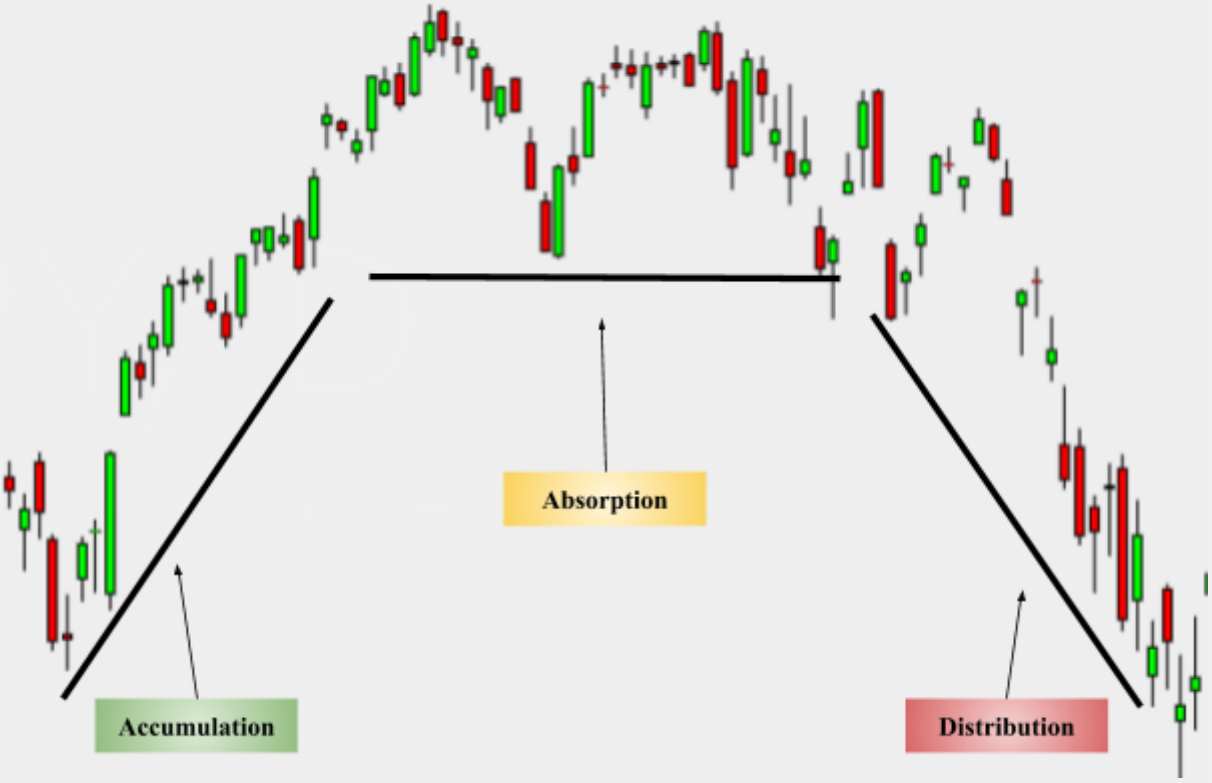
- **Technical Analysis:** the art of reading price movement over time
    - Used to predict what is likely to happen

DOW THEORY

- **3 market movements**
    - Main: long-term trend
    - Medium: intermediate-term trend
    - Short: short-term trend
- **3 trend phases**
    - Accumulation Phase: when institutions are buying
    - Absorption Phase: institutions start selling; they think stock has topped
    - Distribution Phase: institutions done selling and retail investors panic
    - Also referred to as bullish trend, consolidation, and bearish trend



- **Markets are efficient**
    - IMPOSSIBLE to beat the market
        - Someone can never know more than the market
    - POSSIBLE to outperform the market
        - Anyone can create returns that surpass the market
    - Markets discount all known information
        - Company specific; sector specific; market specific
        - Macroeconomics; microeconomics
        - Everything is already priced into the market accordingly

