Web3 and Blockchain Basics: Setup Wallet and Explore Dapps

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Domain: Blockchain
Difficulty: Beginner
Testnet Used: Sepolia
DApp Used: Uniswap (Testnet)
Started Date: 30 October 2025

1.Blockchain Basics Summary:

Blockchain is a decentralized ledger technology where data is stored in blocks and distributed across a global network. Each block is chained to the previous one, creating an immutable sequence. Core concepts include:

• Distributed Ledger Technology: No single point of control, increasing security and transparency.

• Consensus Mechanisms: o Proof of Work (PoW): Miners solve puzzles to validate transactions. o Proof of Stake (PoS): Validators are chosen based on their coin holdings.

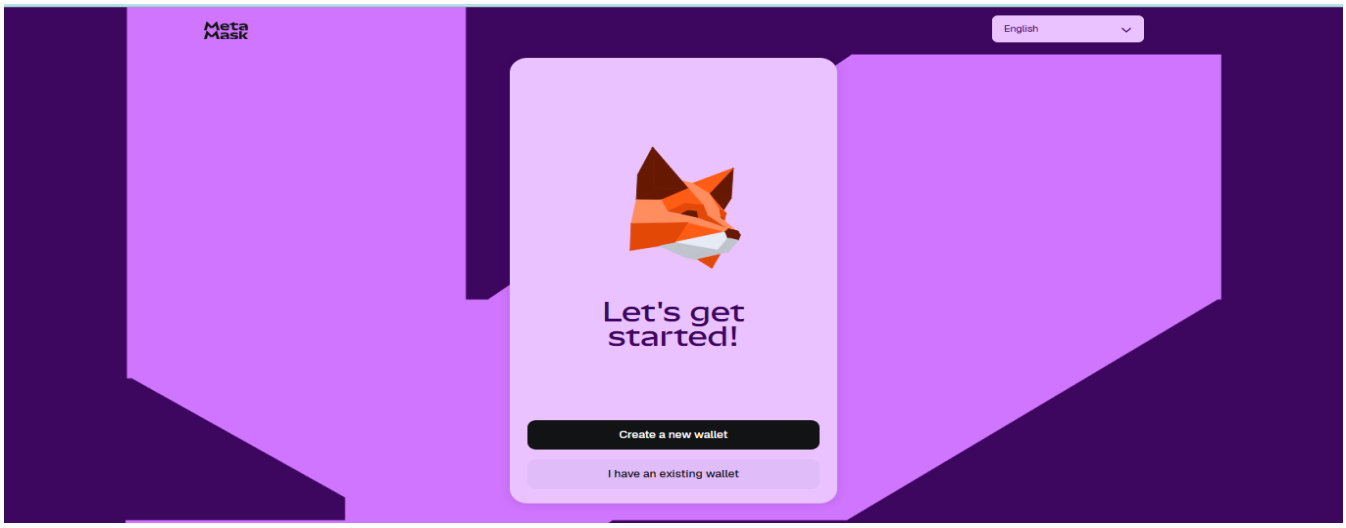
• Cryptography: Public/private key encryption ensures secure, verifiable transactions.

