Report: Strategies

I.   Jolteon:

Analysis:

Z-score of Mid-price (Rolling 200)

Rolling Volatility (200 Timestamp Window)
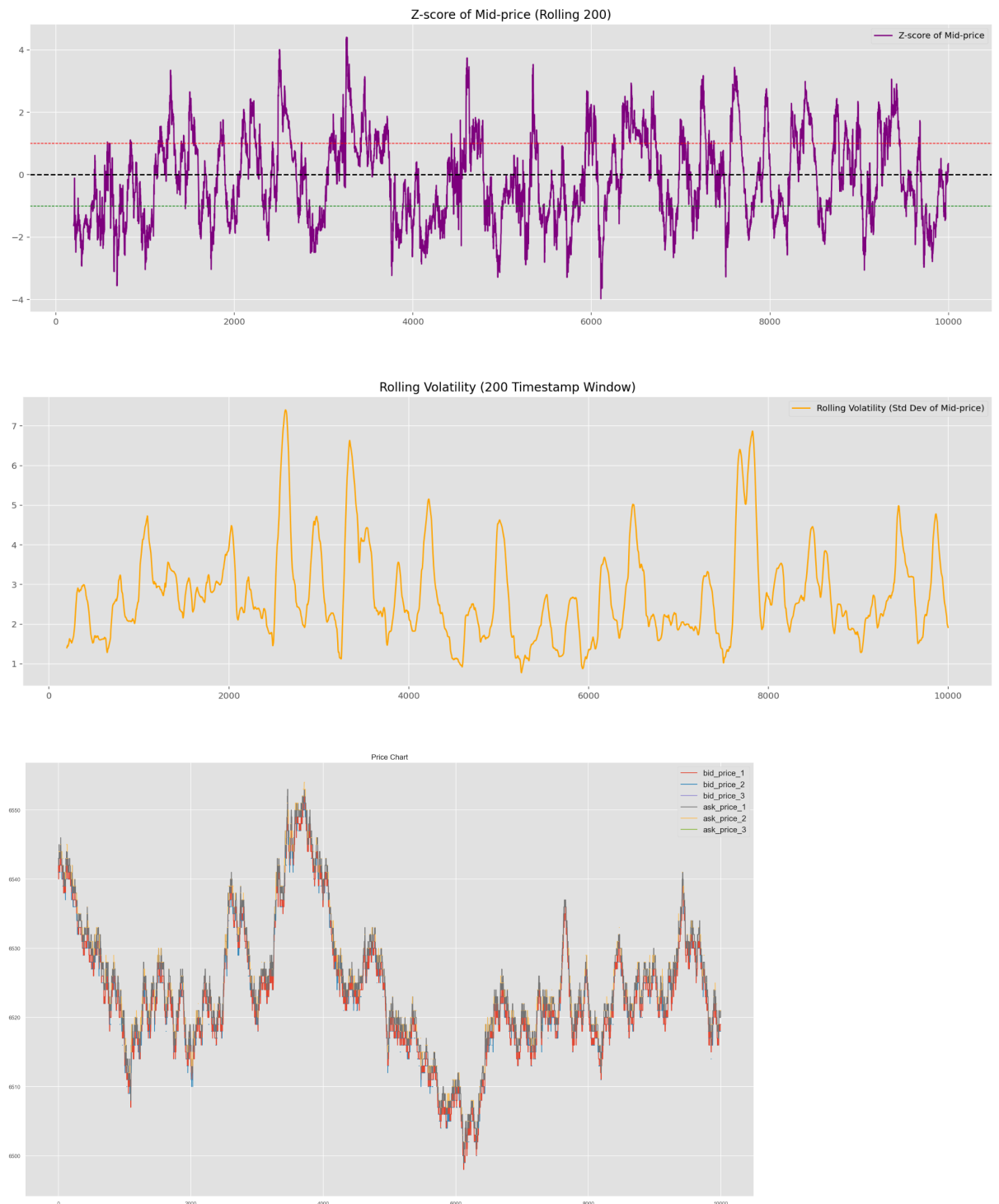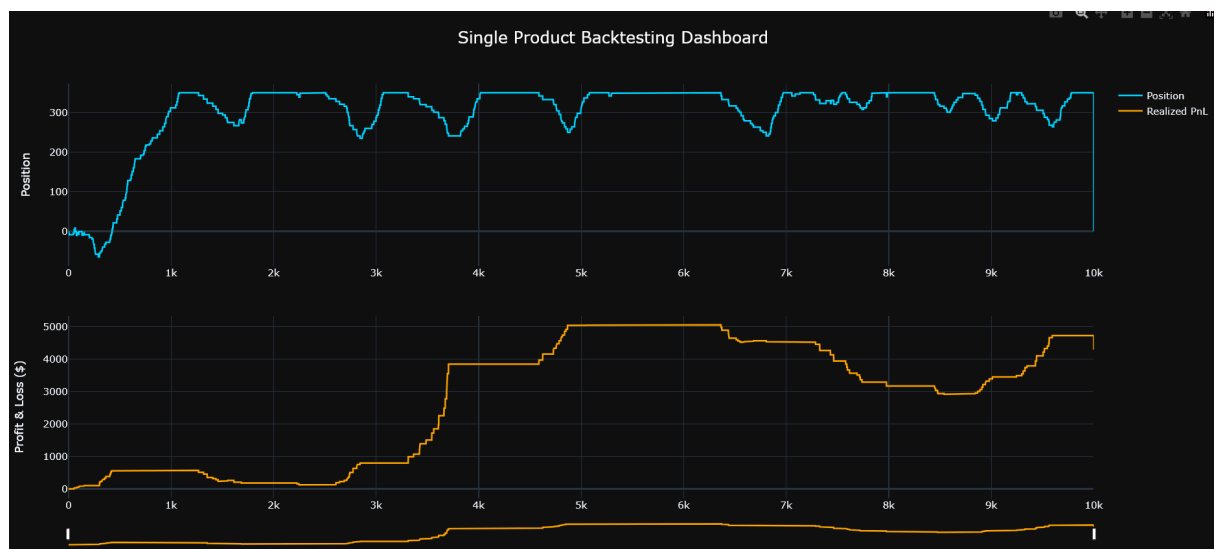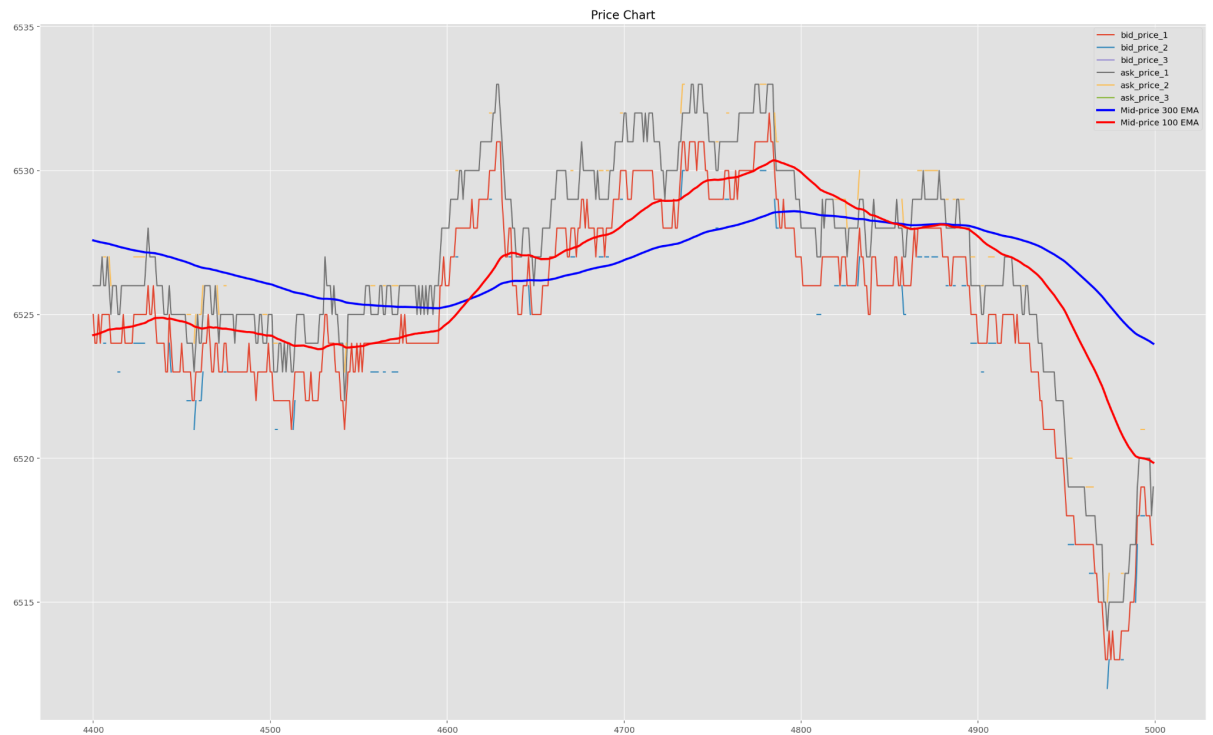

