Assignment 1 – Question 1: Technical Indicators

In this assignment, I implemented three technical indicators from different indicator baskets: Rate of Change (RoC) from momentum indicators, Negative Volume Index (NVI) from volume indicators, and Parabolic SAR from volatility indicators. The indicators were coded in Python using daily Bitcoin price data.

1. Rate of Change (RoC)
Rate of Change is a momentum indicator that measures the percentage change in price over a fixed lookback period. It helps in identifying whether the price momentum is positive or negative. I used a 14-day lookback period, which is commonly used in practice to capture short-term momentum without being too noisy. The closing price was used for calculation since it reflects the final market consensus of the day.

2. Negative Volume Index (NVI)
Negative Volume Index focuses on price movements on days when trading volume decreases compared to the previous day. The idea behind NVI is that informed or smart traders are more active during low-volume days. The index was initialized with a base value of 1000. On days when volume declined, the NVI was adjusted based on the percentage change in closing price. On days when volume increased, the NVI value was carried forward unchanged.

3. Parabolic SAR
Parabolic SAR is a volatility-based indicator used to identify trend direction and possible reversal points. When the price is above the SAR value, it indicates an uptrend, and when the price is below the SAR, it indicates a downtrend. I used the standard acceleration factor of 0.02 with a maximum value of 0.2, as these parameters provide a good balance between responsiveness and stability in trend detection.

Conclusion
These three indicators together provide insights into momentum, volume behavior, and trend direction. They were later used consistently in the trading strategy implemented in Question 2.