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.

2. **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.

3. **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
4. **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))
5. **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)