven Finance II

Using the predictions from Exercise 4A and data from `merged.parquet`, compare alternative portfolio weighting approaches.

Submission

Submit a **Jupyter notebook** (`.ipynb`) containing all code, output, and charts. Use markdown cells for any written discussion.

Compare three long-only portfolio weighting approaches applied to the top-quintile predicted stocks:

1. **Equal-weighted:** $w_i = 1/n$ for top-quintile stocks.
2. **Market-cap weighted:** $w_i \propto \text{mcap}_i$ for top-quintile stocks.
3. **Inverse-volatility weighted:** $w_i \propto 1/\hat{\sigma}_i$ for top-quintile stocks, where $\hat{\sigma}_i$ is the trailing 12-month return standard deviation.

For each weighting scheme, compute monthly portfolio returns and report:

- Mean monthly return, annualized volatility, annualized Sharpe ratio
- Maximum drawdown
- Average number of stocks with weight $> 2\%$

Plot the cumulative returns of all three weighting schemes on a single chart. In a markdown cell, discuss which scheme offers the best risk-adjusted performance.