Retirement Simulator

Using Monte Carlo Simulation and other visualizations

Retirement Calculator

Understanding how much money you need for retirement is difficult. There are multiple different investing strategies available, so it's hard to pick. What is the probability my retirement will run out, using traditional investment portfolios?

Using our retirement calculator, any consumer can input key variables towards retirement to calculate the probability of retirement goals using Monte Carlo simulation.

To use this tool, a consumer only needs to know :

1. Type of Investment
2. Starting Investment value
3. Their average yearly spending
4. Anticipated length of retirement

Portfolio Data

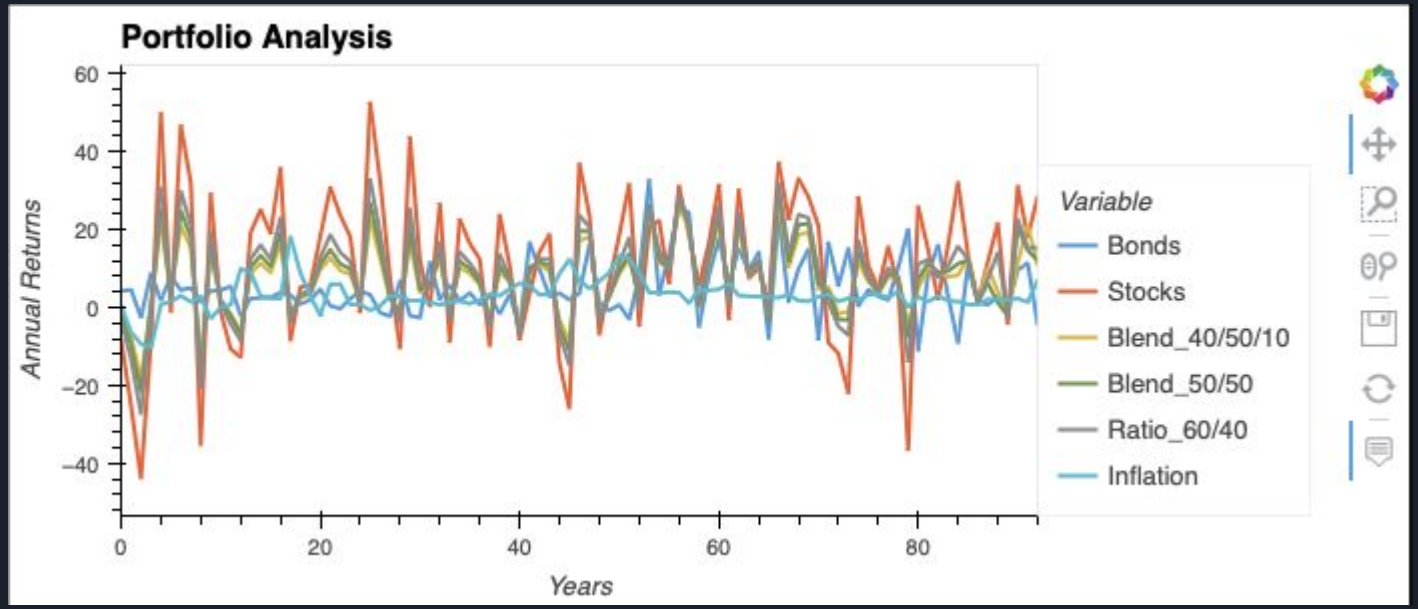
The retirement calculator uses historical data from 1928-2021,

The 5 investment types available are :

- Bonds
- Stocks (SP_500)
- Blend (40-50-10) - 40% Stocks / 50% Bonds / 10% Cash or T Bills
- Blend(50-50) - 50% Stocks / 50% Bonds
- Ratio(60-40) - 60% Stocks / 40% Bonds