2. Documentation (Screenshots and Proof of Work)

Step 1: MetaMask Installation

✅ Description: Installed MetaMask browser extension from https://metamask.io

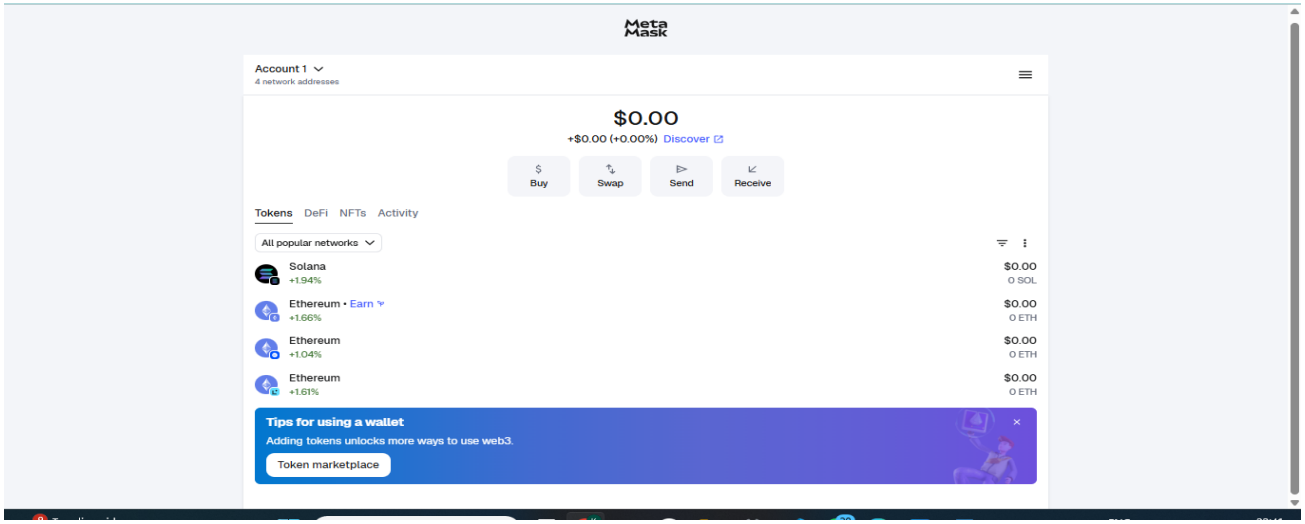
📸 Screenshot 1:



Step 2: Wallet Creation

✅ Description: Created a new wallet and backed up my secret recovery phrase offline.

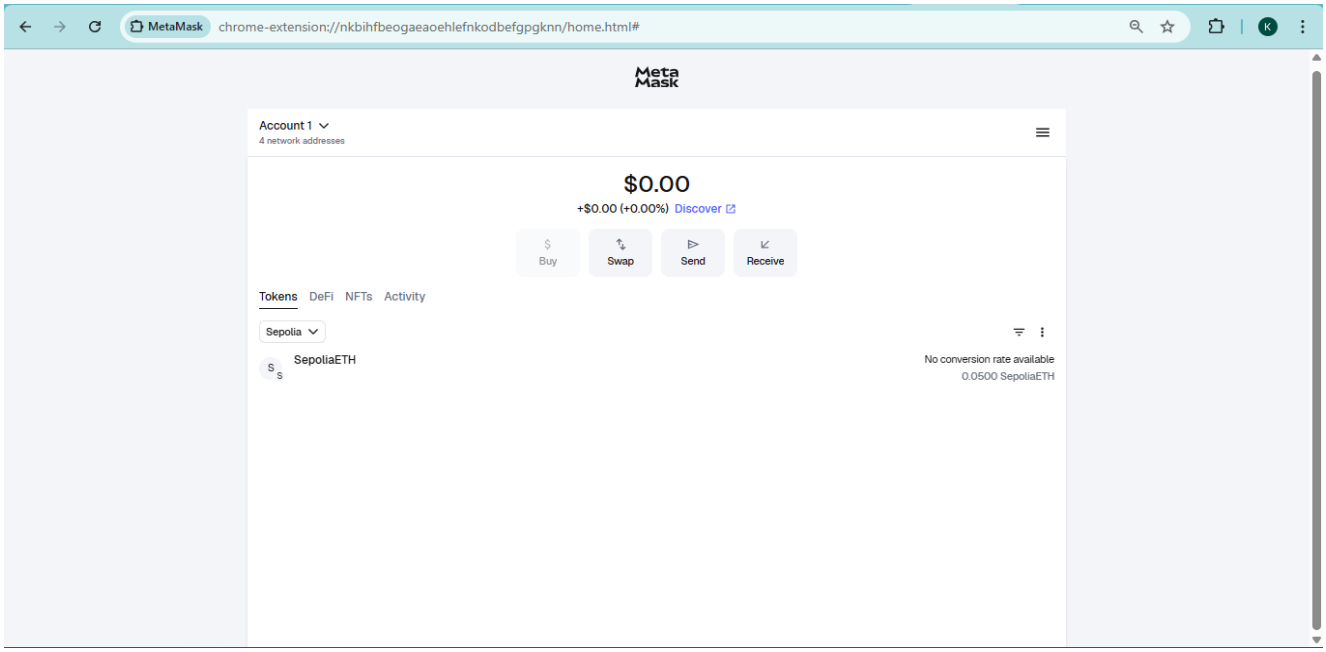
📸Screenshot 2:



