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AI-generated content may be incorrect.

Hmm / ml develop machine learning generate alpha generate , from noisy data incorporate, processing,

Requirements: data source -process data from multiple sources, crypto

How to find Strategies:

1. Strategies idea/Assumptions (build and work on the idea)
2. Hypothesis (something to prove)
3. Converting into formula
4. Backtesting & permutations
5. Forward testing & equity

Include:

Assumptions (why we came out these strategies?)

Summary:

MVP:

Need more data and combine, test the assumptions (2-3), backtest (refer to the github) – process of function get output (metrics), compare different set of data

Diagram:

Now is all focus on data, less on actual backtest, less signal generation stage, what models are we using?

Presentation Slide:

Assumption and came out more ideas - What should I test? Volatility/??

How should we do the backtest? Modelling

Assumption, what should test, how should we do the backtest

**Assumptions:**

1. Volatility (higher price – lower price)

Formula:

A math equations and formulas

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References:

**Volatility Reflects Market Sentiment or Risk**

**Assumption**: Larger daily price range (high - low) indicates higher volatility, which could reflect uncertainty or transition periods between market regimes.

**Test**: Test the relationship between volatility (measured by the range of prices) and market movements to understand if higher volatility correlates with increased market sentiment (fear/uncertainty) or risk.  
You can test whether increased volatility tends to cause more significant price moves or if it leads to mean reversion after large moves.

**Data Needed**:

* **High Price**: Highest price within a given time frame (typically daily).
* **Low Price**: Lowest price within a given time frame (typically daily).
* **Open Price**: Opening price of the asset.
* **Close Price**: Closing price (may also be useful for volatility and trend analysis).
* **Volume**: Trading volume during the period to understand if the volatility is supported by higher trading activity.

**Example Test**:

* Calculate daily **price range** as High - Low.
* Compute **historical volatility**: Use standard deviation of returns over a rolling window (e.g., 10 days, 30 days).
* Test if higher daily ranges correlate with larger price movements on the next day (e.g., regression of price movement on volatility measures).

**Statistical Approach**:

* **Volatility Clustering Test**: Use a GARCH model (Generalized Autoregressive Conditional Heteroskedasticity) to model time-varying volatility and test for periods of high volatility clustering.

**2. Trading Volume Is Related to Price Movement**

**Assumption**: When the market is more active (higher volume), the price is more likely to move significantly, reflecting trader sentiment and interest in reaction to news or events.

**Test**: Test if high trading volume precedes significant price movements (e.g., up or down), which could reflect changes in market sentiment or reaction to specific news/events.

**Data Needed**:

* **Volume**: Trading volume during the period.
* **Price Change**: Daily return or price change (Close - Open or Close - Previous Close).
* **Price Levels**: Open, High, Low, Close for calculating price changes.

**Example Test**:

* Create a **volume-price correlation** to analyze how volume changes are related to price movements.
* Test if **spikes in volume** (compared to the rolling average of volume) lead to large price moves in the subsequent period (up/down).
* Use **price-to-volume ratio** to analyze price moves in relation to the volume increase.

**Statistical Approach**:

* **Regression Analysis**: Perform linear regression where the dependent variable is price change and the independent variable is trading volume.
* **Granger Causality Test**: Check if high trading volume “Granger-causes” price changes, meaning it can predict future price movements.

Summary:

 **Volatility**:

* High, Low, Open, Close Prices
* Volume
* Historical price data for volatility analysis

 **Volume-Price Relationship**:

* Volume
* Close, Open, High, Low Prices for price changes
* Volume spikes for event-based trading

**Momentum Based on Time Frame (Longer Interval Confirmation)**

**Assumption**: A breakout or price movement in a smaller time frame (e.g., 15-minute interval) can be considered more reliable when confirmed by the trend in a larger time frame (e.g., 1-hour or 4-hour interval).

**Test**: Test if a price move in a smaller time interval is more likely to succeed when it's in the same direction as the trend in a longer interval.

**Data Needed**:

* **Interval Data**: Different intervals (e.g., 15 minutes and 1 hour).
* **Price Data**: Open, Close, High, Low.
* **Volume Data**: To confirm strength.

**Example**:

* A **bullish breakout in a 15-minute** interval may be confirmed if the trend is also **bullish in the 1-hour interval**.
* A **bearish breakout** in a **15-minute** interval might be confirmed if the **1-hour interval** is showing a bearish trend.