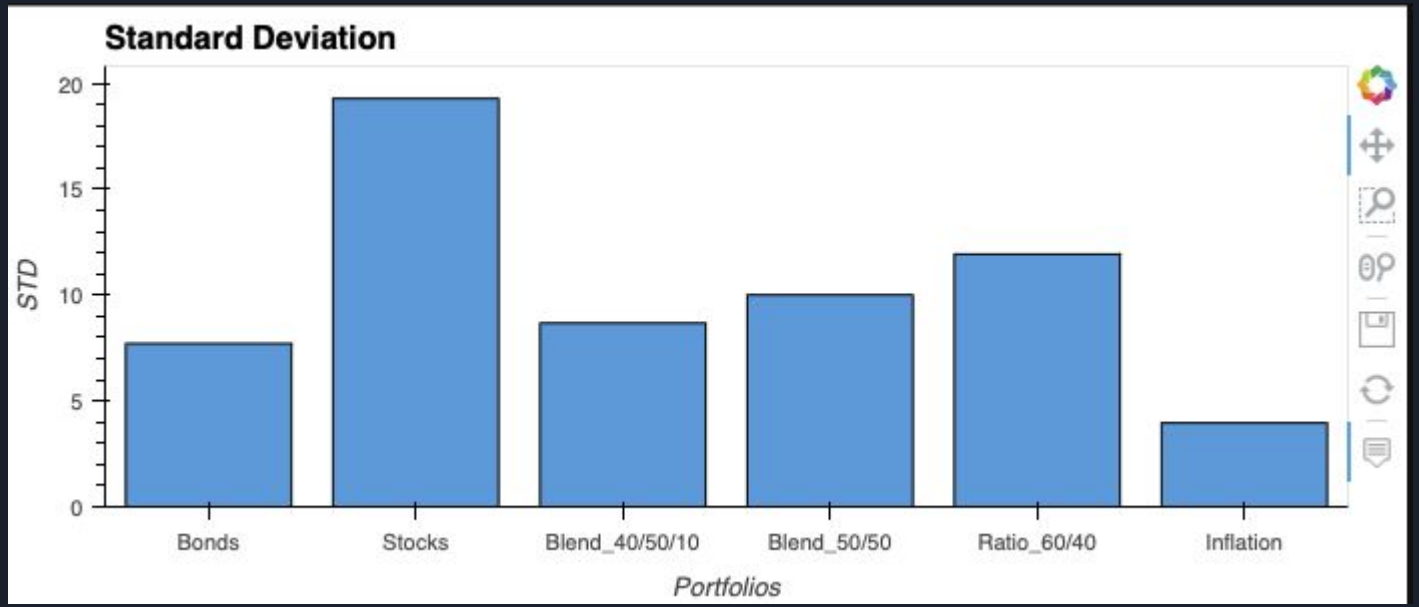
The data we used was clean, and were annualized returns of these portfolios.

Analysis of Investment types



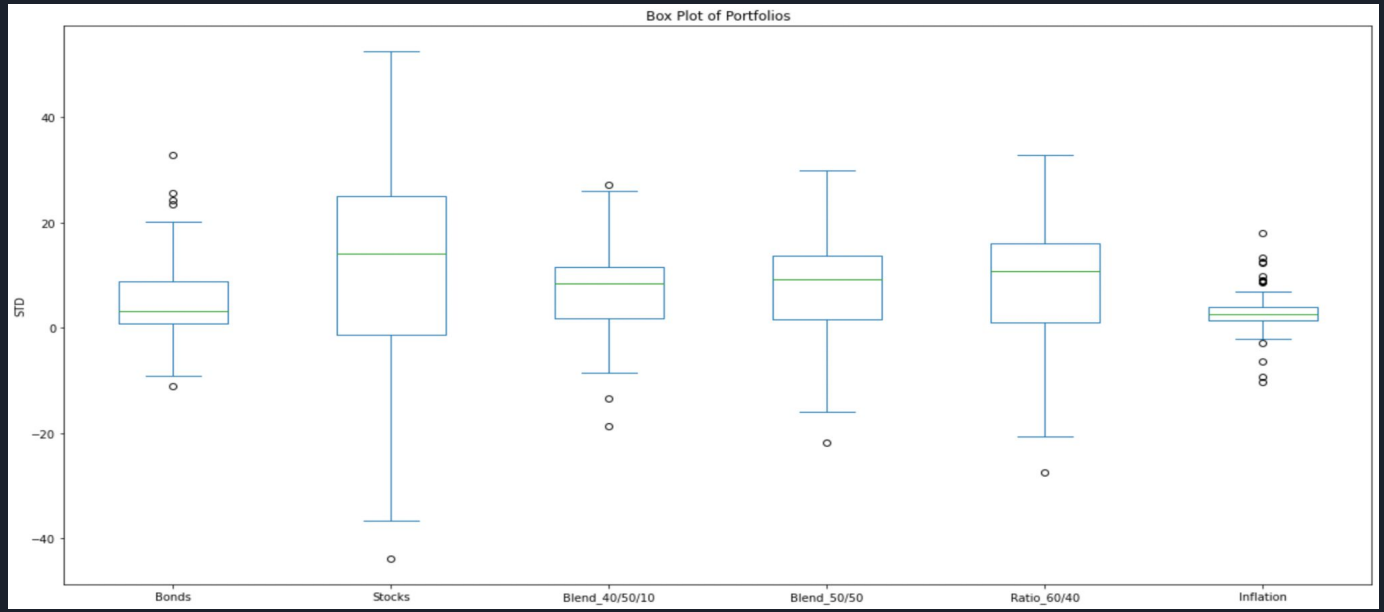
This graph displays the cumulative returns between the mixed investment types