- **Indices must agree**
  - An index is an assortment of individual stocks; different sectors and different markets all have their own individual index
  - Indices (plural for index) must be moving in the same direction for the market to be healthy
  - Two original indices were industrial and transportation
    - If the industrials were performing well but transportation was underperforming, one can be sure that industrials will soon underperform as indices must agree
  - SPY, IWM, QQQ, DIA, VIX, and etc, will all be in agreement during normal market conditions

- **Confirmed by volume**
  - Any trend that is in the market must be confirmed by volume
  - Light volume represents lack of conviction in the marketplace

- **Newton's first law**
  - An object in motion tends to stay in motion
  - Something that has momentum is likely to keep its momentum
  - Trends are likely to continue and will do so **UNTIL BROKEN**

- Trade WITH THE TREND

CHART TYPES

- Line

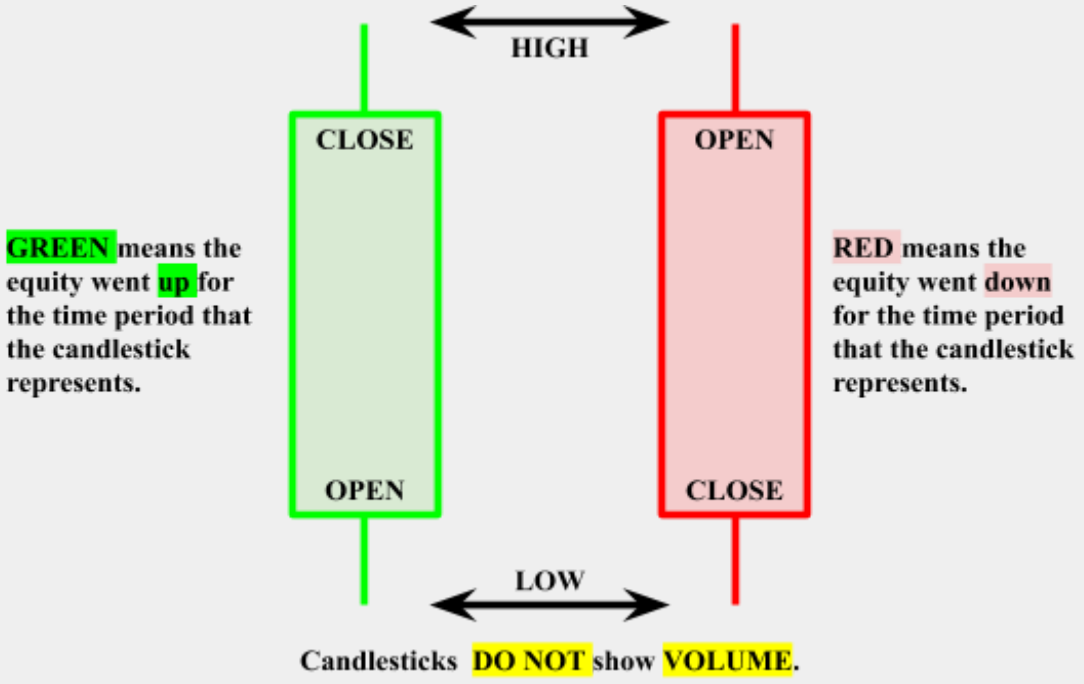
- Mountain/Area

- Bar

- Candle

- Candlesticks and are the most common chart type and are preferred over the others as they provide the most information
- Line charts and mountain charts are essentially the same
- Bar charts are basically the same as a candlestick chart except they use horizontal protrusions to show open and close as opposed to candles
    - Slowly became less popular as the market began to favor candlesticks

CANDLESTICKS



- It is possible for a stock to have a green candlestick for a down day and vice versa
    - If the stock opens down, moves up, but fails to surpass the previous day's close, then the overall movement for the day was downwards

SUPPORT AND RESISTANCE

- 1-year chart is the recommended timeframe for determining support and resistance
- Price support and resistance
    - Horizontal ceiling/floor
    - The market cares more about PRICE support and resistance
        - Will usually allow for more accurate predictions

