Lab 5 Assignment

In this final lab, you will implement a solution for a bank to handle all the transactions made by clients. The bank maintains three servers to handle the received clients transactions.

The transactions are stored on a Blockchain, which is used as a Database by the bank. The blockchain is replicated on the three servers to ensure fault-tolerance. The Proof of work is used as the underlying consensus protocol.

The clients and servers have known identifiers (for instance, 1, 2, 3 for clients and A, B, C for the servers). The clients are supposed to contact, concurrently, one randomly chosen server to submit a transaction.

The transaction format follows the UTXO model as described in Lab 4.
Once a server receives three valid transactions, a block is created and broadcasted to the other servers. Once a block is validated and included to the blockchain, the client will receive a notice about his current balance.

The program should first read an input text file to initialize the blockchain. This file consists of a set of transactions in the form (sender receiver amount). We assume that each client starts with 1000 units. This means that in the genesis block, there is a transaction with a NULL input and outputs, for the three clients, with the value 1000.

While running the program, an output text file is created to keep track of the effect of the transactions that have been added to the blockchain. The file format is as follows :

T1: Alice Bob 50
Alice 950
Bob 1050

T2: Bob Charlie 20
Bob 1030
Charlie 1020
…….