



# Trading Algorithms

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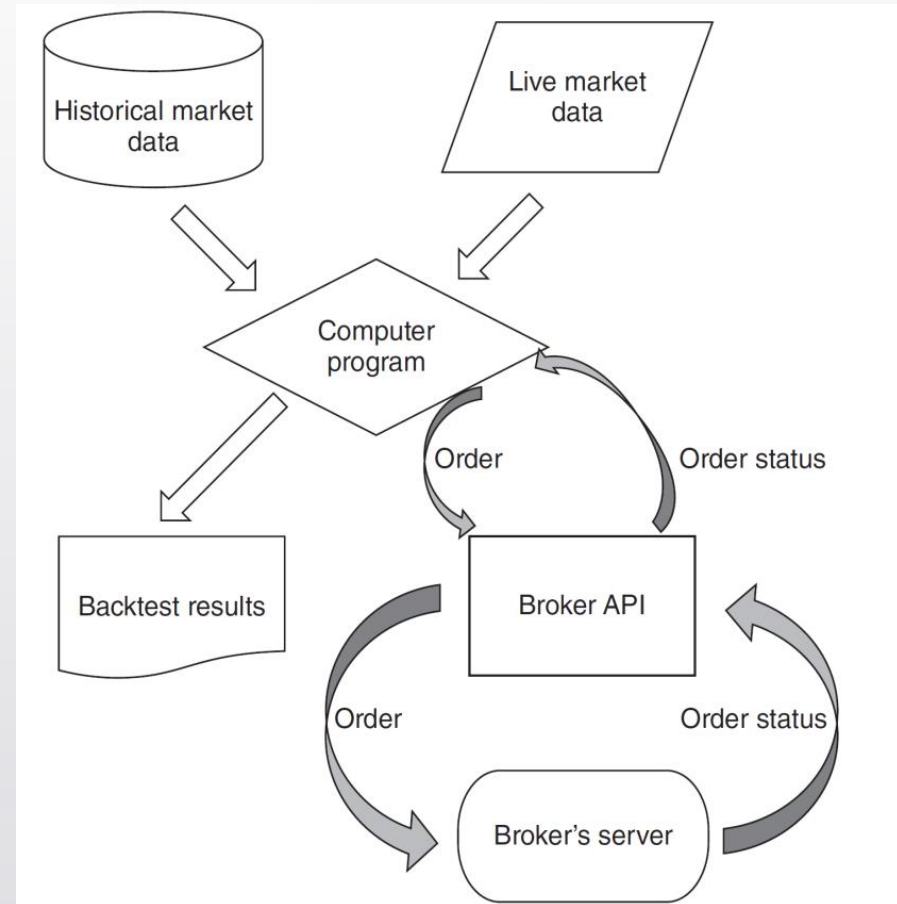


# Outlines

- automated trading
- Technical analysis
- TradingView
- Pine script

# Automated trading

**Algorithmic trading:** is the use of a program containing a set of instructions for trading purposes which is executed in a predetermined manner specifically without any human intervention.





# Algorithmic Trading: Pros and Cons

- Historical Assessment (Ability to Backtest)
- Comparison (statistical information)
- No Discretionary Input (Minimization of human emotions)
- Increased Speed (Higher Frequencies)
- More Accuracy
- Diversification (Automation of the asset selection process)