- Trend support and resistance
    - Diagonal ceiling/floor

- Support and resistance are APPROXIMATE
    - Precision still counts but not necessarily to the penny

- Trading signals:
    - Buy/Short when support/resistance holds
    - Short/Buy when support/resistance fails
    - Trades should be placed after seeing underlying asset performance at support/resistance levels
        - Do NOT place trades when underlying asset first reaches these levels

- When a stock breaks resistance, the old resistance is likely to become the new support
- When support is broken, a stock is likely to find support at the next/lower support levels; the old support(s) are like to become resistance that the stock may have face in a previous uptrend
- Uptrend: support more important than resistance
- Downtrend: resistance more important that support

- **Trend Recognition**
  - Uptrend: higher highs and higher lows; at least two highs and two lows
  - Downtrend: lower highs and lower lows; at least two highs and two lows
  - Sideways: no definite pattern
  - Use a timeframe longer than the trading window to identify the overall trend
    - **Multiple timeframe analysis** uses timeframes separated by approximate factors of 4, 5, or 6 (1 hour, 4 hours, 1 day)
      - Trading window is 4 hours in the example

*Pay attention to what's happening within the context of the **longer term market movement.** Look at indices first. If the market is going down, most stocks are going down.*

- Not everything is trending
  - If there are only higher highs without higher lows, or vice versa, or if no new highs and lows are being made: the TREND IS UNDETERMINED
  - Every trend has AT LEAST TWO highs/lows

CHART PATTERNS

*All chart patterns may experience a retest after completion. This is the market testing to see if the new support/resistances will hold. Trading the pattern without waiting for a retest is considered **aggressive (win big but win less often)** while trading on the retest is considered **conservative (win less but win more often)**.*

Continuation Patterns: continue the previous trend

- Triangles
  - Ascending Triangle: bullish continuation pattern
    - Features a flat resistance and an upwards moving support; support will eventually breakout through resistance
    - **Entry Points**: along support line, at breakout, or at retest

- Descending Triangle: bearish continuation pattern
  - Features a flat support and a downwards moving resistance; resistance will eventually breakdown through support
  - **Entry Points**: along resistance line, at breakdown, or at retest

- Cup and handle
  - Takes several weeks to months to set up
  - Almost EXCLUSIVELY BULLISH pattern
  - Bullish trend goes into cup and handle and back into bullish trend
  - Very popular among fundamental analysts
  - **Entry Points**: breakout

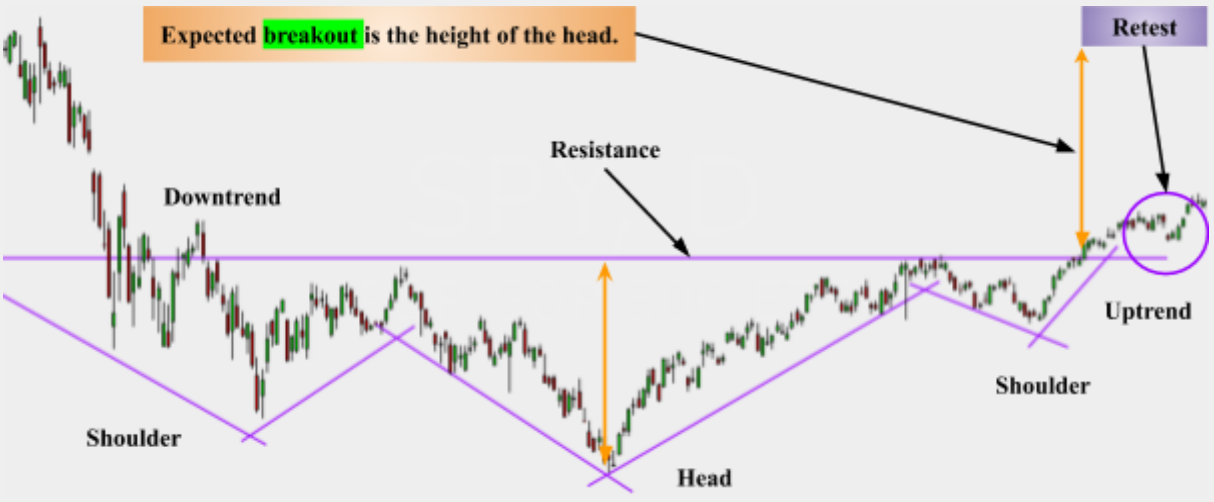
Non-directional Patterns: no obvious trend; neither continuation or reversal