Price Chart

This shows that the jolteon is volatile in the long run as well as short run.
I wanted to use a strategy that would capitalize on these price movements.

Strategy used: EMA crossover

Buy signals are triggered when faster EMA (period = 100) crosses over the slower EMA(period = 300).

Sell signals are triggered when faster EMA(period = 100) crosses below the slower EMA.
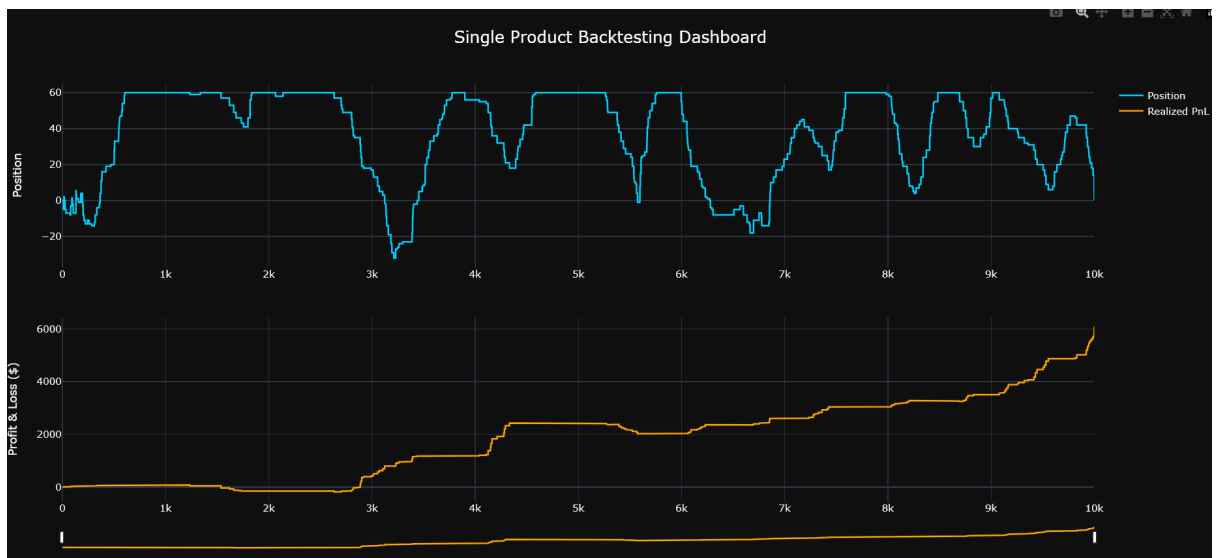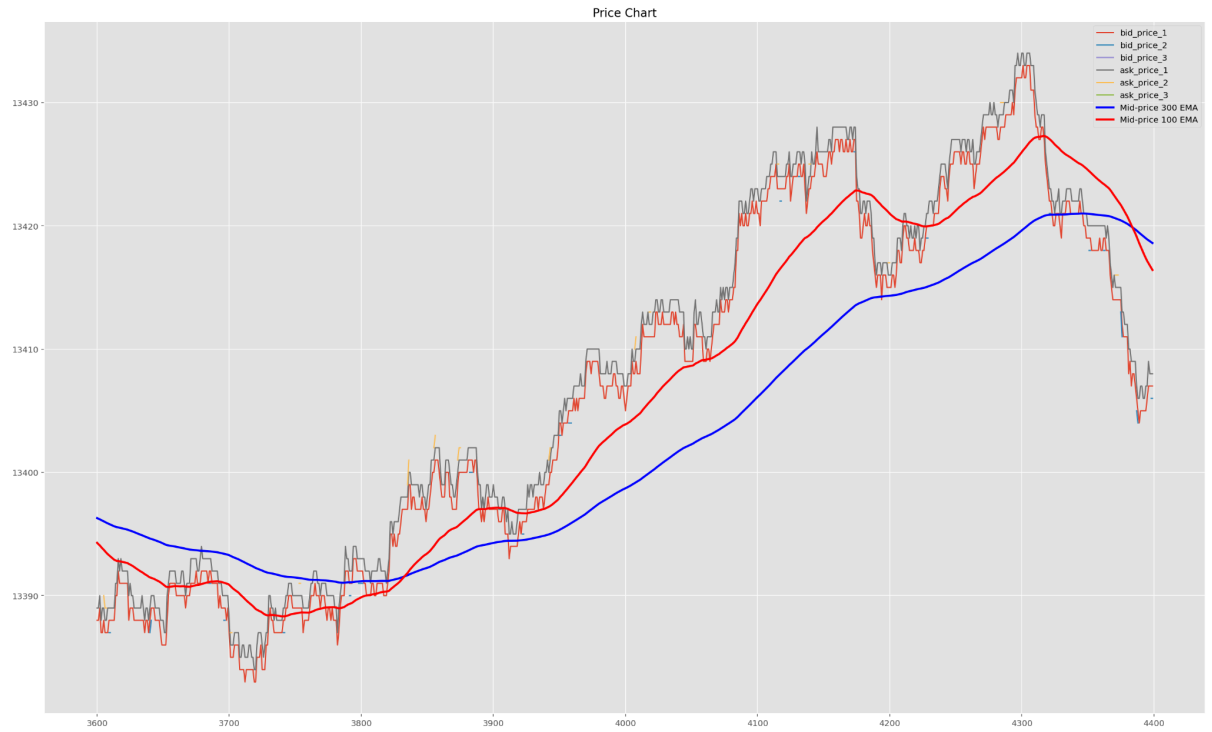
When there are no crossovers -> continue with a market making strategy.