Step 3: Connect to Ethereum Testnet (Sepolia)

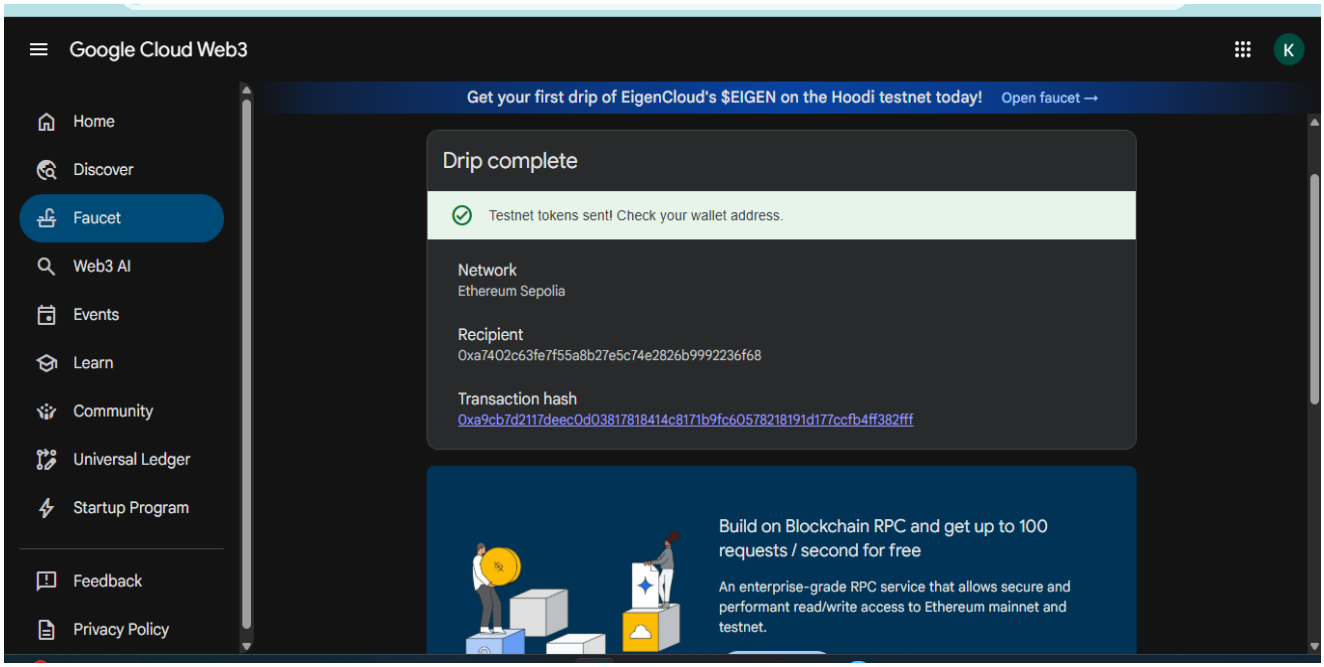
✅ Description: Configured MetaMask to use the Sepolia Test Network under settings → advanced → show test networks.