Bar plot of STD



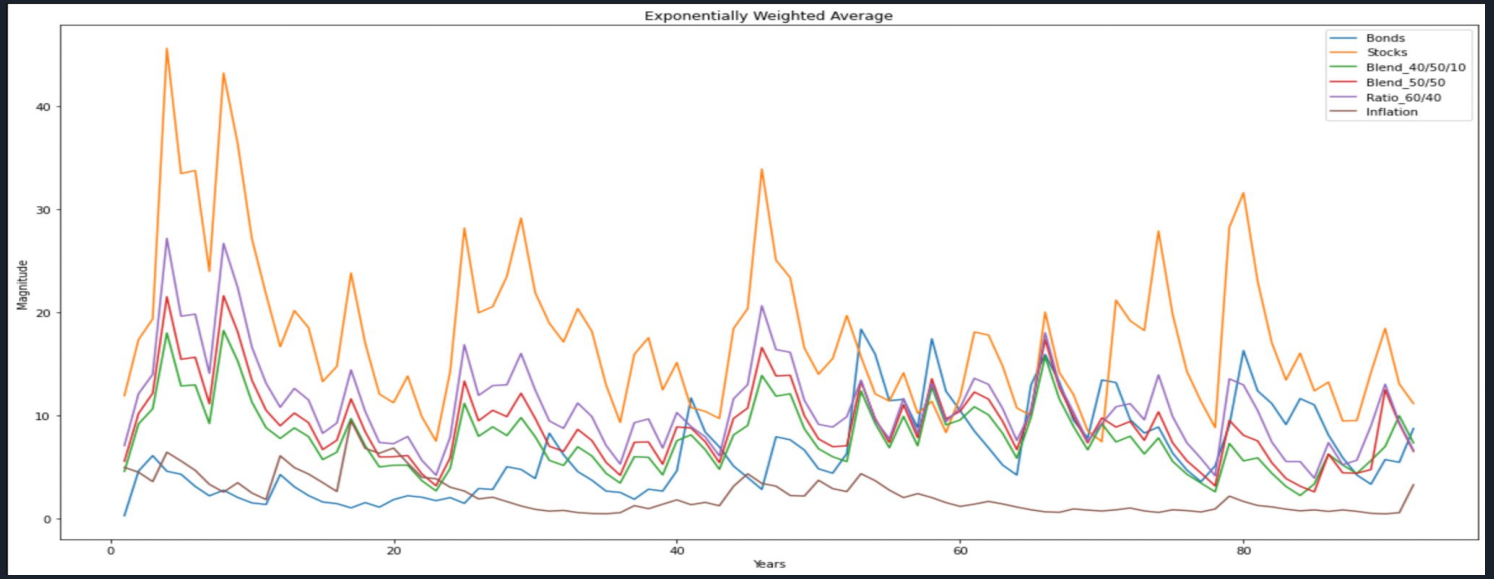
A bar graph to display the Standard Deviation of the portfolios

