**Reflection**

Building this mini blockchain gave me a **practical understanding** of hashing, immutability, and the Proof-of-Work (PoW) mechanism. I learned that a block’s hash is derived not only from its own data but also from the previous block’s hash. This linking ensures that even a small modification, such as changing a transaction amount, invalidates all subsequent blocks — clearly demonstrating the concept of **immutability**. It was insightful to see how quickly a manipulated chain fails during verification.

Implementing PoW helped me understand how **computational security** is enforced in blockchains. By requiring the block’s hash to begin with a specific number of leading zeros, miners must perform numerous hash computations before finding a valid solution. Increasing the difficulty from **3 to 5** caused a significant rise in **nonce values** and **mining time**, showing how PoW directly controls the cost and difficulty of tampering. To alter a blockchain, an attacker would need to **re-mine all subsequent blocks** faster than the rest of the network, which is practically infeasible.

I was especially surprised by how **resource-intensive** even a simple blockchain can become. With only five blocks and a difficulty of 5, my CPU usage spiked noticeably. This made me realize why real-world blockchains like **Bitcoin** require powerful mining hardware. Additionally, I understood the importance of **consensus mechanisms** — without PoW, anyone could easily modify the chain.

Overall, this project gave me a **deeper appreciation** of how hashing, immutability, and PoW work together to ensure the **security, trust, and decentralization** of blockchain networks.