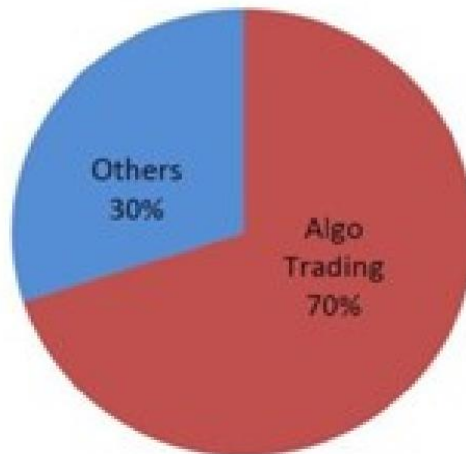


# Algorithmic Trading: Pros and Cons

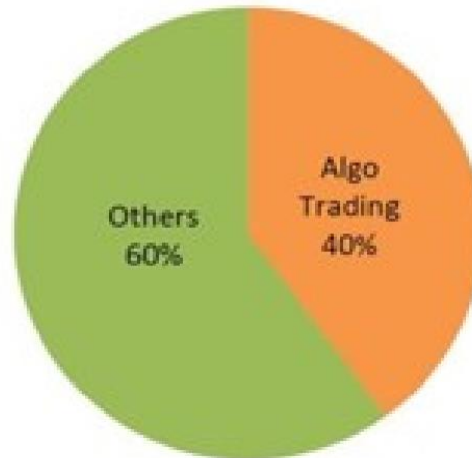
- Dependence on Technology
- Requirement of Resources
- Programming/Scientific Expertise
- Risk of Over-Optimization
- Loss of Human Control (Inability to Understand Irrational Markets)
- Short life span of the algorithms

# Algorithmic Trading

Contribution of Algorithmic Trading to current Trading Volume in US



Contribution of Algorithmic Trading to current Trading Volume in India



Contribution of Algorithmic Trading in Global Trades







# Technical analysis

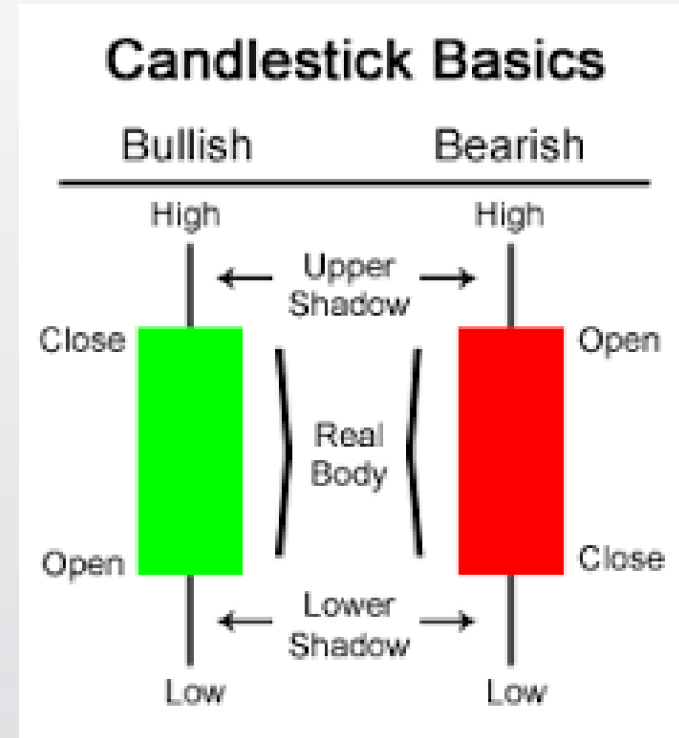
In finance, **technical analysis** is an analysis methodology for analyzing and forecasting the direction of prices through the study of past market data.

Unlike **fundamental analysis**, which attempts to evaluate a security's value based on business results such as sales and earnings, technical analysis focuses on the study of price and volume.

# Technical analysis: Candlestick patterns

There are two basic candlesticks:

- **Bullish Candle:** When the close is higher than the open (usually green or white)
- **Bearish Candle:** When the close is lower than the open (usually red or black)