Price Chart

Single Product Backtesting Dashboard

Final Pnl = 4297

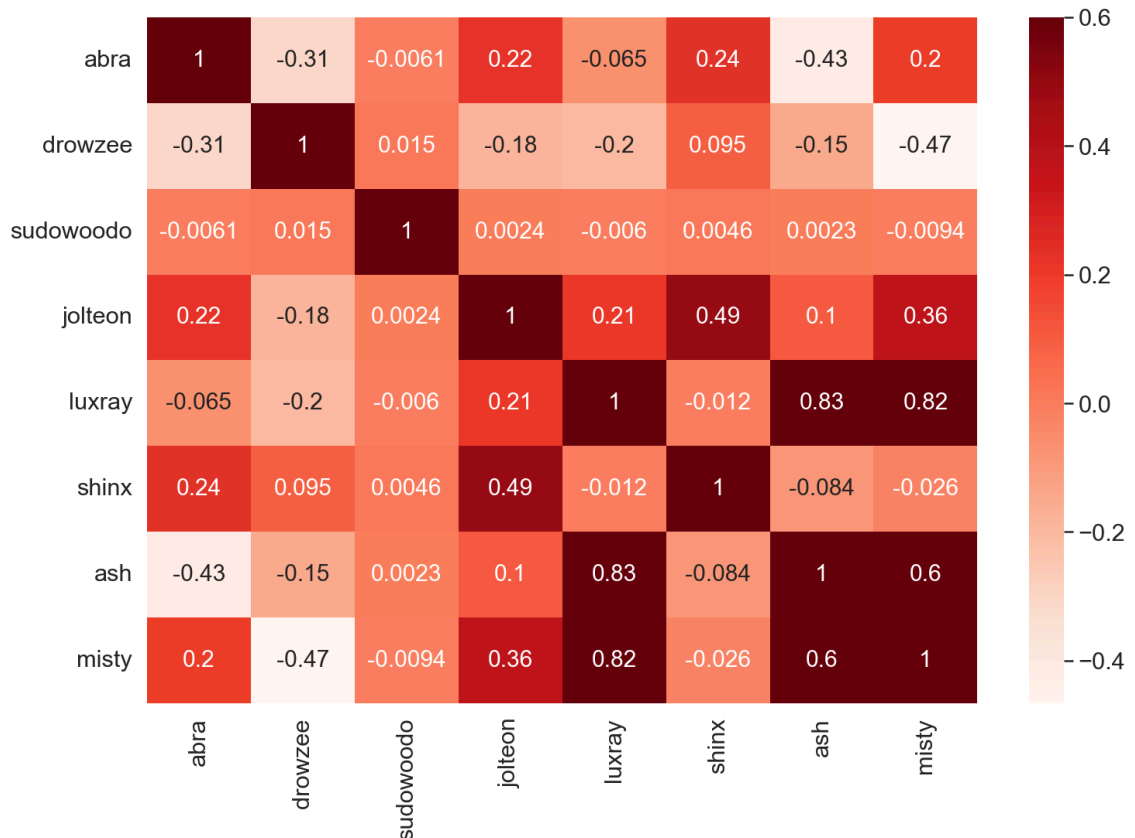## II.   Shinx:

Same strategy as that of jolteon

Final Pnl = 6090

III.   Luxray:

Here is the Correlation heatmap of all the products given. The figure shows the
correlation between all the assets available to us.
The following code was used for it:
https://github.com/Jaideep2006/Algo-Trading-Project/blob/main/correlation.py

	abra	drowzee	sudowoodo	jolteon	luxray	shinx	ash	misty
abra	1	-0.31	-0.0061	0.22	-0.065	0.24	-0.43	0.2
drowzee	-0.31	1	0.015	-0.18	-0.2	0.095	-0.15	-0.47
sudowoodo	-0.0061	0.015	1	0.0024	-0.006	0.0046	0.0023	-0.0094
jolteon	0.22	-0.18	0.0024	1	0.21	0.49	0.1	0.36
luxray	-0.065	-0.2	-0.006	0.21	1	-0.012	0.83	0.82
shinx	0.24	0.095	0.0046	0.49	-0.012	1	-0.084	-0.026
ash	-0.43	-0.15	0.0023	0.1	0.83	-0.084	1	0.6
misty	0.2	-0.47	-0.0094	0.36	0.82	-0.026	0.6	1

