**Feature Calculations**

1. **Trend:**

**Method Used**: ‘seasonal\_decompose’ from the ‘statsmodels.tsa.seasonal’ module. **Description**: The trend captures the underlying progression in a time series, removing short-term fluctuations.

**Calculation**: The trend is derived by taking a moving average of the series. For daily data with a period of 365, the trend mirrors the 365-day moving average.

1. **Seasonality:**

**Method Used:** ‘seasonal\_decompose’

**Description**: Seasonality captures repetitive and periodic patterns in a time series. For instance, a pattern that recurs annually would be captured by this component. **Calculation**: For daily data with a period of 365, seasonality denotes patterns that manifest every 365 days.

1. **Residual:**

**Method Used:** ‘seasonal\_decompose’

**Description**: Once the trend and seasonality are removed from the original series, what remains is the residual. It can be seen as the "noise" in the series.

**Calculation**:

Residual = Original Series − Trend – Seasonality

1. **EMA (Exponential Moving Average):**

**Description**: A type of moving average where recent data points have more weight. Assists in identifying short-term price trends and reversals.

**Calculation**: Using a smoothing factor for a span 'n': EMA at time ’t’ = (Close at time ‘t’ × Smoothing Factor) + (EMA at (time ‘t’ – 1) × (1 − Smoothing Factor))

1. **RSI (Relative Strength Index)**:

**Description**: A momentum oscillator that gauges the speed and change of price movements. Values range from 0 to 100, indicating overbought or oversold conditions. **Calculation**:

* Daily price change: Δ Close = Close t − Close t − 1.
* Average gain and average loss over 'n' days.
* Relative strength (RS): RS = average gain/average loss
* RSI: RSI=100−(100/1+RS ​)