

3x Leveraged ETFs and I-Bonds vs \$SPY/\$QQQ

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\$SPY and \$QQQ

- \$SPY is an exchange-traded fund (ETF) that tracks the performance of the S&P 500 index.
- The S&P 500 is a market-capitalization-weighted index of the 500 largest publicly traded companies in the United States.
- \$QQQ is another ETF that tracks the performance of the Nasdaq-100 index.
- The Nasdaq-100 is a market-capitalization-weighted index of the 100 largest non-financial companies listed on the Nasdaq stock exchange.
- \$SPY is often used as a proxy for the overall performance of the stock market, while \$QQQ is often used as a proxy for the performance of the technology sector.

What are 3x leveraged ETFs?

- Leveraged 3x ETFs are funds that track a wide variety of asset classes, such as stocks, bonds and commodity futures, and apply leverage in order to gain three times the daily or monthly return of the respective underlying index.
 - Such ETFs come in the long and short varieties
 - An ETF that is leveraged 3x seeks to return three times the return of the index or other benchmark that it tracks
 - A 3x S&P 500 index ETF, for instance, would return +3% if the S&P rose by 1%.
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Common uses for magnified exposure

This would apply to \$SPXL
and \$TQQQ

Seek magnified gains (will
also magnify losses)

Getting a target level of
exposure for less cash

Overweighting a market
segment without additional
cash



\$SPXL

The Direxion Daily S&P 500® Bull (SPXL) seeks daily investment results, before fees and expenses, of 300%, of the performance of the S&P 500® Index



\$TQQQ

- **TQQQ** Provides Leveraged (3x) UltraPro Exposure to the Daily Performance of the Nasdaq-100
- ProShares UltraPro® QQQ seeks daily investment results, before fees and expenses, that correspond to three times (3x) the daily performance of the Nasdaq-100 Index®.

Common uses for inverse exposure

This would apply to \$SPXS
and \$SQQQ

Seek to profit from a
market decline

Help to hedge against an
expected decline

Underweight exposure to
a market segment



\$SPXS

The Direxion Daily S&P 500® Bear (SPXS) 3X Shares seeks daily investment results, before fees and expenses, 300% of the inverse (or opposite), of the performance of the S&P 500® Index