Luxray and Ash have a high correlation(0.83) but the pairs trading strategy gave
massive losses.
This was probably because while the assets were correlated they weren't
co-integrated i.e they did not show a mean-reverting nature. This was verified by the
Engle-Granger test:
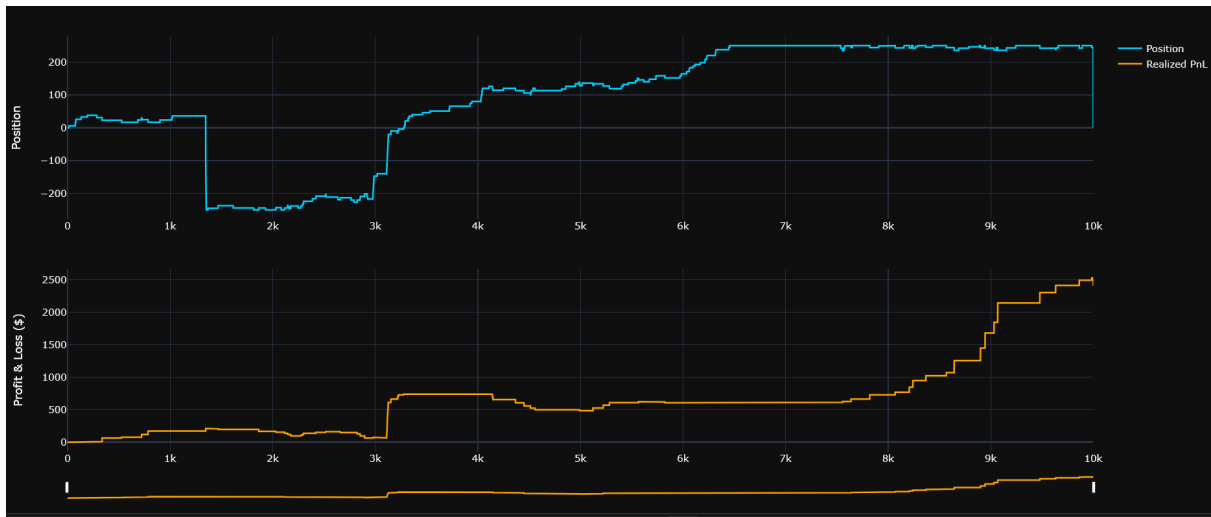https://github.com/Jaideep2006/Algo-Trading-Project/blob/main/cointegration_test.py
So I decided against using Pairs trading.

