Hummingbot

Hummingbot is open source software that helps you build market making and arbitrage bots that run on any crypto exchange, centralized or decentralized.

Hummingbot can run on Windows or MacOs as well as Raspberry Pi or even with the help of Docker. The easiest way to access it without facing any installation process is to visit the Test-Drive page.

Hummingbot prioritizes centralized exchanges compared to decentralized. There are a lot of centralized exchanges in hummingbot to trade but only a few decentralized exchanges. But one can run multiple bots on multiple exchanges with different pairs of currencies. Hummingbot has 9 strategy configurations that can be used for trading or liquidity mining. You have the option to save a strategy configuration after every bot creation, allowing you to reuse a strategy quickly with 'import' command + strategy_filename.yml.

Basic Concepts -

Order Book: An order book is the list of orders that an exchange uses to record the interest of buyers and sellers for a particular financial market. A matching engine uses the book to determine which orders can be fully or partially executed

Liquidity: The order book is very liquid when a great amount of orders is stored in each buy and sell side of the order book. In such a situation a market order produces only a small price adjustment. On the contrary, if the order book is not liquid, there are only a few orders on the buy and sell side and there is a very large average gap in price between adjacent orders. In this case, even a market order with a small volume can produce a dramatic price fluctuation of several ticks. Markets perform better when they are more liquid.

Limit orders: A limit order is an order that you place on the order book with a specific limit price. The limit price is determined by you. The trade will only be executed if the market price reaches your limit price (or better). Therefore, you may use limit orders to buy at a lower price or to sell at a higher price than the current market price.

Market orders: A market order lets you purchase or sell a financial asset instantly at the best price currently available. Market orders take prices from limit orders on the order book. This means you can't be 100% sure of the price you will get. Slippage can occur when you get a price different from what you expected.

Bid-Ask Spread: The bid-ask spread is the difference between the highest price a buyer is willing to pay for an asset and the lowest price a seller is willing to accept. These prices are reflected as bids and asks on an order book, placed by market makers as limit orders. Price takers will place market orders to buy or sell an asset, and in doing so they accept the best bid or best ask determined by the market maker. In Hummingbot, the bid_spread is the % how far from the mid price you want your buy orders are placed. While ask_spread is for your sell orders. Mid price is not the price that you see in the middle of the orderbook - that's the last trade price.

Mid price is the average price of the best bid and ask.
Which means:
mid_price = (best_bid + best_ask) / 2
And your order prices are calculated as follows:
hbot_bid_price = mid_price * (1 - bid_spread)
hbot_ask_price = mid_price * (1 + ask_spread)
Slippage: Slippage is financial loss during trading as a result of market inefficiencies and illiquidity. Slippage occurs when an illiquid market experiences a sudden, large change in demand or supply, resulting in losses for the buyer or seller.

Market Makers vs Market Takers -
Market Makers: Market Makers add liquidity to an exchange's order book by placing limit orders, or orders to buy or sell at a specific price that is not immediately filled. Makers place orders that are not immediately matched by an existing order. Without limit orders sitting on an order book, there would be little liquidity for a given pair as an exchange would be trying to match buy and sell market orders as they are placed. These Market Makers are crucial for maintaining price stability, as they fill up an order book with limit orders at different levels. Makers are typically rewarded with lower fees for providing liquidity to the market in the form of buy/sell limit orders.
Market Takers: Market Takers take liquidity, as in they place market orders to immediately buy or sell. Market orders are orders to take the best available price in the current market. Takers take the price that they want and in doing so, they are "taking" volume off of an order book. They place orders that are filled immediately by buy or sell orders already sitting on the books. Taker market orders are designed to never land on an exchange's order book, as they are filled by the exchange's matching engine as they are placed. Thus, taker fees are typically higher because their orders are filled immediately.

To be continued
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