- Consolidating Triangle
  - NON-DIRECTIONAL consolidation pattern
  - Features an upwards moving support and a downwards moving resistance
  - **Entry Points**: breakout/breakdown

Reversal Patterns: reverse the previous trend

- Double top/bottom
  - Features a flat support/resistance and two tops/bottoms respectively
  - The double top experiences a retest more often than the double bottom
  - Tops and bottoms DO NOT have to be equal; double bottom is shown below

- Head and shoulders
  - Usually takes several weeks to months to set up
  - Features a flat support with three peaks; center peak being slightly higher than the adjacent two
  - There is an inverse head and shoulders, which appears during reversals of a bearish trend which will be shown below instead of the head and shoulders
  - **Entry Points**: breakout or retest



Notable Details Regarding Chart Patterns

- There are hundreds of patterns out there; only a few are shown here
- Chart patterns can fail and often do
- Different patterns can be seen by different people with the same chart

    - The head and right shoulder of the head and shoulders chart can also be interpreted as a **CUP AND HANDLE**
- Every chart pattern comes down to the same thing: **SUPPORT AND RESISTANCE**

VOLUME

- **Volume:** shares of the equity traded within a given timeframe; usually daily
- **Theory:** confirms the trend; volume is needed to keep the trend alive
- **Reality:** theory holds true in a downtrend, not so much in an uptrend
    - The market naturally goes up as there are always buyers; there cannot always be sellers because only so much can be sold before nothing is left to sell
    - People need reason to sell more than they need reason to buy
- Volume spikes during bear markets
    - Buyers are always trading but now the sellers are trading as well
    - The market crashes much faster than it rises
- Continuation of a downtrend **REQUIRES** strong volume
    - You can recognize when a equity is bottoming out because volume starts to go down and when the equity begins going up; only buyers are left

TECHNICAL INDICATORS

- Keep it simple
- What I see in the CHART OVERRULES anything an indicator may be saying
- Indicators are designed to HELP READ THE CHART
- Four popular indicators: Moving Averages; MACD; Stochastic; Bollinger Bands
- Indicators can be an upper indicator or lower indicator
    - Appear on the chart and below the chart respectively

Moving Averages

- Used for trend recognition, support/resistance, and crossovers
- Works well on TRENDING equities; TRENDING INDICATOR
- **DOES NOT WORK** on non-trending equities
- Provides excellent entry/exit signals in the form of crossovers

- Questions to consider regarding moving averages
    - What is the trend of the underlying equity?
    - Should moving averages be used?

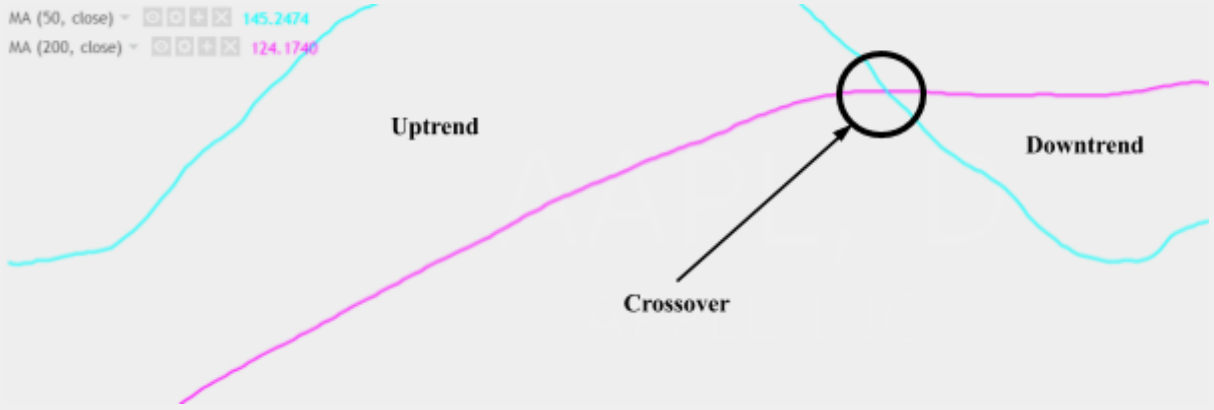
- **Example of a simple moving average on an equity**
  - Here it confirms an uptrend in its respective timeframe as the equity is trading above it and has also acted as a support level in the past