For Luxray I used RSI-based strategy:
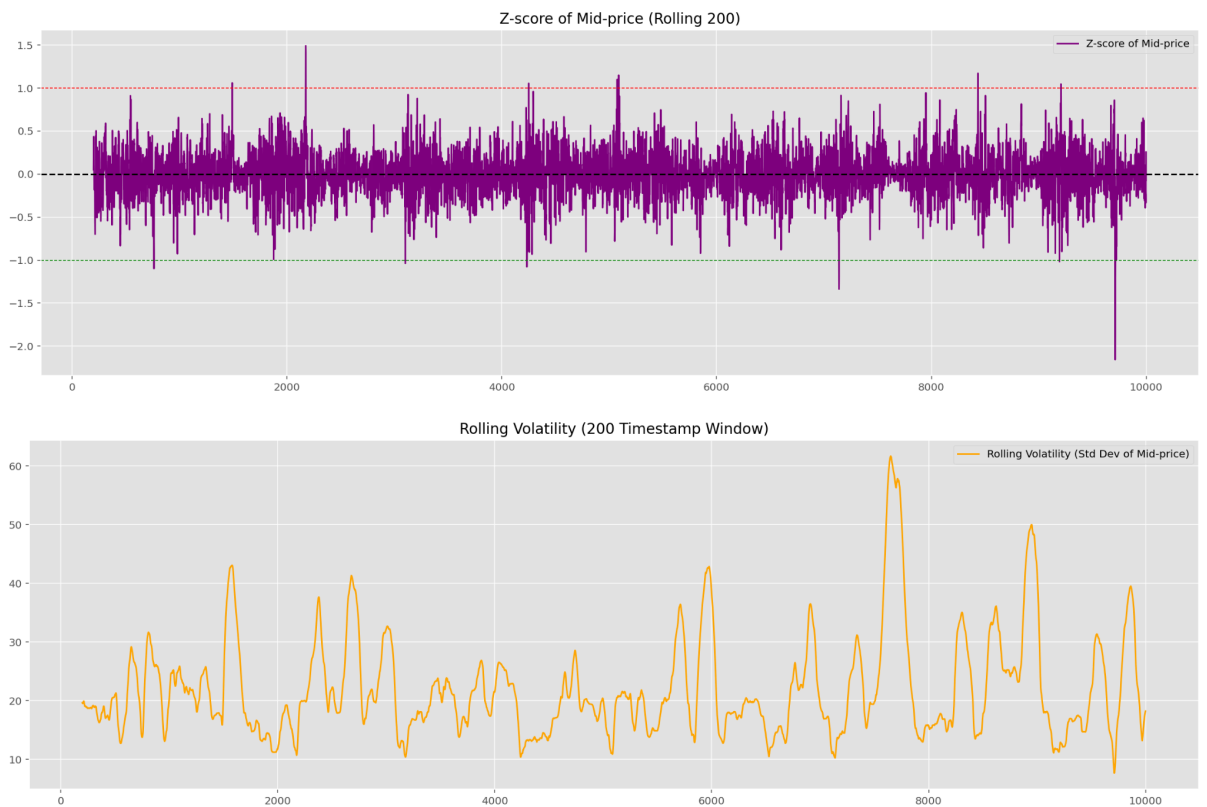RSI > 90 → buy
RSI < 10 → sell
Otherwise → market-making
