CSP 701: Assignment 2_2(CHORD DHT)

Implementing basic CHORD Distributed Hash Table

Implement a chord DHT over various nodes in the network. The program should be able to store data pertaining to a peer to peer network in an efficient manner. There will be two basic parts in this assignment. One is **WHERE** to store data and another is **HOW** to retrieve a data. This should be done all in peer to peer fashion. (Do not have any master/server node or ***"0"*** marks awarded)

Chord DHT must support a simple command-line user interface. Each instance (running on different machines or on the same machine on different ports) will run an RPC server and act as an RPC client. Although, you may skip RPC and do it with socket programming (no compulsion of using RPC server/client).
Deliverables are:
(1) help : Provides a list of command and their usage details.
(2) port <x>: Listen on this port for other instances of the program over different nodes.
(3) create : creates the ring.
(4) join <x>: Join the ring with x address.
(5) quit: Shuts down the ring.
(6) put <key> <value>: insert the given <key,value> pair in the ring.
(7) get <key>: returns the value corresponding to the key, if one was previously inserted in the node.

Also, in papers and online tutorials, you will find that ***"ipaddress"*** is being hashed by SHA1 to create a node ID in the ring. But, here you need to hash ***"ipaddress:port"*** as we may run several instances in one system only with different port numbers.

You all should use your own thread library function while developing DHT. In case of use of **pthreads**; you will be penalized. So, in case when you are not sure about your ***"thread.h"***, you can use **pthread.h** with penality**.**

Bonus Modules(Extra credits):

1. finger: a list of addresses of nodes on the ring.
2. successor: an address of the next node on the ring.
3. predecessor: an address of the previous node on the circle
4. dump: display all information pertaining to calling node.
5. dumpaddr <address>; display all information pertaining to node at address.
6. dumpall: All information of all the nodes.

Details of CHORD DHT is given in following paper:
http://pdos.csail.mit.edu/papers/ton:chord/

Also, few other references are:
http://www.youtube.com/watch?v=kXyVqk3EbwE (for naive)
http://www.cse.iitd.ac.in/~srsarangi/csl8602014/docs/chord-lec.pdf (advanced)
http://www.youtube.com/watch?v=qqv4OJ5Lc4E (advanced)