- 3 MOST POPULAR moving averages: 20-day, 50-day, and 200-day
  - Although moving averages default in days, they can also be displayed in different **TIMEFRAMES**
  - When trading currencies, it's not uncommon to see the same moving average setup except instead of it being defaulted in days, the moving averages might be 20-hours, 50-hours, and 200-hours

- **Two types of moving averages**
  - **Simple (SMA):** tallies up the last number of timeframes that it's been set to and averages them
  - **Exponential (EMA):** tallies up the last number of timeframes that it's been set to and averages them with greater emphasis on the most recent days

- Most SMAs use an 8-day EMA as control which will swing the tail in the direction of movement shown in the previous timeframe
  - This results in a slight skew in the most recent part of the SMAs
  - SMAs will point the same direction as the most recent day's movement

- **Trend Identification**
    - When the shorter timeframe SMA, often referred to as the faster SMA as it reacts more to the current day's changes, is above the longer timeframe SMA, often referred to as the slower SMA as it reacts less to the current day's changes, the trend is considered an uptrend



    - Moving average crossovers indicate a change in trend; hence they are also trading signals; **trade in the direction of the NEW TREND**
- Generally, the 20-day and 50-day are used as crossover indicators
    - When the 20-day crosses above the 50-day, it is considered a buy signal
    - When the 20-day crosses below the 50-day, it is considered a sell signal
    - If the 20-day crosses the 200-day, it is considered a major shift in trend
    - Long term trades should use longer term moving averages
        - 20/50 crossover should not be used for a trade lasting several years
- The length of time between moving average crossovers is not nearly as important as important as the angle between the crosses; a sharper angle cross is a much stronger signal than a shallow angle cross

NOTE: It is important to note the timeframes of the SMAs in the above figure. Although there were many entry and exit signals, all but one were successful in getting into the trade at the right time (third crossover from the left). This is due to the underlying equity consolidating, thus making SMA crossovers an unreliable indicator. **Every indicator has it's own purpose and it's recommended to play to an indicator's strengths.**

MACD

- Stands for: Moving Average Convergence Divergence
- Built on the idea of moving averages
- Best used in a trending market
- Has several different uses

- Default settings on the MACD are: (12, 26, close, 9) as shown in the top left hand corner of the above image
- 12 and 26 are the length of two EMAs
- The MACD is the 12 EMA minus the 26 EMA
- Close stands for the data used to compute the 12 and 26 and is the most popular out of all 4 choices
    - Can be changed to open, high, or low depending on personal preference
- 9 is the length of the EMA which is used as the signal line

- Trading signals:
    - When the MACD crosses above the signal line, it is considered a buy signal; the opposite is true for a sell signal
- Histogram shows the difference between the MACD and the signal line
    - Above the zero line when the MACD is above the signal line and below when vice versa
    - Indicator of momentum of a stock: positive momentum correlates to upwards movement in the underlying equity and negative momentum correlates to downwards movement in the underlying equity

    - **CAUTION:** All technical indicators are lagging and will hence always have a delay between the signals and the underlying equity movement
- Can also be used to identify trend; usually a MACD of a higher timeframe will be used to identify trend change in a smaller timeframe
    - MACD line above zero line, trend considered bullish
    - MACD line below zero line, trend considered bearish
- Additional notes:
    - Behaves similarly to moving averages and thus, the same rules apply
    - Histogram tends to take a certain shape allowing investors to get in prior to the actual signal provided by the MACD
    - A good time to buy could be when the MACD reads a bull trend with bearish momentum - potentially a dip

