SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

Department of Management Studies

23BBE731 – Security Analysis and Portfolio Management

II / III SEMESTER

UNIT III : Technical Analysis

Topic: Technical Indicators- Moving Averages(SMA,EMA)

Introduction to Moving Averages

- Moving averages are statistical tools that smooth out price data by creating a constantly updated average price.
- Help identify the **direction of trends** (upward, downward, or sideways).
- Commonly used in **technical analysis** to confirm trend reversals and entry/exit points.
- Two main types:

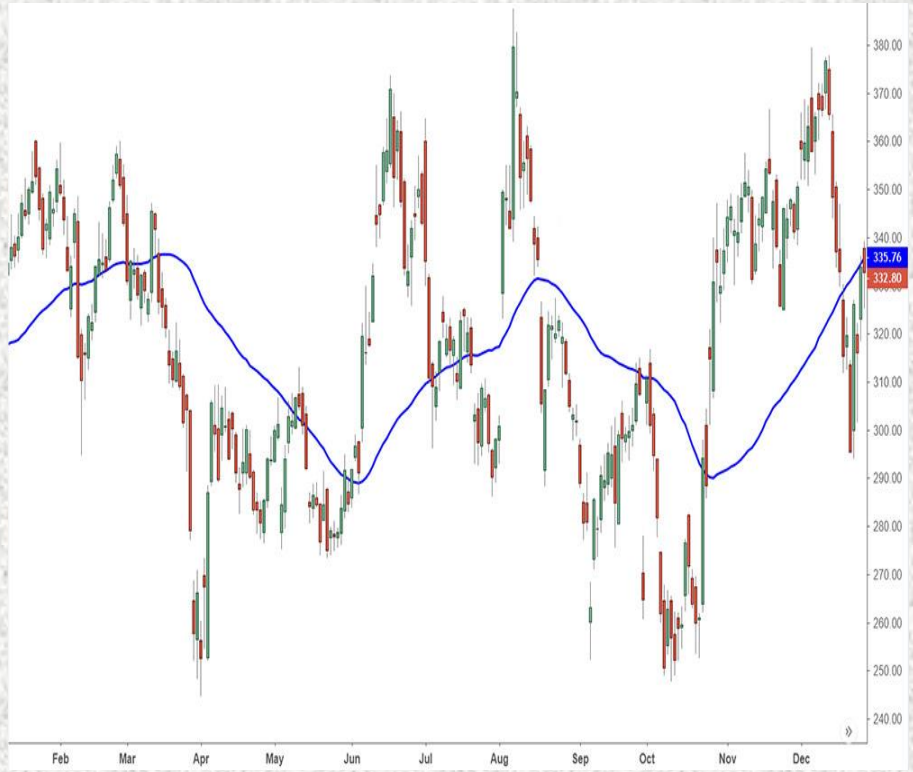
✓ **Simple Moving Average (SMA)**

✓ **Exponential Moving Average (EMA)**

Simple Moving Average (SMA)

- ✓ SMA is calculated by **averaging a set number of past prices**.
- ✓ Formula:
- ✓ SMA=P1+P2+...+PnnSMA = \frac{P_1 + P_2 + ... + P_n}{n}SMA=nP1+P2+...+Pn
- ✓ Example: A 10-day SMA adds up the last 10 closing prices and divides by 10.
- ✓ **Purpose:** Smoothens out short-term volatility and highlights long-term trends.
- ✓ **Drawback:** Lags behind current price movements.

 Useful for long-term investors who focus on steady trend direction.



Exponential Moving Average (EMA)

- ✓ EMA gives **more weight to recent prices**, making it more responsive to new information.
- ✓ Formula includes a multiplier for weighting recent data.
- ✓ Reacts faster to price changes compared to SMA.
- ✓ Common EMAs: 12-day, 26-day (used in MACD indicator).
- ✓ **Application:** Traders use EMA to capture short-term trend shifts.

 Ideal for short-term traders who react to quick price movements.

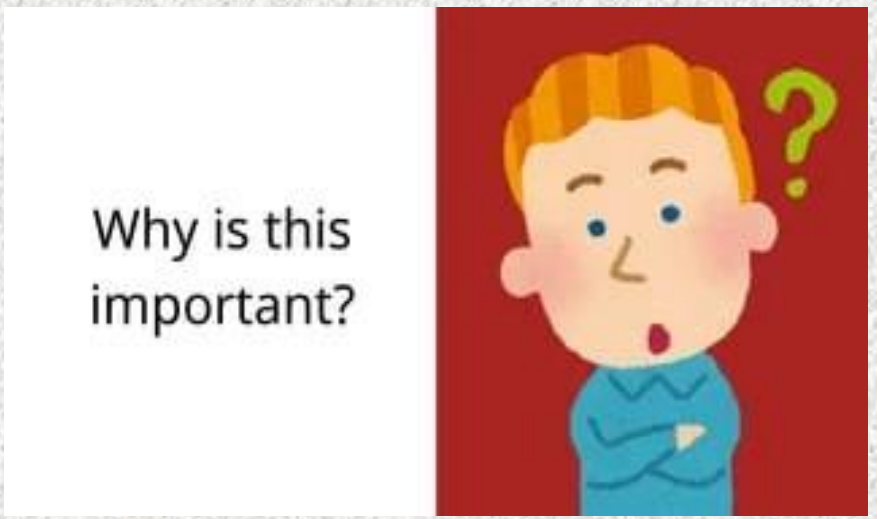
Comparison: SMA vs EMA

Feature	SMA	EMA
Weightage	Equal weight for all data points	Higher weight for recent prices
Sensitivity	Slower response	Faster response
Usage	Long-term trends	Short-term trends
Example	50-day or 200-day	12-day or 26-day

- *Both are essential tools depending on trading strategy.*

Importance of Moving Averages

- Helps identify **trend direction and reversals.**
- Used to determine **support and resistance levels.**
- Key part of many indicators like **MACD, Bollinger Bands.**
- Aids in **buy/sell decisions** (e.g., Golden Cross, Death Cross).
- Provides a **systematic, data-driven** approach to market analysis.



Integrating with Design Thinking Approach

Design Thinking Stage	Application in Moving Averages
Empathize	Understand investor needs for clear, unbiased market signals.
Define	Identify problem: market noise and confusion in price patterns.
Ideate	Develop different average models (SMA, EMA) to analyze trends.
Prototype	Apply these averages to real-time data visualization.
Test	Evaluate accuracy of SMA and EMA signals in various market conditions.

Generative AI Connection

- **AI models** can analyze massive price datasets and optimize moving average parameters.
- **AI-enhanced algorithms** dynamically adjust SMA/EMA periods for better accuracy.
- **Generative Models** can generate predictive insights, backtest strategies, and suggest trade signals.
- **AI-powered trading platforms** integrate MA-based models for adaptive decision-making.

Real-World Application

- 50-day SMA crossing 200-day SMA = **Golden Cross (Bullish Signal)**
- 50-day SMA crossing below 200-day SMA = **Death Cross (Bearish Signal)**
- Used in **stock, crypto, and forex markets** for trend confirmation.
- Example: Traders using EMA(12,26) to identify entry points in intraday trading.

References

- https://www.investopedia.com/terms/m/movingaverage.asp
- https://corporatefinanceinstitute.com/resources/capital-markets/moving-average/
- https://www.wallstreetmojo.com/moving-average/


Thank you!