

Design Document HW2

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In our source code we use 11 python files and modules such as numpy, random, simpy, matplotlib, datetime, networkx, csv and hashlib. A brief information of the 11 files are given below:

- 1) **graph.py**: It is creating a graph which has all the required properties with minimum 3 other nodes and maximum of 6 nodes connected to it.
- 2) **networkproperties.py**: It is having an object of the network which is calling a method called create_nodes which is creating nodes and adding nodes into the nodes_list variable. Overall it creates the nodes accordingly as given in the problem statement as low/high CPU and fast/slow, 2 selfish nodes and selfish_nodes list selected while creating the network. It also has an lvc variable which is longest visible chain.
- 3) **node.py**: In this there is a transaction class and a node class. Transaction classes have different parameters as the one required. In node class we have the parameters and data structures which are used by a node, that is a genesis block, transaction list, blockchain, block queue and selfish queue (which is only used when the node is selfish).
- 4) **block.py**: It is having a block class which defines the structure of the block object.
- 5) **plot.py**: it is simply saving the topography of the network.
- 6) **transmitttransactions.py**: In this a node creates a transaction in exponential time distribution with the mean of Tx.
- 7) **transmit transactions.py**: In this a node is sending the transaction, which it creates to its neighbouring nodes.
- 8) **createblocks.py**: In this the nodes create blocks depending on the interarrival time and hashing power. It does this by checking the transactions in the blocks.
- 9) **handleblocks.py**: in this we are handling blocks by transmitting them according to the latencies, updating the longest value chain, and adding the blocks from the block queue. Checking whether transactions are valid.
- 10) **checktransactionqueue.py**: It is used to simulate latencies for transmitting the transaction from one node to another.
- 11) **main.py**: This is the main file which is used to create the environment to run the blockchain simulation. The variously asked command line parameters are given as parameters in this file.