Mini Blockchain Explorer - Documentation

1. Introduction

The Mini Blockchain Explorer is a Python-based application that demonstrates the basic principles of blockchain technology. It allows users to create a simple blockchain, add blocks of data, validate the chain's integrity, and even simulate tampering with a block to observe the effects on the chain's validity.

2. What is a Blockchain?

A blockchain is a decentralized and distributed digital ledger that stores data in blocks, which are linked together using cryptography. Each block contains a timestamp, transaction data, and a hash of the previous block, forming a chain that is secure and transparent.

3. How to Use the Mini Blockchain Explorer

1. Run the Application: Execute the Python script to start the Mini Blockchain Explorer.
2. Add Blocks:
    - Enter data into the "New Block Data" field.
    - Click the "Add Block" button to create a new block and add it to the blockchain.
3. Validate Chain:
    - Click the "Validate Chain" button to check the integrity of the blockchain.
    - A message box will appear indicating whether the chain is valid or invalid.
4. Tamper with Block:
    - Click the "Tamper with Block 1" button to simulate modifying the data of the first block (after the genesis block).
    - This action will demonstrate how tampering affects the chain's validity.

4. Expected Output

- Blockchain Display: The main window displays the blocks in the chain, showing their index, timestamp, data, previous hash, and hash.

- Validation Result: A message box indicates whether the blockchain is valid or invalid after validation.
- Tamper Alert: A message box warns that block data has been modified when tampering is simulated.

5.Notes

- This is a simplified demonstration of blockchain concepts.
- The application uses SHA256 hashing for block security.
- The "Tamper with Block 1" function simulates data modification for demonstration purposes.