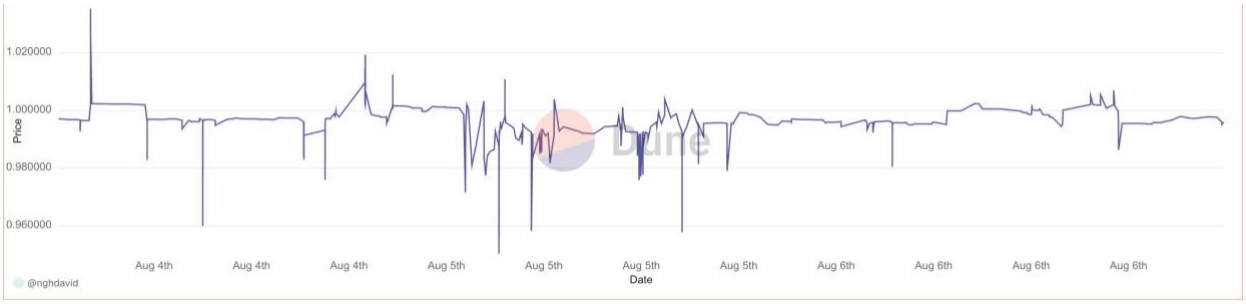
The code is at github: https://github.com/nghdavid/tokenomics-assignment

Question 1.1

stETH/ETH on Uniswap V2

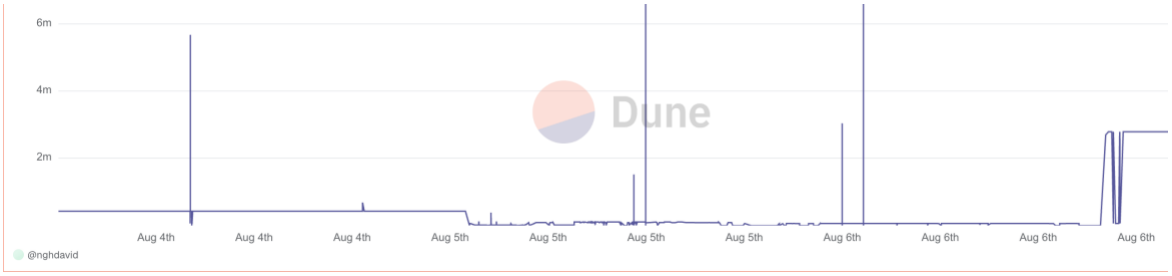


stETH/ETH liquidity

Question 1.2

ezETH/ETH price

ezETH/ETH liquidity



ezETH was depegging, the liquidity was withdrawn on Aug 5th.

Question 2.1

0.590938841ETH is being sent into the pool

1,024.23 USDC is being taken out of the pool

Question 2.2

No.94 among 121 transactions within that block

Transaction pool (mempool): Pending transactions sit in the mempool after being broadcast.

Block proposer (miner/validator): The entity responsible for building the next block selects which transactions to include.

Ordering: The proposer decides the order of transactions inside the block. They usually prioritize:

Gas price / priority fee: Higher fees often get placed earlier.

MEV: Proposers or relays may reorder, insert, or exclude transactions to maximize profit.

Index inside the block: Once finalized, the transactions are stored sequentially (e.g., tx[0], tx[1], tx[2]…) in the block.

Ordering matters because transaction effects are state-dependent:

State conflicts:

If two transactions touch the same contract or storage slot, the one that comes first can affect the outcome of the later one.

Example: Two swaps against the same Uniswap pool. The first one changes the price; the second sees a different price.

Question 2.3

```
def simulate_uniswap_v2_swap(
    amount_in: float,
    token_in: int,
    reserves: Tuple[float, float],
    fee: float,
) -> float:
    reserve0, reserve1 = reserves
    reserve_in, reserve_out = (
        (reserve0, reserve1) if token_in == 0 else (reserve1, reserve0)
    )
    amount_in_with_fee = amount_in * (1.0 - fee)
    return (amount_in_with_fee * reserve_out) / (reserve_in + amount_in_with_fee)
```

Question 2.4