Stochastic

- Range bound oscillator between 0 and 100
    - Below 20 means stock is oversold (cheap)
    - Above 80 means stock is overbought (expensive)
- Measures supply and demand via overbought and oversold status
- Best used in non-trending markets
    - Most effective on a range-bound stock (consolidation)
- Faster than the RSI using traditional settings for both
    - Moves more than the RSI and also tends to respond first to chart movements

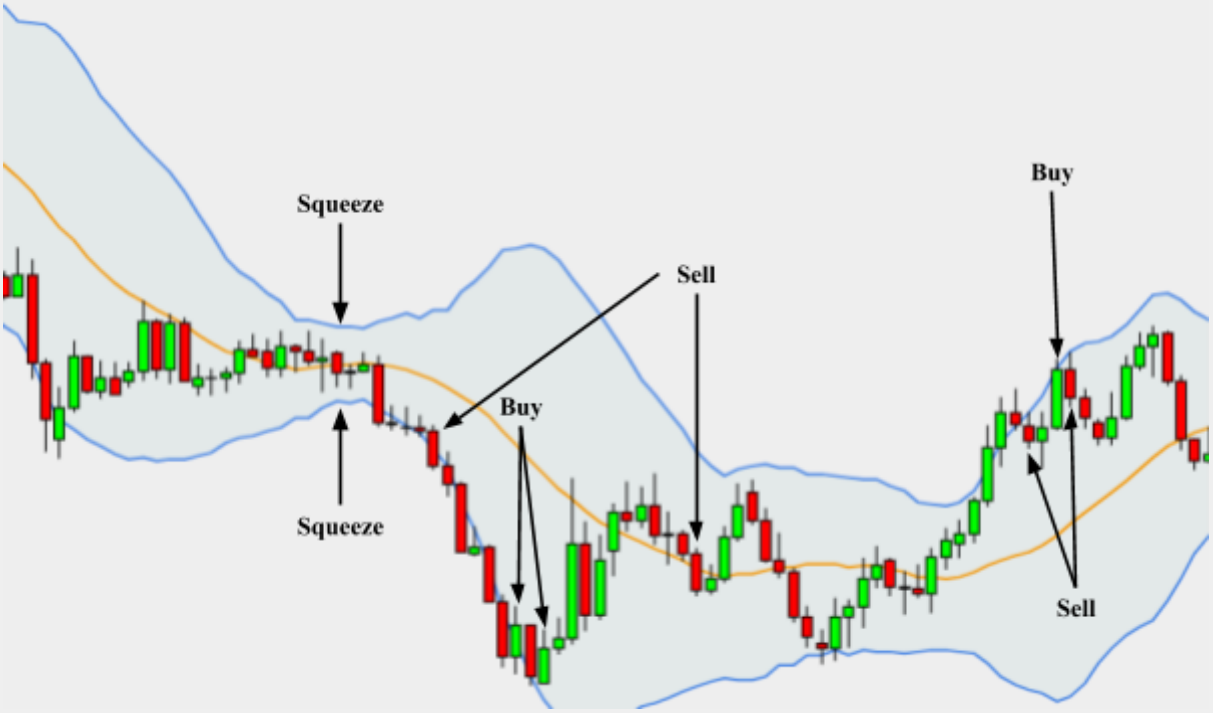
- Default settings on the Stochastic are: (14, 3, 3) as shown in the top left hand corner of the above image
    - 14 represents the %K which compares closing price to price range
        - Covers 14 periods and thus is a lagging indicator
    - The other two numbers can be %D or smoothing factor for the %K
        - Orientation order changes based on platform
    - %D is the moving average of the %K and appears as the smooth line
    - Smoothing factor of 1 is considered fast while 3 is considered slow