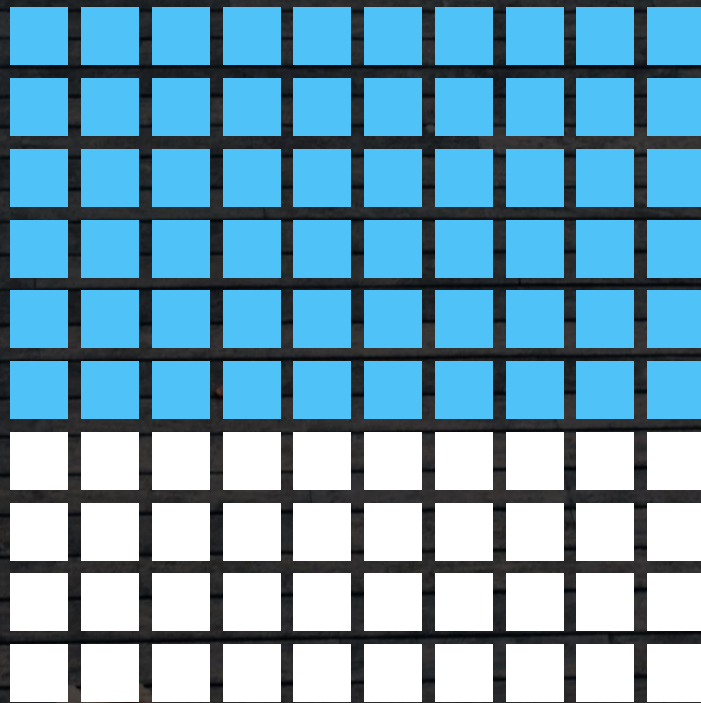


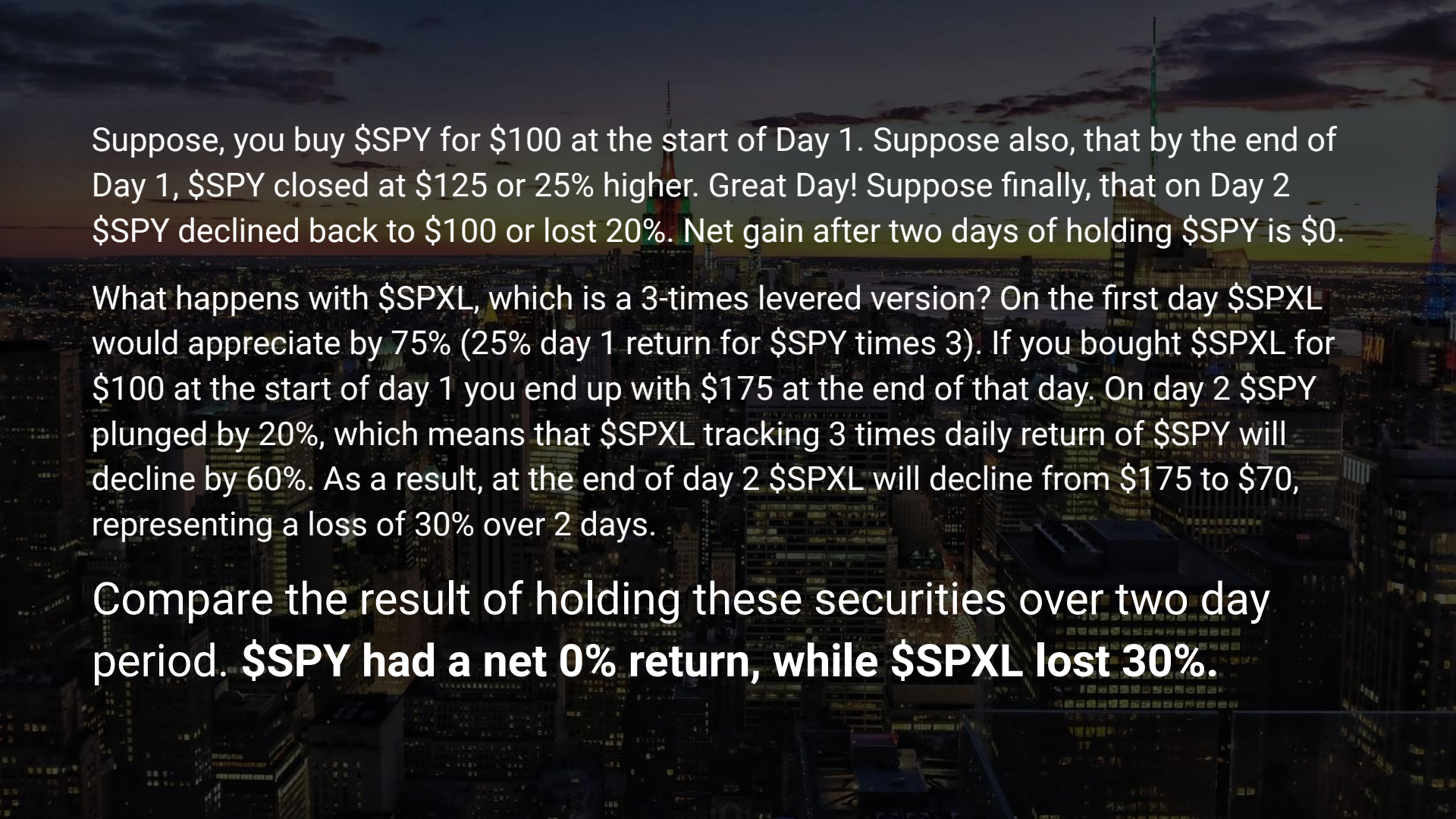
\$SQQQ

- The ProShares UltraPro Short QQQ (SQQQ) is a 3x leveraged inverse ETF that tracks the Nasdaq 100.
- ProShares UltraPro Short QQQ seeks daily investment results, before fees and expenses, that correspond to three times the inverse (-3x) of the daily performance of the Nasdaq-100 Index®.

Why not just buy and hold \$SPXL or \$TQQQ?

- While gains are tripled, so are losses.





Suppose, you buy \$SPY for \$100 at the start of Day 1. Suppose also, that by the end of Day 1, \$SPY closed at \$125 or 25% higher. Great Day! Suppose finally, that on Day 2 \$SPY declined back to \$100 or lost 20%. Net gain after two days of holding \$SPY is \$0.

What happens with \$SPXL, which is a 3-times levered version? On the first day \$SPXL would appreciate by 75% (25% day 1 return for \$SPY times 3). If you bought \$SPXL for \$100 at the start of day 1 you end up with \$175 at the end of that day. On day 2 \$SPY plunged by 20%, which means that \$SPXL tracking 3 times daily return of \$SPY will decline by 60%. As a result, at the end of day 2 \$SPXL will decline from \$175 to \$70, representing a loss of 30% over 2 days.

Compare the result of holding these securities over two day period. **\$SPY had a net 0% return, while \$SPXL lost 30%.**

What are I-Bonds?

- An I-bond is a type of savings bond issued by the US Treasury
 - It is a low-risk investment that offers a fixed rate of return plus inflation protection
 - I-bonds are a popular choice for investors who want to save for a long-term goal, such as retirement
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What are I-Bonds?