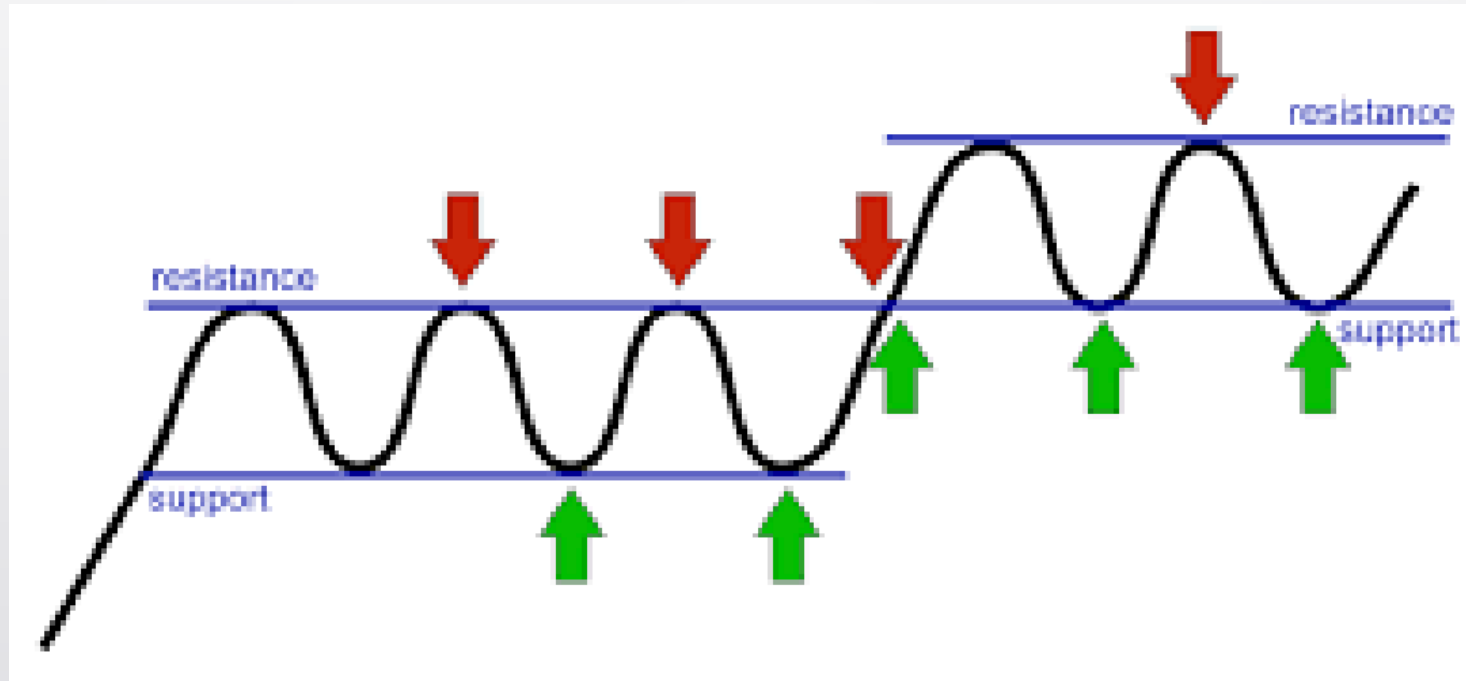


# Technical analysis: Candlestick patterns

## Doji:



# Technical analysis: Support and resistance





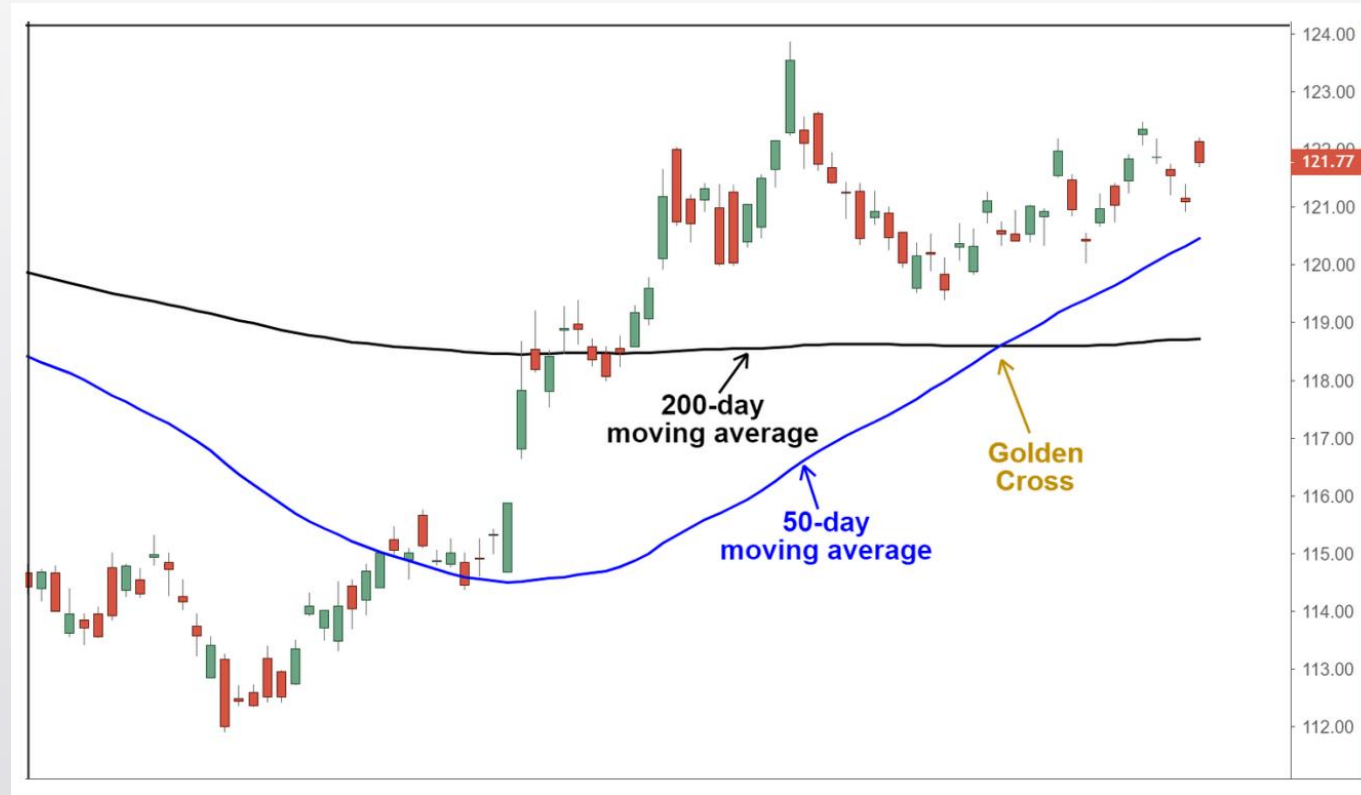
# Technical analysis: Moving Average

A **moving average (MA)** is a stock indicator commonly used in technical Analysis.

A **simple moving average (SMA)**, is calculated by taking the arithmetic mean of a given set of values over a specified period.

A **golden cross** is a chart pattern in which a short-term moving average crosses above a long-term moving average.

# Technical analysis: Moving Average





# Technical analysis: Ichimoku Cloud

The **Ichimoku Cloud** is a collection of technical indicators.

The **Ichimoku Cloud** is composed of five lines or calculations, two of which comprise a **cloud**.

The lines include a **nine-period average**, a **26-period average**, an **average of those two averages**, a **52-period average**, and a **lagging closing price line**.

The **cloud** is a **key part** of the indicator. When the price is below the cloud, the trend is down. When the price is above the cloud, the trend is up.



# Technical analysis: Ichimoku Cloud

$$\text{Conversion Line (tenkan sen)} = \frac{9\text{-PH} + 9\text{-PL}}{2}$$

$$\text{Base Line (kijun sen)} = \frac{26\text{-PH} + 26\text{-PL}}{2}$$

$$\text{Leading Span A (senkou span A)} = \frac{\text{CL} + \text{Base Line}}{2}$$

$$\text{Leading Span B (senkou span B)} = \frac{52\text{-PH} + 52\text{-PL}}{2}$$

Lagging Span (chikou span) = Close plotted 26 periods  
in the past

**where:**

PH = Period high

PL = Period low

CL = Conversion line



# Technical analysis: Ichimoku Cloud

