

MIS4321

**Computational Finance and
Algorithmic Trading**

Fall 2025

Lecture #6

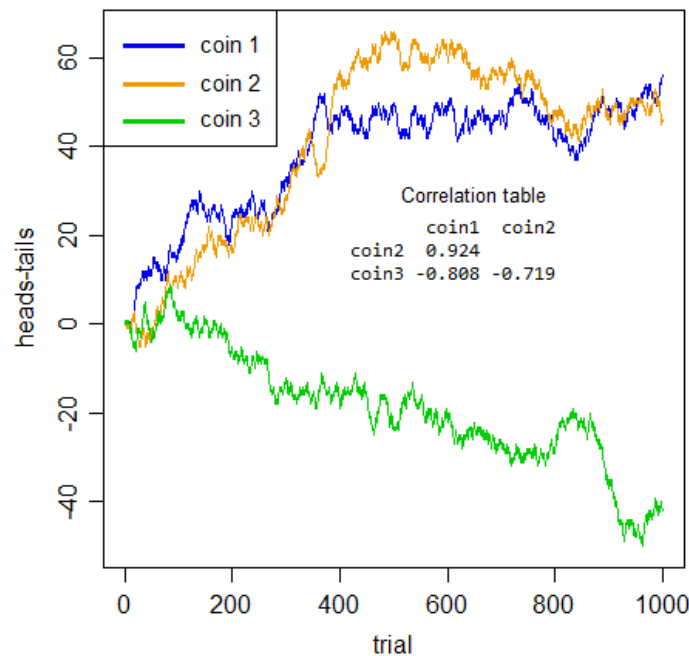
Financial Data Processing

Financial Data

- *Get data from Binance exchange market
- *Convert the data to time series
- *Calculate the volatility of time series
- *Compute correlation coefficient
- *Cointegration-test for multiple time series

Correlation of time series

Serial correlation is used in statistics to describe the relationship between observations of the same variable over specific periods. If a variable's serial correlation is measured as zero, there is no correlation, and each of the observations is independent of one another. Conversely, if a variable's serial correlation skews toward one, the observations are serially correlated, and future observations are affected by past values.



Cointegration of time series

Cointegration is a statistical method used to test the correlation between two or more non-stationary time series in the long run or for a specified period. The method helps identify long-run parameters or equilibrium for two or more variables. In addition, it helps determine the scenarios wherein two or more stationary time series are cointegrated so that they cannot depart much from the equilibrium in the long run.



Volatility of time series

Volatility is a statistical measure of the dispersion of returns for a given security or market index. It is often measured from either the standard deviation or variance between those returns. In most cases, the higher the volatility, the riskier the security.

In the securities markets, volatility is often associated with big price swings either up or down. For example, when the stock market rises and falls more than 1% over a sustained period of time, it is called a volatile market.

Next week

- **Midterm Exam**

Thank you for your participation 😊