Distributed Operating System, COP5615
Project 4 – Blockchain Simulator
Fall 2018

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Execute blockchain-simulator.zip:
1. Unzip the folder into your workspace
2. Traverse to directory blockchain_simulator
3. Run: mix deps.get
4. Run: mix compile
5. Run: mix test

Additionally, the project can be executed from iex as follows:

To run: iex -S mix
Start the miner: Blockchain.Miner.start_mining()
Stop the miner: Blockchain.Miner.stop_mining()
Check the chainstate: Blockchain.Chain.get_state()
To check the wallet amount: Blockchain.Wallet.check_amount(public_key)

What is implemented:

1. Blockchain
2. Wallets
3. Transactions
    a. Standard Transactions
    b. Transaction verification
4. Mining
    a. Difficulty
    b. Proof of Work
5. Signatures (ECDSA to sign transactions)
6. Incentive
7. Common Standard Blockchain Protocol
    a. Hashes
    b. Merkle Trees
    c. Addresses
8. Security

a. Unauthorized spending
b. Double spending
c. Payment verification

Test Cases shown in the report:(details explained in the report)

1.Mining a block and adding it to the chain.
2.Mining a block and its not added to the chain.
3.Transaction with a valid digital signature
4.Transaction with invalid digital signature
5.Sending an amount greater than current balance
6.Sending an invalid amount of coins.