Project Overview

- Develop single or multi-factor models in MATLAB
- Incorporate outside startup’s data into the models
- Analyze how the data effects the predictive accuracy of our models

What are multi-factor models?

- A financial model (equation) that has multiple independent variables. The dependent variable is either an individual security (financial asset) or a portfolio of securities.
- Example:
  \[ r = b_3 \times (K_m - R_f) + (b_s \times SMB) + b_v \times HML + \text{alpha} + R_f \]
  - \( r \) is the expected return of a financial portfolio

CAPM

- The first model I made
- \( E(r) = \text{alpha} + \text{beta} \times E(R_m) \)
  - Alpha is the excess rate of returns
    - Calculated by taking the average of the difference between expected returns and actual returns
  - Beta is a coefficient for the volatility of a stock in relation to the market
    - If beta>1, then it is going to vary greater than the market. It will grow and shrink quicker than the market does

My CAPM

- This original CAPM model was just using SnP data, not Expected Snp data.
  - So, we used an algorithm to predict SnP price
  - The process is called Geometric Brownian Motion

Geometric Brownian Motion model

- The upper and lower bounds were too wide, making it so our prediction accuracy was not very good.
- We are going to add Prattle’s data to the expected SnP data to see whether or not it can improve the model