**COP5615 Project 1 : Bitcoin Mining**

# Kalpana Sathya Ponnada: 52461920 - Tharun Bhupathi: 83289089

# Input

# N is an integer value which represents the number of leading zeroes in the hashed string , should be given as input to the program and the program finds a string that outputs a string that has N number of leading zeroes in it.

# Output

For a given integer N which represents the number of leading zeroes in the hashed string, the output is a hash value having N number of leading zeroes.

# How To Run

**Run Server**: server:start\_server(<N>)

Text

Description automatically generated

**Run Client:** client:start\_client(<IP\_Address>)

**Text

Description automatically generated**

**Work Flow:**

1. First, Create a Server node as shown below **- server@<IP\_Addr>**



1. Then, run server with an input of No. of Zeros (say 4).

**Text

Description automatically generated**

1. The server starts mining coins as shown above.
2. **Now, To add a Client node:**
3. First, Create a Client node as shown below **erl -name client**



1. Now, run the client as mentioned below **- Client:start\_client(<Server\_Ip\_Addr>)**

Text

Description automatically generated

1. Similarly Multiple Clients can be invoked**.**

# Size of the work unit for each worker

Each actor will search for a random string of random length between 1 and 25, where allowed characters are lower case alphabets and integers from 0 to 9.

# Output for 4 zeros

N = 4 and prefix is UF Gator link ID kponnada

Text

Description automatically generated

# Number of actors giving the best performance

For a server, without any client connected : 150

With Multiple Clients connected : 15 actors for a 2core server machine. More than 15 actors will affect the communication and cause timeout.

**The CPU time and real time for above program**

To calculate the CPU and real time, we have introduced the below piece of code at start and end of the execution. The difference between these two gives the respective times.

statistics(runtime)

statistics(wall\_clock)

**In the below snippet, the CPU and real: start and end times were shown**

Total CPU time = ~32000ms, Real time = ~16000ms , Performance ratio is ~2

Text

Description automatically generated

Text

Description automatically generated

# The coin with the most 0s program managed to find

No of zeros : 7, ran on Intel Mac 8GB RAM, 2 Core machine

Text

Description automatically generated

# The largest number of working machines you were able to run your code

No of machines: 4