Stochastic Processes in Quant Trading

A One-Page Introduction

What is a Stochastic Process?

A stochastic process is a mathematical way to describe how something (like a stock price) changes over time with randomness.

You can think of it as a path where each step is partly predictable, but also influenced by chance.

Why It Matters in Quant Trading

Quant traders use stochastic processes to model and simulate financial markets. This allows them to:

- Model future price movements (e.g., using Geometric Brownian Motion)
- Estimate and forecast volatility (e.g., with GARCH models)
- Simulate possible outcomes using Monte Carlo methods
- Make probability-based trading decisions

Real Use Cases

- Predicting price ranges for the next day/week
- Designing strategies that react to volatility
- Generating synthetic price paths to test strategies

In essence, stochastic processes bring mathematical rigor to trading in an uncertain world.