- I-bonds are purchased at face value (e.g. \$100) and earn interest for up to 30 years
 - The interest rate on an I-bond is made up of two components: a fixed rate and an inflation-linked rate
 - The fixed rate is set by the Treasury when the bond is issued and remains the same throughout the life of the bond
 - The inflation-linked rate is based on the Consumer Price Index (CPI) and is adjusted every six months
 - Investors can earn interest on their I-bonds by holding them until they mature or by redeeming them after one year
 - Interest on I-bonds is exempt from state and local taxes, and can be federally taxed at either the time of purchase or when the bond is redeemed.
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What are I-Bonds?

“Series I savings bonds protect you from inflation. With an I bond, you earn both a fixed rate of interest and a rate that changes with inflation. Twice a year, we set the inflation rate for the next 6 months.”

- These are at some of the highest interest rates in years because of the current inflation, reaching as high as a 10% return
 - Can only purchase \$10,000 worth
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DATE OF ISSUE	FIXED RATE	CPI'S USED TO CALCULATE SEMIANNUAL INFLATION RATE	SEMIANNUAL INFLATION RATE	EARNINGS OR COMPOSITE RATE
November 2022 through April 2023	0.40%	287.504 in March 2022 to 296.808 in September 2022	3.24%	6.89%
May 2022 through October 2022	0.00%	274.310 in September 2021 to 287.504 in March 2022	4.81%	9.62%
November 2021 through April 2022	0.00%	264.877 in March 2021 to 274.310 in September 2021	3.56%	7.12%
May 2021 through October 2021	0.00%	260.280 in September 2020 to 264.877 in March 2021	1.77%	3.54%
November 2020 through April 2021	0.00%	258.115 in March 2020 to 260.280 in September 2020	0.84%	1.68%
May 2020 through October 2020	0.00%	256.759 in September 2019 to 258.115 in March 2020	0.53%	1.06%
November 2019 through April 2020	0.20%	254.202 in March 2019 to 256.759 in September 2019	1.01%	2.22%
May 2019 through October 2019	0.50%	252.439 in September 2018 to 254.202 in March 2019	0.70%	1.90%
November 2018 through April 2019	0.50%	249.554 in March 2018 to 252.439 in September 2018	1.16%	2.83%
May 2018 through October 2018	0.30%	246.819 in September 2017 to 249.554 in March 2018	1.11%	2.52%
November 2017 through April 2018	0.10%	243.801 in March 2017 to 246.819 in September 2017	1.24%	2.58%
May 2017 through October 2017	0.00%	241.428 in September 2016 to 243.801 in March 2017	0.98%	1.96%
November 2016 through April 2017	0.00%	238.132 in March 2016 to 241.428 in September 2016	1.38%	2.76%
May 2016 through October 2016	0.10%	237.945 in September 2015 to 238.132 in March 2016	0.08%	0.26%
November 2015 through April 2016	0.10%	236.119 in March 2015 to 237.945 in September 2015	0.77%	1.64%
May 2015 through October 2015	0.00%	238.031 in September 2014 to 236.119 in March 2015	-0.80%	0.00%

Current Interest Rate

Series I Savings Bonds

6.89%

For savings bonds issued November 1, 2022 to April 30, 2023.



Implementing I-Bonds in the MarketSim

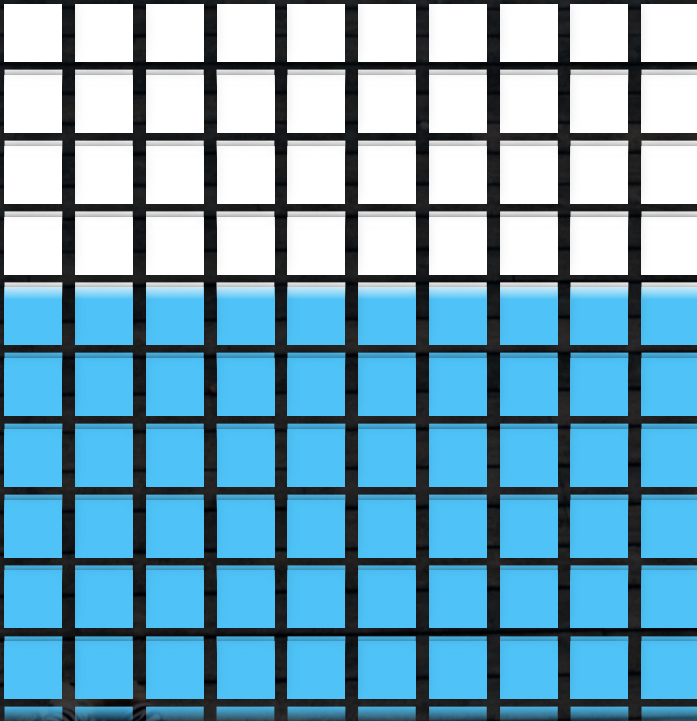
- Having to incorporate IBonds was much more difficult than expected
- I settled on manually editing a csv file for each dollar value of portfolio needed to be IBonds, and then in my order csv files, I would "buy" 1 stock of that I Bond whose price I manipulated to act like it would pay out interest twice a year every 6 months.

