TECHNICAL REPORT

1. Introduction

This project is about creating a simple trading strategy that buys a stock when its price falls too much and sells it when the price goes too high. This idea is called **mean reversion**, which means prices usually return to their average after going up or down too much.

We tested this strategy on **GAIL India Ltd. (GAIL.NS)** using stock data from **2010 to early 2025**.

2. Tools and Data Used

Python Libraries: `yfinanace`, `backtesting.py`, `pandas`, `talib`

Data Source: Yahoo Finance

Time Period: September 2010 to February 2025

Initial Money: ₹1,00,000

Brokerage Cost: 0.2% per trade

3. Indicators Used

We used 3 indicators to decide when to buy or sell:

a) Simple Moving Averages (SMA)

SMA 20: Short-term average

SMA 90: Long-term average

When the short SMA goes above the long SMA, we think the price might rise → **Buy**

When the long SMA goes above the short SMA, we may sell

b) RSI (Relative Strength Index)

RSI tells us if a stock is overbought or oversold.
Below 30: Stock is oversold → may go up → **Buy**

Above 68: Stock is overbought → may fall → **Sell**

c) Z-Score

This measures how far the price is from its average.

If **Z-score < -1**: price is low compared to average → **Buy**

If **Z-score > 1**: price is too high → **Sell**

4. When Do We Buy or Sell?

We **Buy** the stock if any of these happens:

RSI goes above 30

Short SMA crosses above Long SMA

Z-score is below -1

We **Sell** (exit) if any of these happens:

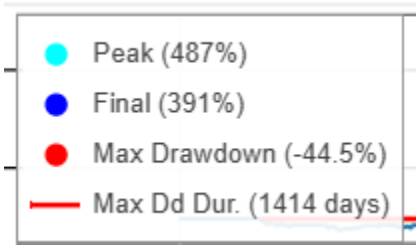
RSI goes above 68

Long SMA crosses above Short SMA

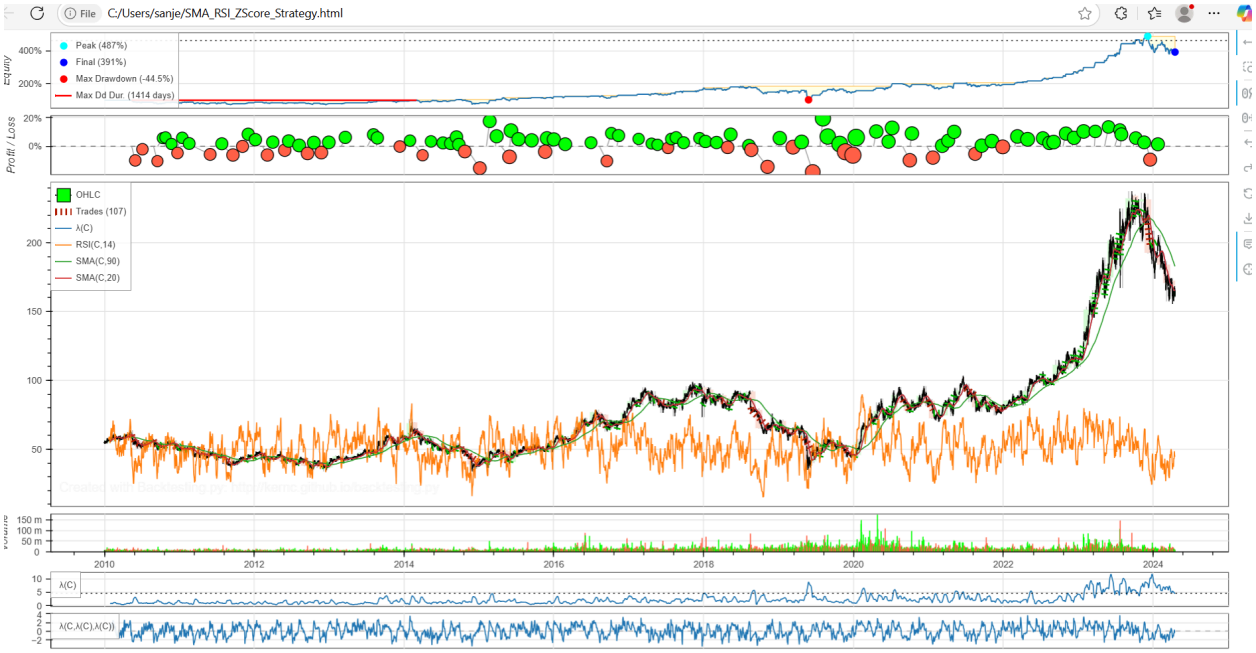
Z-score is above 1

5. Results of the Strategy

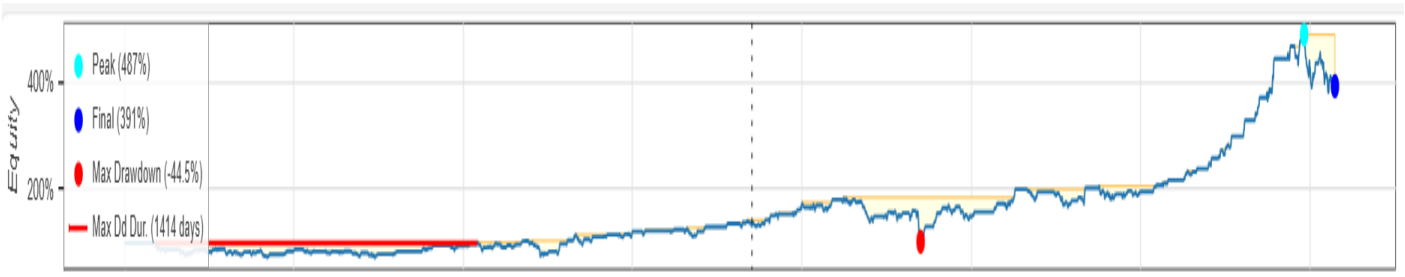
Here are some of the key results after running the strategy



6. Charts and Graphs



7.Equity curve



8. Where I Learned This From

I used the following websites and sources to learn about trading and build this strategy:

Investopedia – for SMA, RSI, and Z-score concepts

Zerodha - for technical indicators in Python

Backtesting.py Docs – for writing and running the backtest

YouTube tutorials on RSI and mean reversion

online blogs