

STEP-BY-STEP FLOW

Step 1: Load and Clean Transaction Data

- **Tasks:**
 - Connect to the MongoDB database.
 - Retrieve relevant transaction records (buy/sell events, timestamps, wallet addresses, gas fees, amounts, etc.).
 - Clean the data by removing any invalid or incomplete entries, and standardize field names/formats for analysis.

Step 2: Identify Sniper/Bot Wallets

- **Detection Criteria (a wallet is labeled "sniper" if it meets all the following criteria):**
 - Uses **high gas fees** > 0.000002 ETH) to prioritize transaction confirmation.
 - Makes **large trades** (transaction value $> 100K$ tokens).
 - **Sells quickly** after buying (within 20 minutes).
 - **Trades frequently** within a short time window.
 - Executes a **buy transaction within seconds** of a token launch or **within the next 100 blocks** after a token launch.

Step 3: Calculate Profit & Loss for Identified Wallets

1. Use FIFO Matching (First-In, First-Out)

- When a user sells tokens, we match the sold tokens against the oldest buys first.
- This helps us calculate how much the user originally paid for the tokens being sold.

2. Track Buy Information

For every buy transaction, the following is stored:

- **amount_received:** Tokens actually received after tax (this is what goes into the wallet)

- **amount_paid_for:** The amount of tokens the user paid for before tax
- **buy_price:** The token's price at the time of buy
This data is stored in a queue.

3. When a Sell Happens

From the sell transaction, we know:

- **amount_from_wallet:** Tokens that left the wallet (before tax)
- **amount_sold_net:** Tokens that were actually sold after tax
- **sell_price:** The price at which the tokens were sold

4. Matching Sell Against Buys

The sell amount is matched against the queue of previous buys:

- Take the oldest buy from the queue
- Determine how much of that buy is being used in the current sell (based on **remaining_to_match**)
- Calculate the ratio of the matched amount to the original buy
- Use this ratio to find:
 - **Cost Paid** = (matched portion of tokens) × (original buy price)
 - **Proceeds Received** = (matched portion of sale) × (sell price) × (amount_sold_net ÷ amount_from_wallet)

5. Calculate PnL

For each matched portion:

$$\text{PnL} = \text{Actual Proceeds from Sale} - \text{Original Cost Paid}$$

This is accumulated to compute the total realized PnL.

Step 4: Display Transactions and Metrics in an Interactive Table

- **Recommended Tool:** Streamlit
 - Use a scrollable, searchable table to display wallet addresses, trade details, P&L, and sniper flag.