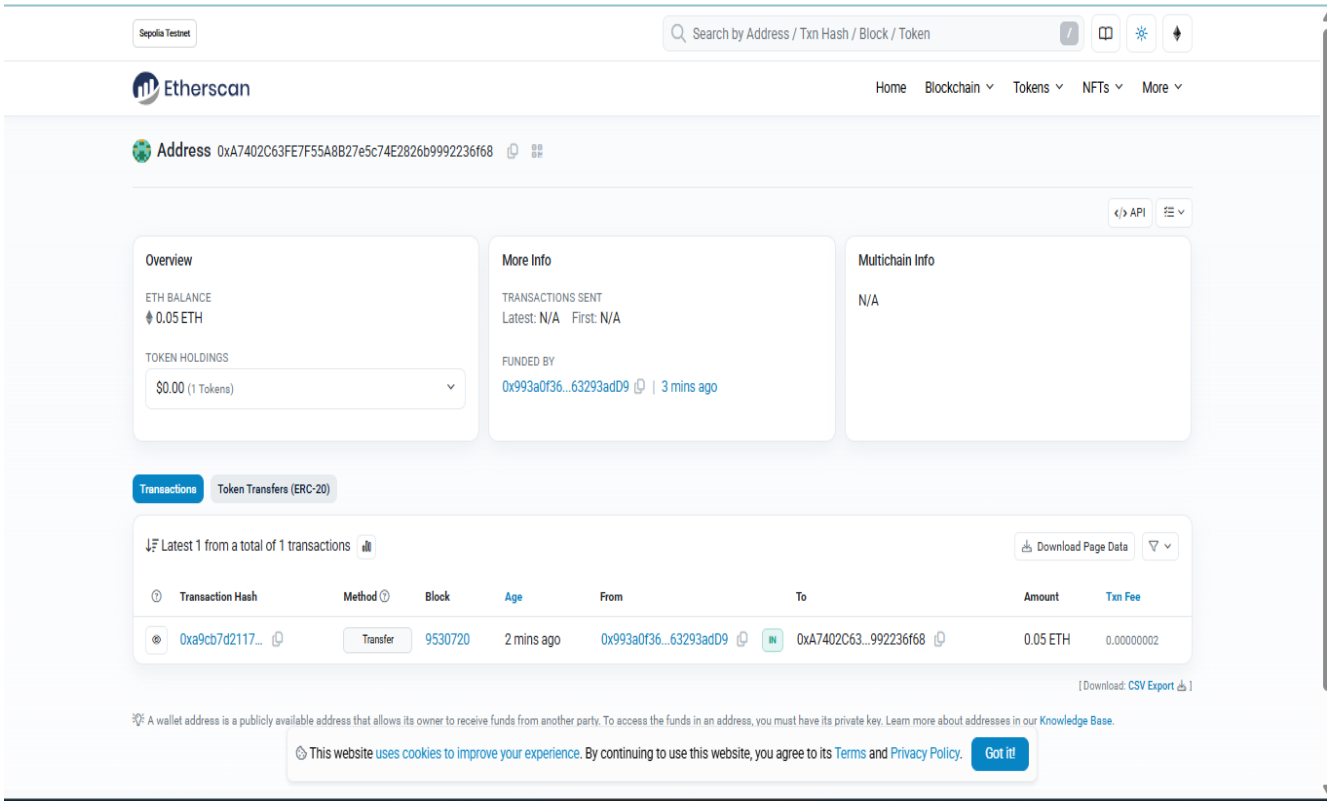
📸Screenshot 3:



Step 4: Obtain Testnet ETH

✅ Description: Visited a Sepolia Faucet and requested testnet ETH. Verified the transaction on Etherscan.