- Trading signals:
    - When the %D crosses above 20, it is considered a buy signal
    - When the %D crosses below 80, it is considered a sell signal
    - The %K can be used instead of the %D if a fast stochastic is preferred
    - The slow stochastic tends to produce more accurate, but fewer, signals
    - %K and %D are effectively moving averages and can be used as such
- Buy/Sell signals can signal the end of a Down/Up trend respectively

- Mathematics behind %K, Smoothing factor and %D
    - %K = (today's close - low)/(high - low)
        - High and low are those associated with the period
        - Not visible on the indicator
    - Smoothing factor is the number of %K values used for an average
        - This is seen on the indicator as the choppy line
    - %D is the number of smoothed %K values used for an average
        - This is seen on the indicator as the smooth line

Bollinger Bands

- Do NOT give directional prediction
- Sometimes considered a technical system based on the available strategies
- Measures volatility based on mean reversion theorem
    - Can be combined with other indicators for predicting high momentum directional movements



- Default settings on the bollinger bands are (20, close, 2) as shown in the top left hand corner of the above image
    - 20 is the moving average and timeframe used
    - 2 is the number of standard deviations covered
        - 95% of market movement occurs between the bands
- Trading Strategies:
    - Non-trending approach for a consolidating market
        - Buy signal when the stock exits the lower band and re-enters
            - Sell signal is when the stock crosses above the moving average and crosses back below the moving average (usually 20 or 30 depending on the bollinger settings)

            - If the stock passes through the bottom band again before crossing the moving average, sell and re-enter after the stock comes back into the band
        - Opposite rules apply for the upper band (short trades)
    - Bollinger band squeeze
        - Preferred moving average length of 20
        - Short signal when the stock exits the band after the squeeze
            - Cover signal when the stock re-enters the band
        - Opposite rules apply for upper band (long trades)
        - Combine with MACD for a directional prediction

TECHNICAL SYSTEMS

- Understand the long term trend and trade the short term signals
    - Identify support/resistance
    - Determine the trend
    - Use technical indicators to identify trades
- Confirm that the system works historically for the equity of choice
    - Not every system works for every stock or market

- 3 signal system
    - Involves the use of 3 types of indicators
        - Usually 2+ SMA, MACD, and Stochastic
    - Works best on non-trending or long-trending stocks
    - Good way to identify the beginning of a new trend
    - This system is a directional system
        - Gets you into the trade at the beginning of a new trend
    - Trading strategy:
        - All three indicators must agree
        - Enter a trade when 2+ indicators fire off the same signal (maximum 1 day apart) and the remaining indicator is in agreement
        - Exit when all three indicators disagree on the long-term trend OR when one one indicator disagrees for the short-term trend

- In the above image
  - 50/200 SMA bearish crossover
  - MACD negative momentum fires off 1 day later
  - Stochastic is neutral so sell opportunity is identified
  - Exit on disagreement of any indicator
- If this system does NOT give buy/sell signals, consider making a sideways bet

- Guppy system
  - Uses only moving averages
    - Works best for trending stocks
  - Gauges short-term sentiment versus long-term trend
    - Does NOT work in non-trending markets
  - Consists of two guppies
    - Fast guppy - 3, 5, 8, 10 ,12, and 15 period SMAs
    - Slow guppy - 30, 35, 40, 45, 50, 60 period SMAs
  - Trading strategy:
    - Buy signal when fast crosses over slow guppy (opposite for sell)
    - Stay in the trade provided the stock stays above the fast guppy
      - Guppy also needs to be close together
    - Exit when stock dips below fast guppy for more than 2 days (opposite for sell) or the guppy system gives the opposite signal from entry

- In the above image
  - All the buy/sell signals are generated when the guppies cross
  - Exit signals are generated when the stock dips below the fast guppy for more than 2 days (because the previous signals were buys)

- Additional notes on technical systems
  - Recommended to do a top-down analysis due to the short term nature of trades
  - Backtest strategies prior to implementation
  - Highly recommended that trades are confluent with the long-term trend
  - Stick to the same stocks/industry
  - Risk management is key for minimizing losses