Standard Deviations of portfolios



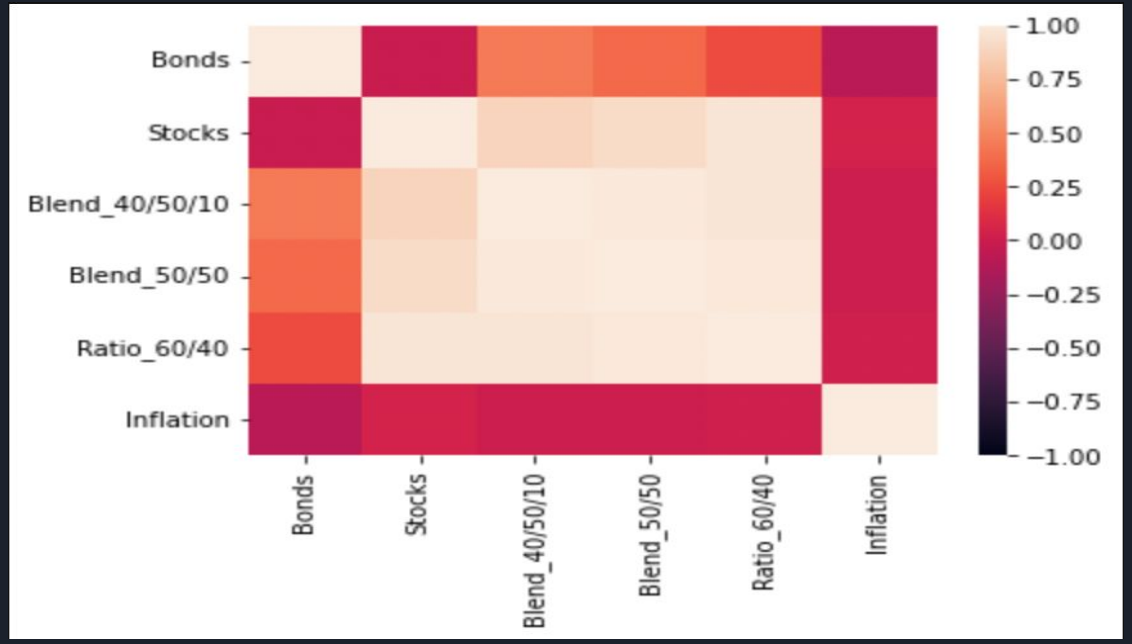
Box plots are used to understand the volatility of the different investment types

Exponentially Weighted Average



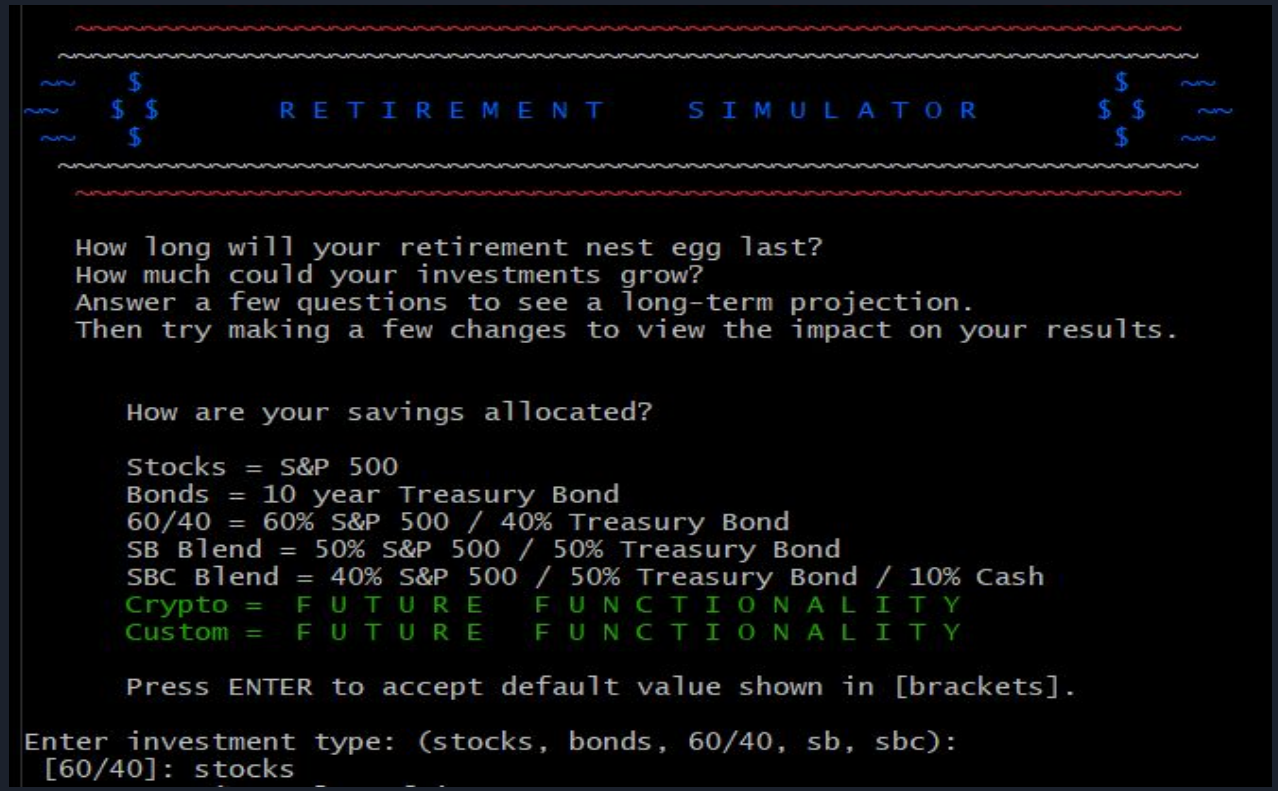
This graph shows the EWA of our portfolios. As shown, the portfolio (stocks) have the highest upside potential