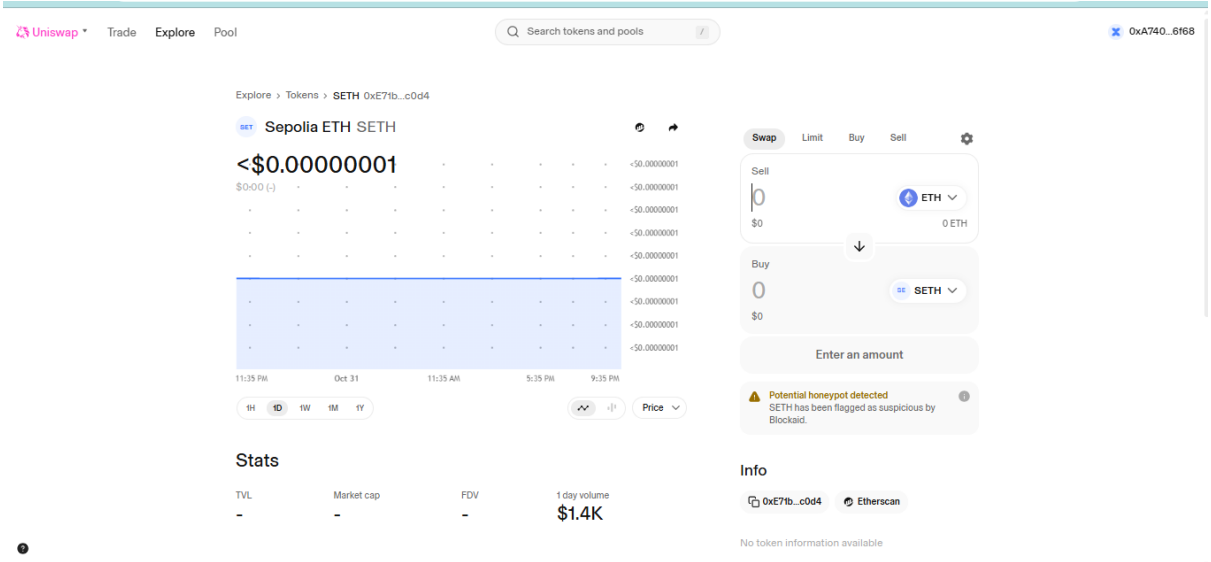




Step 5: Connect Wallet to DApp

✅ Description: Connected my MetaMask wallet to Uniswap Testnet.

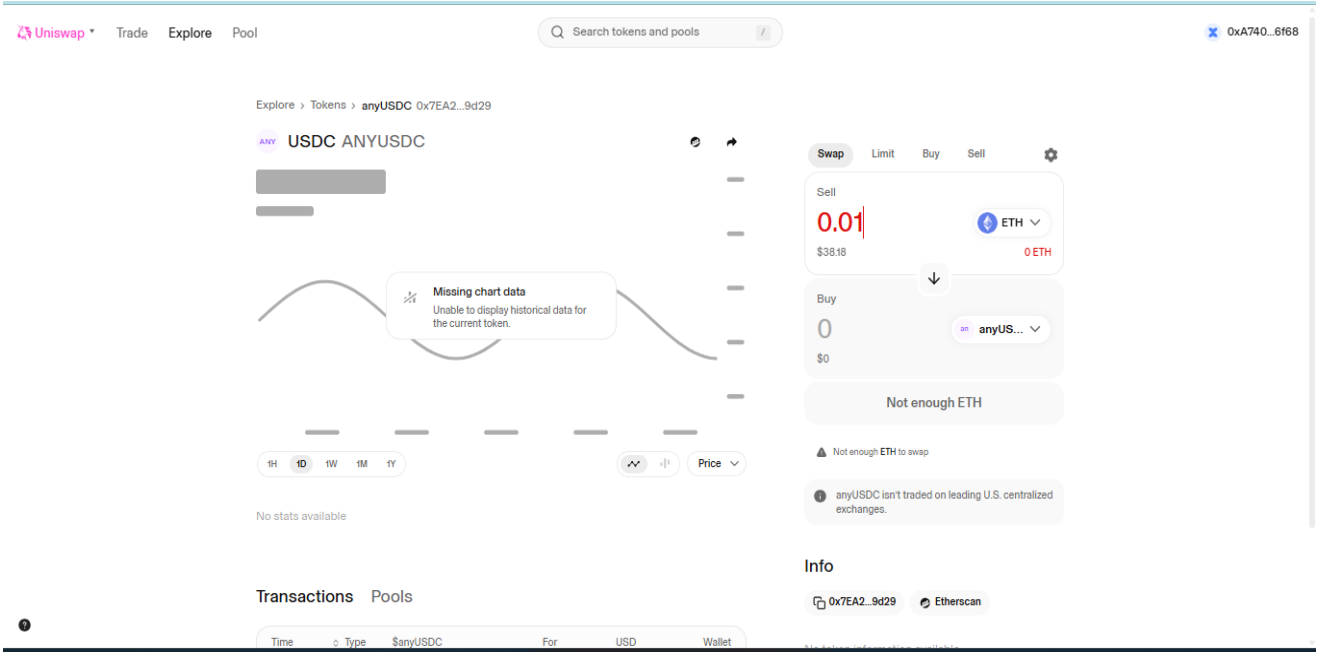
📸 Screenshot 5:



Step 6: Perform a Token Swap

✅ Description: Swapped testnet ETH → testnet USDC using Uniswap interface.

📸 Screenshot 6:

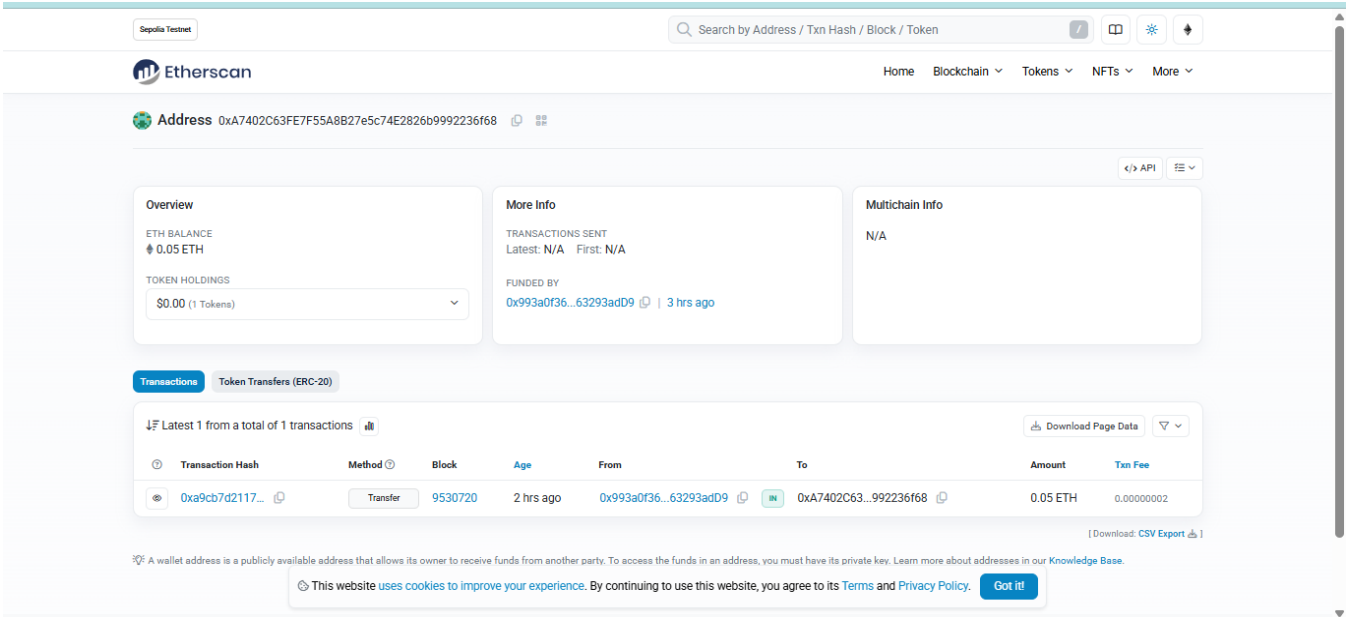


Step 7: Verify Transaction

✅ Description: Checked my transaction on the Sepolia Etherscan explorer.