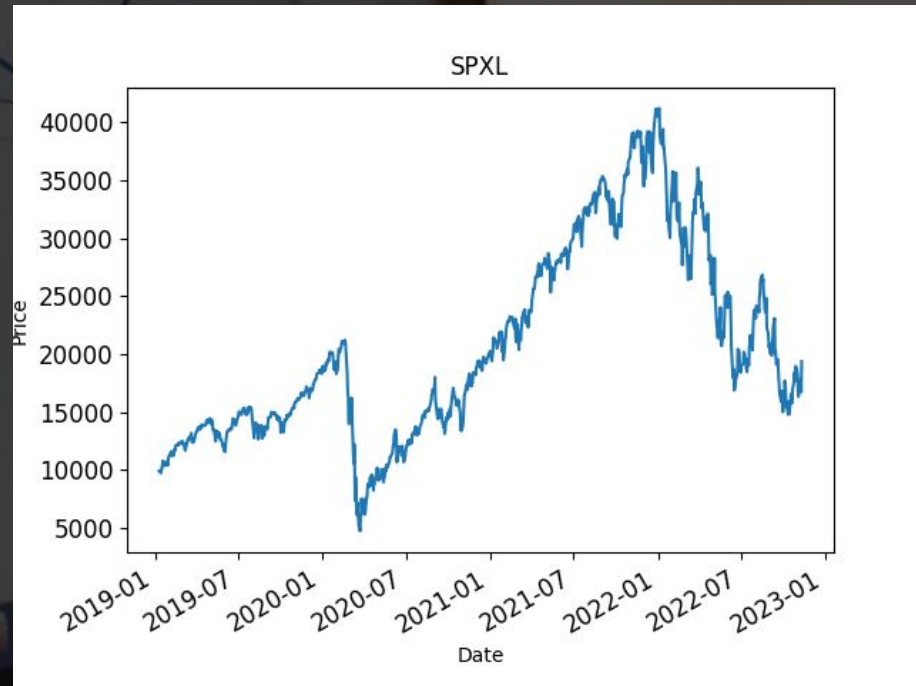
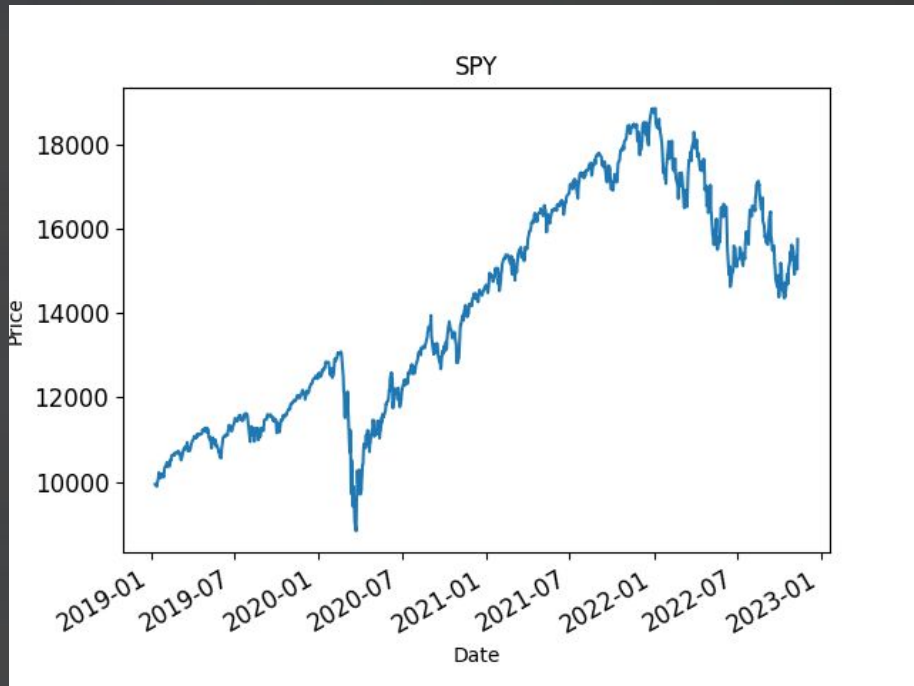
Experimental Portfolios

These are the portfolios I created for my project:

- Portfolio #1: 100% \$SPY
- Portfolio #2: 100% \$SPXL
- Portfolio #3: 100% \$QQQ
- Portfolio #4: 100% \$TQQQ
- Portfolio #5: 100% \$SQQQ
- Portfolio #6: 40% \$SPXL, 40% \$TQQQ, 20% \$SQQQ
- Portfolio #7: 100% \$SQQQ (2022 ONLY)
- Portfolio #8: 80% \$SPY, 20% I-Bonds (2019)
- Portfolio #9: 50% \$SPXL, 50% I-Bonds (2019)
- Portfolio #10: 20% \$SQQQ, 80% I-Bonds (2019)
- Portfolio #11: 100% I-Bonds (2019)

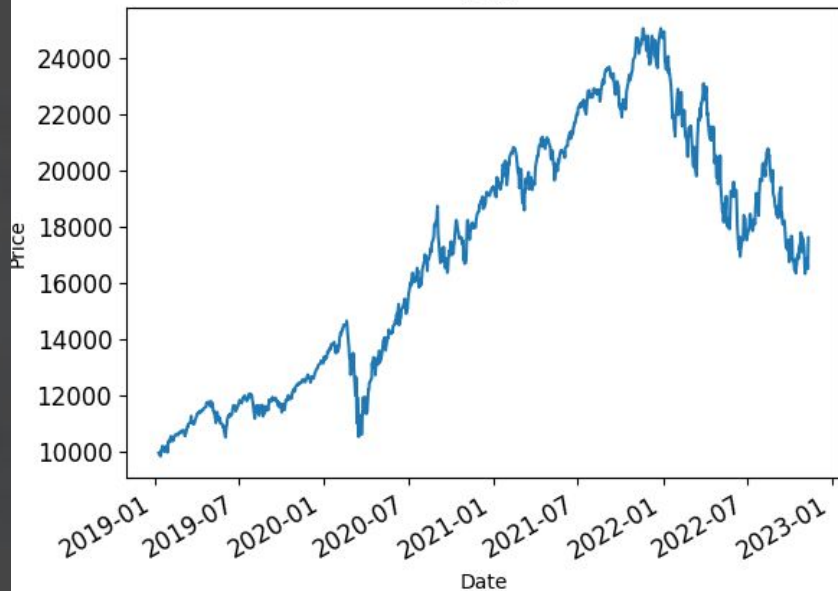
Results



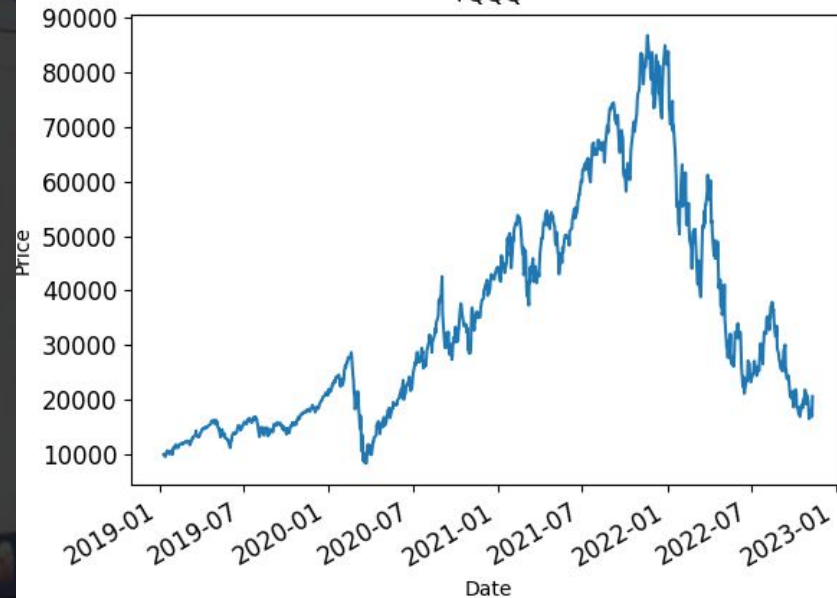


Portfolio #1 and Portfolio #2

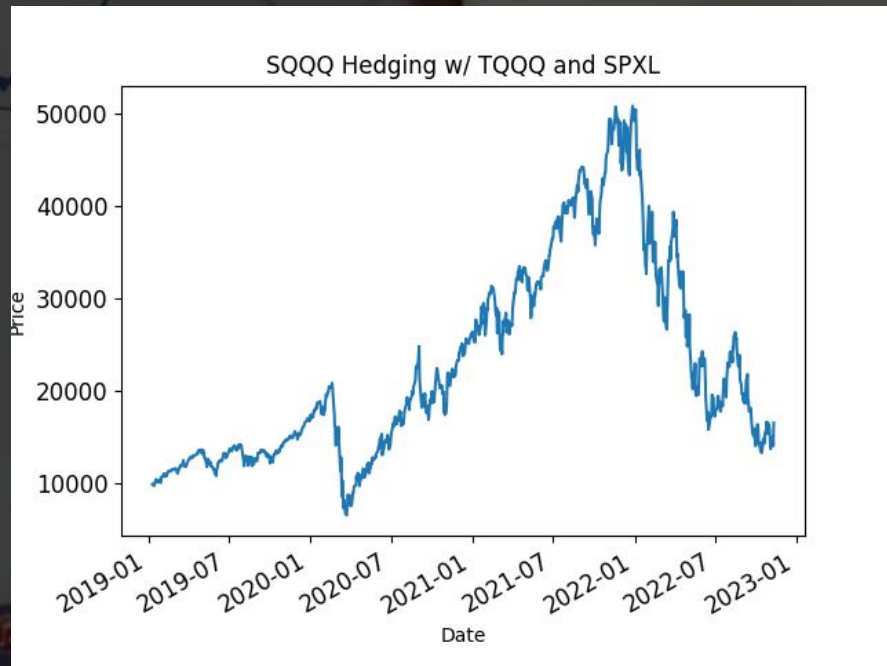
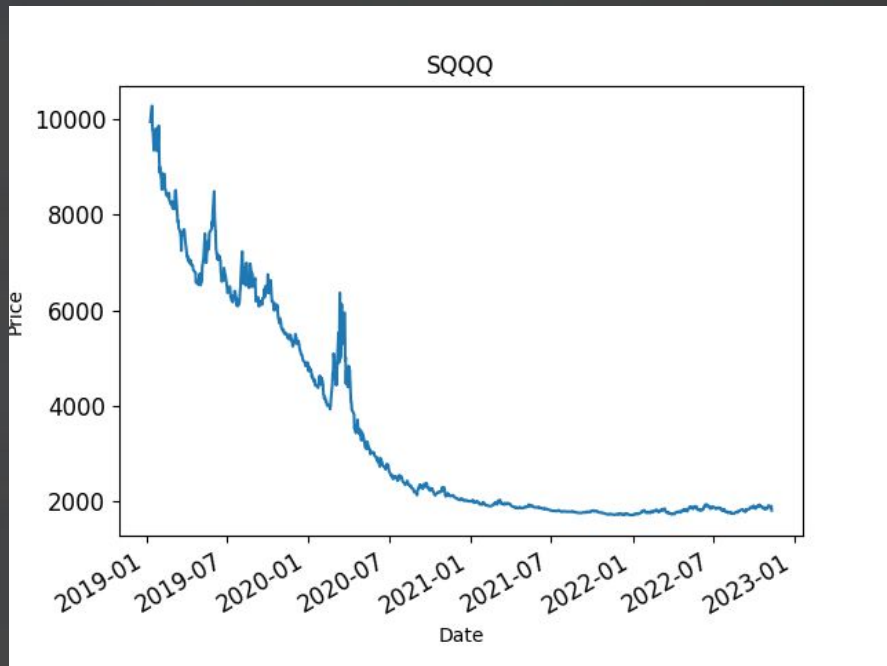
QQQ



