README

Files included :

node0.py, node1.py (Nodes at port 5000, 5001 respectively)

Requirements to be installed:

● Flask==0.12.2: pip install Flask==0.12.2

● Postman HTTP Client: <https://www.getpostman.com/>

● requests==2.18.4: pip install requests==2.18.4

Programming Language Used: Python (Version: 3.9)

Project Description:

This Project aims at efficient and secured handling of data at hospitals. This data includes sensitive information, which may include personal as well as medical details of a patient. This data needs to be secured, because the loss of any such data, or unauthorized access to it may cause a breach in the appropriate medical treatment of the patient.

This problem can be handled using Blockchain Technology, to ensure security and privacy of data.

* Transaction will consist of patient details namely:

* Patient\_Id
* Patient\_name
* Age
* Admit\_date
* Diagnosis
* Insurance\_number
* Only the authorized entities ,ie, doctors can create a transaction pertaining to a patient and add block to the blockchain, and access the data.
* No other person is  allowed to access the information.
* Miner performs proof of work to find special token x,which when combined with block data produces a SHA-256 hash with 4 leading zeros.

* During validation ,miner node and validator node use a **Zero-Knowledge proof** method to carry out validation.
* If validation is successful,the block will be added to the blockchain

STEPS TO RUN THE PROGRAM:

1. Execute python files node0.py and node1.py in two different terminals

$Python node0.py

$Python node1.py

This assigns port 5000 and 5001 to our program, which now will act as 2 nodes in blockchain

1. In postman, set connections between these 2 nodes by running

GET request <http://127.0.0.1:5000/make_connections> with json body {"nodes":["http://127.0.0.1:5001"]}

GET request <http://127.0.0.1:5000/make_connections> with json body {"nodes":["http://127.0.0.1:5000"]}

1. To add transaction, use

POST request http://127.0.0.1:5000/add\_transaction

with json body as

{

    "Patient\_Id": "003",

    "Patient\_Name": "Aman Jain",

    "Age": "22",

    "Admit\_Date": "02-04-2022",

    "Diagnosis": "Hepatitis-B",

    "Insurance\_Number": "XAEO202"

}

1. To mine block , use GET request <http://127.0.0.1:5000/mine_block>

This internally calls proof of work function and verify function, which performs zero-knowledge proof

1. To view transactions made by a certain node, use GET request <http://127.0.0.1:5000/view_user>

This lists all transactions that this particular node made

1. You can Repeat above steps with different port numbers in the request URL (5000,5001) to make them miner and the other node automatically acts as a verifier