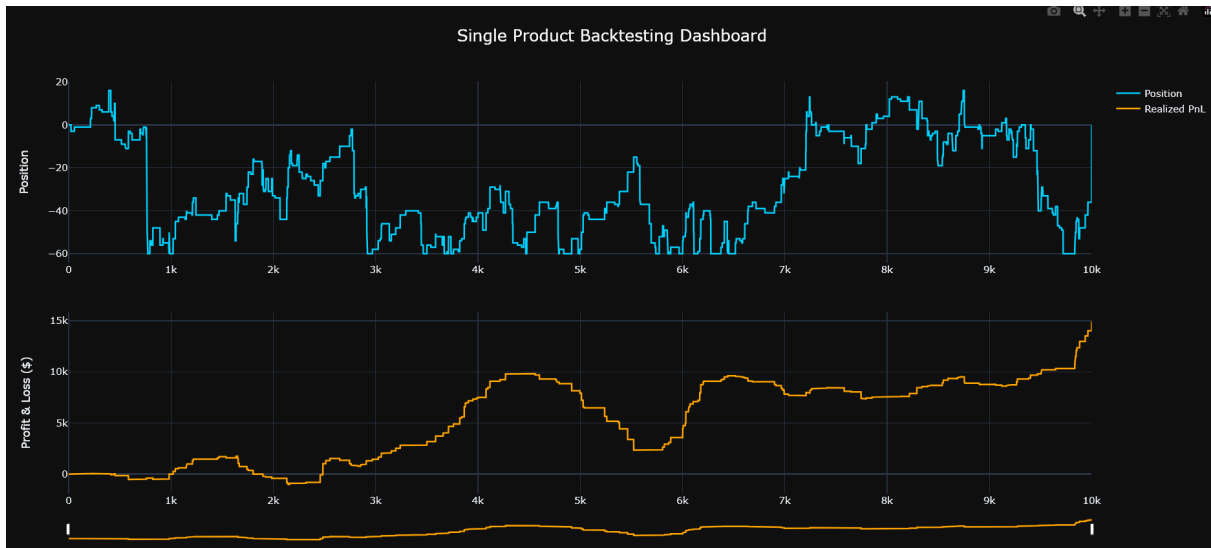
Final Pnl = 2412

IV.   Ash:

Looking at the volatility I thought that bollinger band mean reversion strategy might be best for Ash.

