Exercise 1B: Moving Averages

BUSI 722: Data-Driven Finance II

Using the monthly dataset built in Exercise 1A, compute moving averages and evaluate their predictive power.

Submission

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

For each stock, compute the following moving averages of the monthly closing price (`close`):

1. **Short MA:** 3-month simple moving average.
2. **Long MA:** 12-month simple moving average.
3. **MA Ratio:** `close / MA_12` – the ratio of the current price to its 12-month moving average.

Then:

4. Each month, sort stocks into **deciles** by MA Ratio. Compute the equal-weighted mean return of each decile. Report the mean monthly return for each decile across all months.
5. Define a **golden cross** signal: `MA_3 > MA_12` (short MA above long MA). Each month, compute the equal-weighted mean return of stocks with a golden cross vs. stocks without. Report the return spread.
6. Create a bar chart of mean monthly returns by MA Ratio decile.