TQQQ

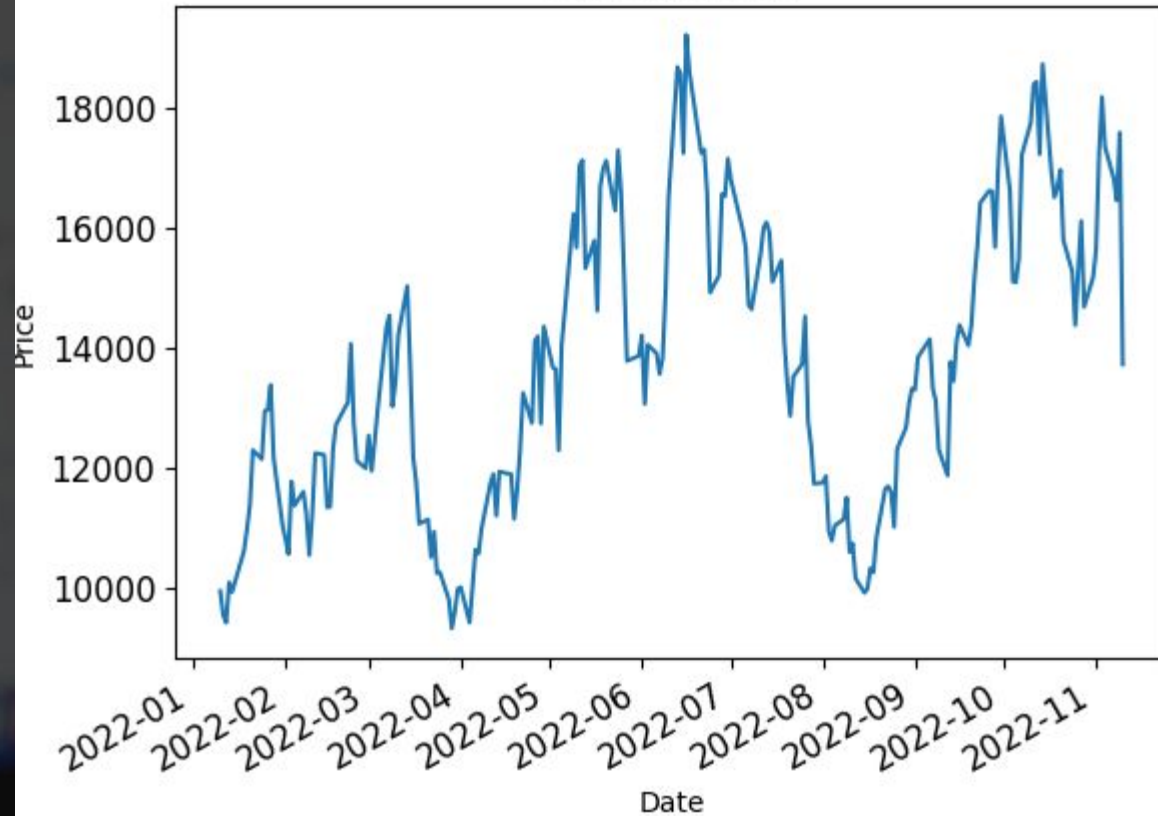


Portfolio #3 and Portfolio #4

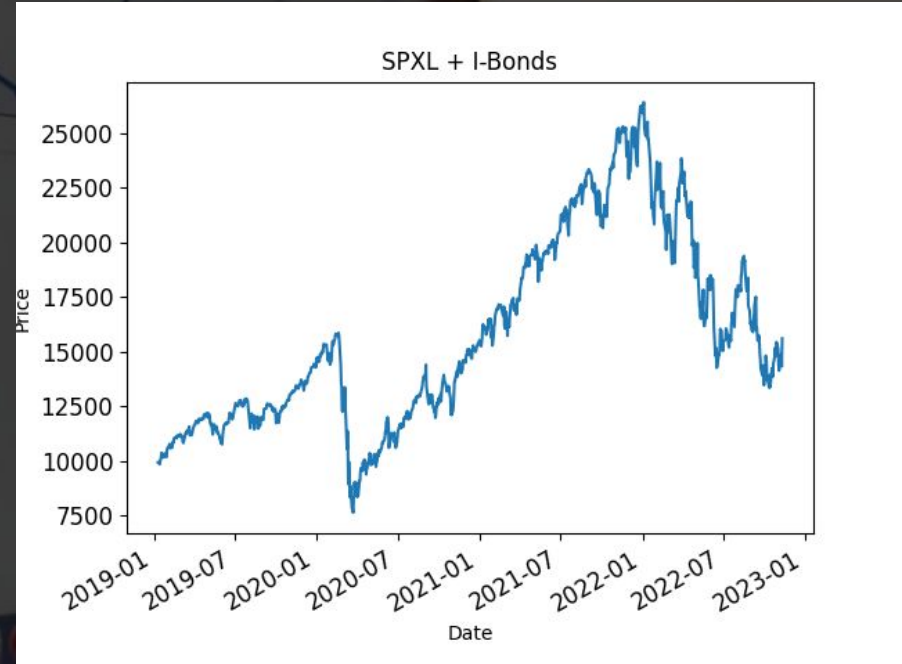
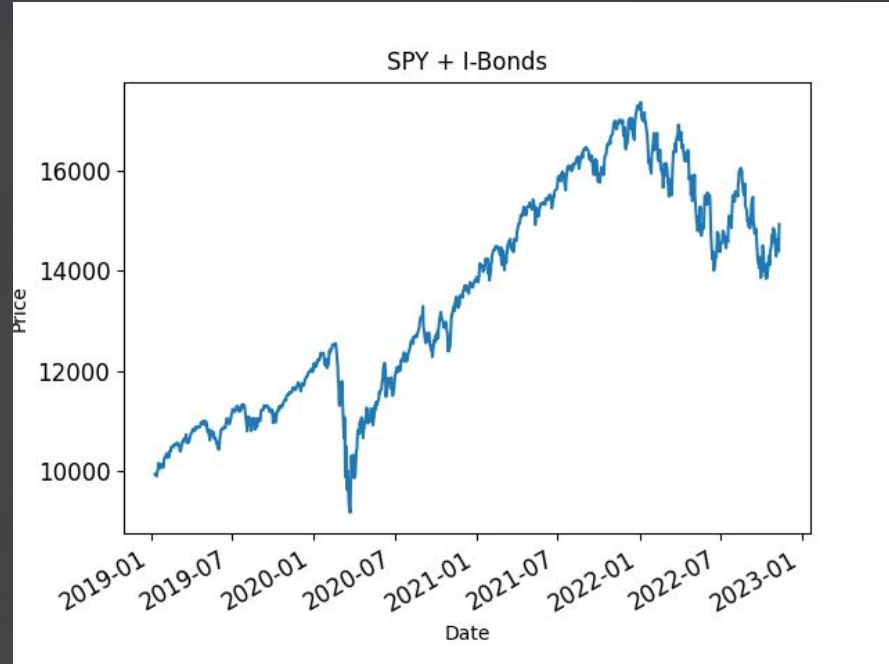