When mid_price crosses below the lower band → buy signal

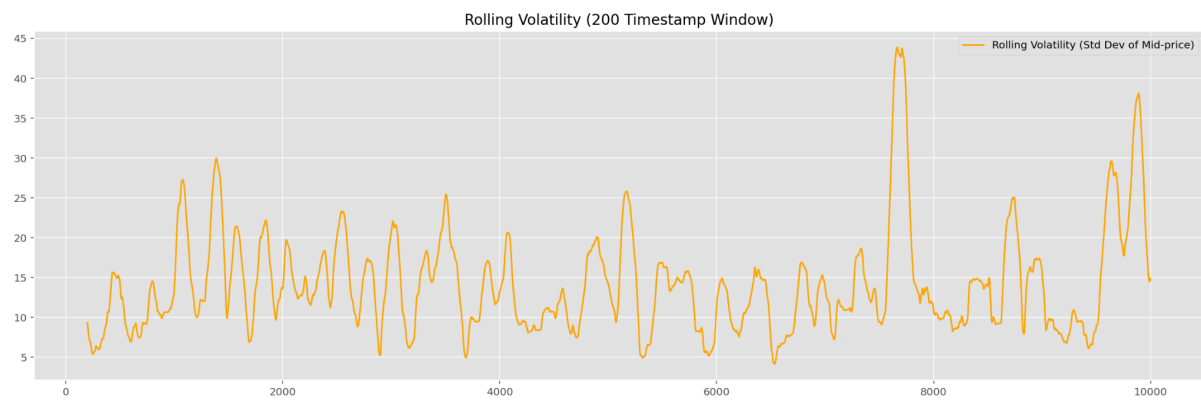When mid_price crosses above the upper band → sell signal

Passive market making when the mid_price is in between the upper and lower band.

I have also added stop losses → if the price drops much lower than the lower band, then sell and aggressive short selling → If price rises much above the upper band, then short sell.
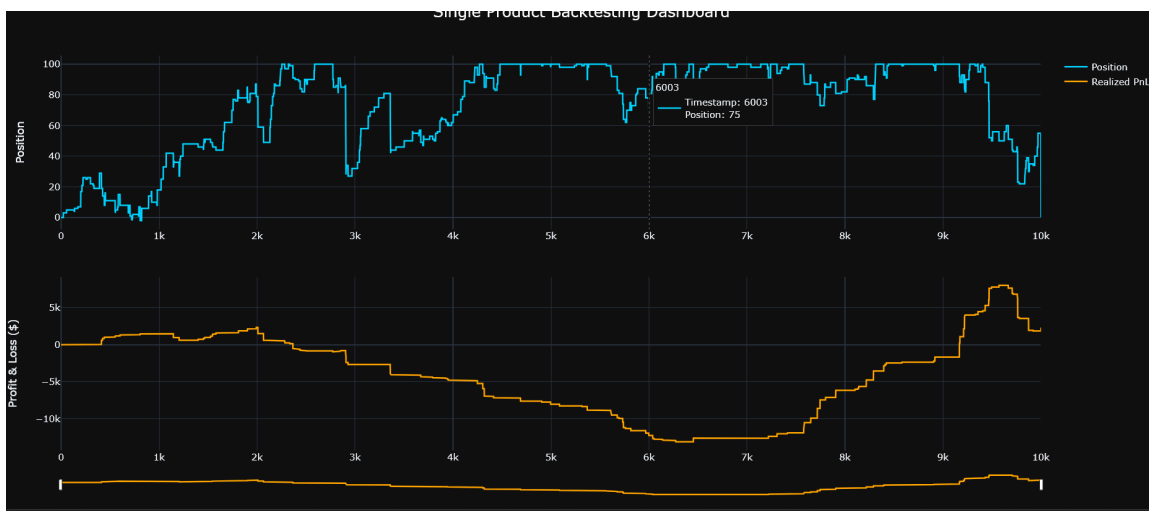
Final Pnl = 14949

V.   Misty:

So same strategy as Ash

Final Pnl = 2341