- **Transaction Hash:** 0x_____
- **Etherscan Link:** https://sepolia.etherscan.io/tx/0xYourTxHashHere

📸 Screenshot 7:



3. Reflection :

It is a decentralized, distributed ledger that stores transactions across various computers. This makes the blockchain transparent, immutable, and secure. Different from typical databases, which rely on a central authority to manage, record, and validate data, blockchain encompasses a network of nodes operating collectively to reach consensus on transactions using consensus algorithms such as Proof of Work and Proof of Stake. This decentralized nature has made such systems resistant to tampering, censorship, and single points of failure.

In this project, I came to know that blockchains allow trustless transactions via smart contracts: self-running computer programs that automatically execute on meeting their predefined conditions. Smart contracts remove the need for intermediaries in a transaction and guarantee the execution of all transactions precisely as programmed, with no human intervention or interference. I realized how big an impact this concept is transforming industries like finance, supply chain, and gaming, which involve a lot of transparency and automation.

The process of setting up MetaMask helped me understand how crypto wallets serve as gateways to the blockchain ecosystem. MetaMask not only stores private keys securely but also enables users to sign and approve transactions directly from their browser. Managing the

seed phrase was an important reminder about wallet security — losing it means losing access permanently. I also learned about verifying official URLs and avoiding suspicious sites or extensions to prevent phishing attacks.

Interacting with Uniswap on the Sepolia testnet really drove home the difference between centralized Web2 applications and decentralized Web3 platforms, where the user owns their assets and identity in Web3, whereas web2 companies control access to data and users. All transactions occurred transparently through smart contracts that were deployed on-chain via Uniswap, with no middlemen necessary. I saw precisely how on-chain execution was done when I swapped ETH for USDC.

Observing the gas fees and transaction confirmations was also an insightful experience. Even though the testnet uses free ETH, it accurately simulates real-world blockchain conditions such as varying gas prices and network congestion. Every transaction required explicit approval in MetaMask, reinforcing how users must consciously sign actions on Web3 applications. Viewing my transactions on Etherscan deepened my understanding of block explorers, showing how each transaction contains detailed information about sender, receiver, gas usage, and block confirmation. A major part of the challenges included faucet delays and network mismatch errors while connecting my wallet to the testnet. Changing faucets and manually reconnecting Sepolia solved this. Generally, this practical experience provided very good foundational knowledge in blockchain architecture, Web3 concepts, wallet management, and smart contract interaction. This makes me confident to explore advanced-level blockchain development and DApp creation in the future.

⚙ 4. Technical Summary:

Item	Description
Testnet Used	Sepolia
DApp Used	Uniswap (Testnet)
Transaction Type	Swap ETH → USDC
Wallet Address	0xa7402c63fe7f55a8b27e5c74e2826b9992236f68
Transaction Hash	0xa9cb7d2117deec0d03817818414c8171b9fc60578218191d177ccfb4ff382fff

Item	Description
Block Explorer Link	https://sepolia.etherscan.io/tx/0xa9cb7d2117deec0d03817818414c8171b9fc60578218191d177ccfb4ff382fff
Faucet Used	Sepolia Faucet (Alchemy / Chainlink)
Errors Faced	Faucet delay, DApp not connecting initially
Troubleshooting	Used alternate faucet, manually selected Sepolia network
Learning Outcome	Understood blockchain, wallet security, smart contracts, and DApp transactions