Correlation

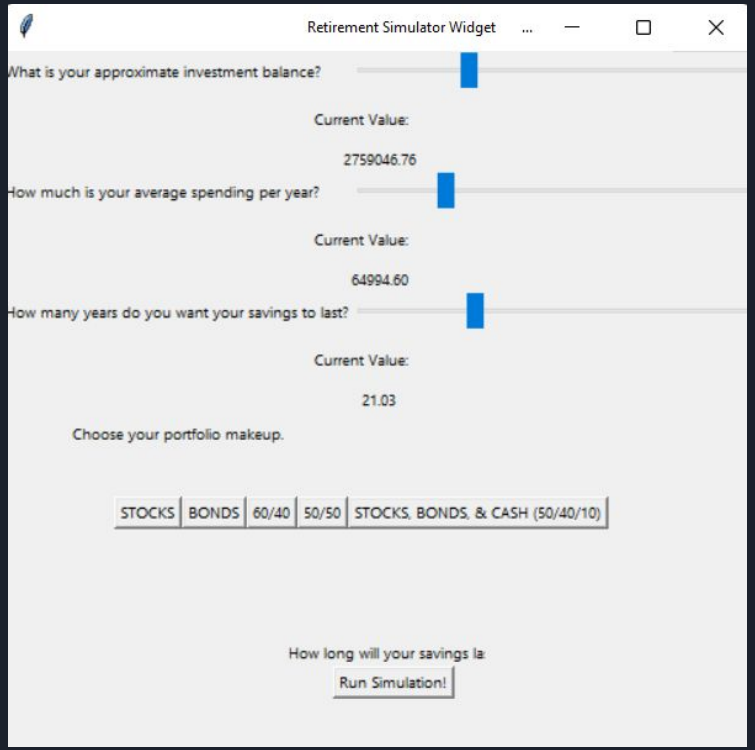


This graph displays the correlation between the portfolios.

Simulator Demo - Part 1 (Terminal Version)



Simulator Demo - Part 2 (GUI Version)



Summary

When predicting outcomes 30 to 40 years into the future can be a challenge. We are better off trying to keep things simple and focus on the most important and controllable issues. You can control when you retire, your investment asset allocation, how much you save, and how much you spend, but you can't control the stock market, interest rates, and inflation.

Monte Carlo Simulation gives you a more realistic assessment of how the future may unfold by looking at a wide variety of potential market scenarios that take fluctuating market returns into account. Instead of basing calculations on just one average rate of return, we generate thousands and thousands of simulations of hypothetical market scenarios, and calculate the impact on your savings during your retirement. Each simulation includes up and down markets of various lengths, intensities, and combinations.

Questions