Math/Econ 411: Final Project

In this project, we want to understand the limitations of geometric Brownian motion under both physical and risk-neutral measures.

- Under the physical measure, show that the geometric Brownian motion do not work well during the market crash by conducting the hypothesis testing from 4/25/2024 to 4/25/2025. (Similar to HW5)

- I've included a sample of real market option data in 2011. Calculate the mean-squared error using Black-Scholes-Merton and fix an expiration date to get a volatility smirk pattern. You may assume the volatility σ on that date is 0.17.