Portfolio #5 and Portfolio #6

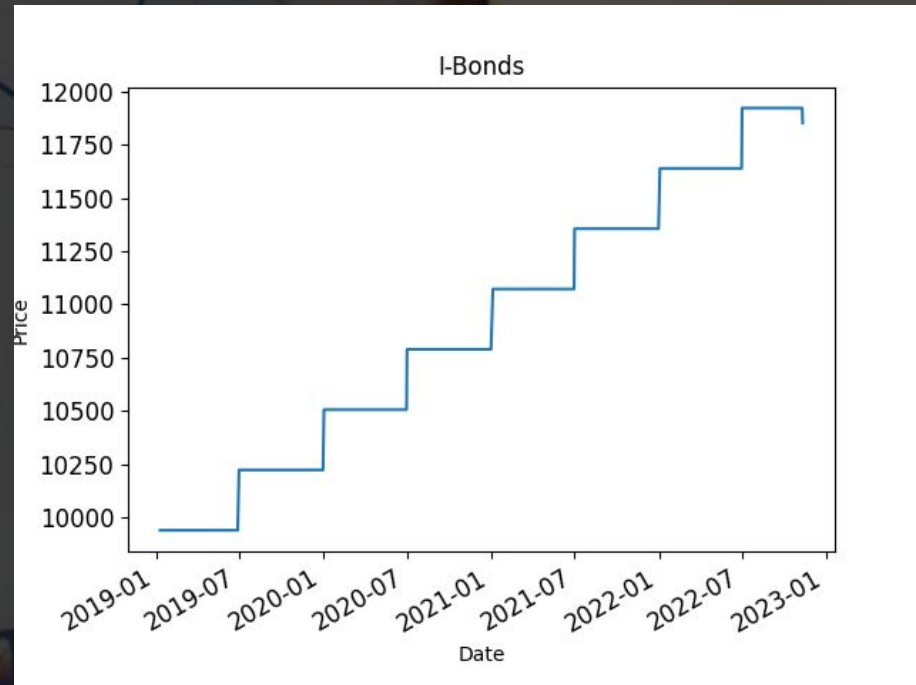
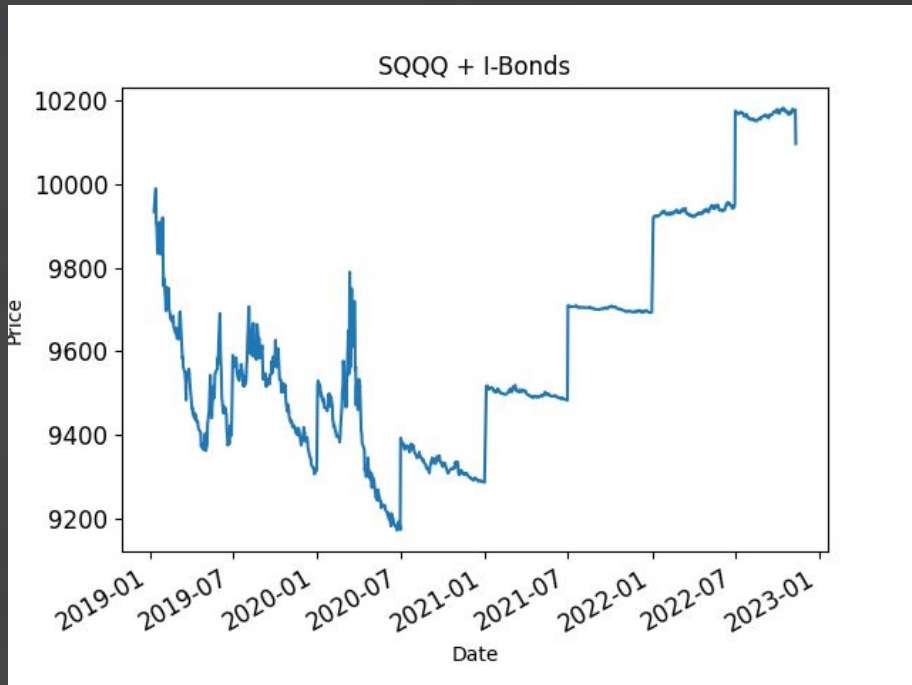
SQQQ in 2022



Portfolio #7



Portfolio #8 and Portfolio #9



Portfolio #10 and Portfolio #11

Questions?