**ASSIGNMENTs FOR NETWORK LAB**

1. Consider several autonomous networks are connected by set of routers. Model the system architecture using graph theory. Each router maintains a routing table basically containing destination address, hopcount, address of next router. Each router can share the routing tables of its neighbourhood to update routing table using distance vector routing algorithm. Using C programming develop the following.

* While building the topology, construct each autonomous network as single node which represents set of addresses (i.e. Addresses contained by that network). Record all networks and their addresses in separate file which is consulted by your application program to determine if an address belongs to a particular network. Add provision to distinguish a router and ordinary node within autonomous network.
* Distinguish the network administrator and an ordinary user. To track the administrator and ordinary users you can use separate file to store list of users (including administrator), their login ids, passwords, their status, and access rights. If necessary, add account management features like create new user, delete on user, change password etc. The access of that file is restricted to administrator only.
* Develop a dedicated function Create\_Topology () to create topology of the networks and routers taking necessary data from network administrator.
* Develop Init\_RT() with necessary argument(s) to initialize routing tables. You can keep the entries of routing table in a file and allow it to be shared to another router only when it resides in the neighbourhood. Only administrator has the right to initialize routing table.
* Develop Update\_RT() with necessary argument(s) to update routing tables . Only administrator has the right to update routing table.
* Build a function Display\_RP() that accepts message digest containing message, source node, Destination node on above mentioned network and print the sequence of the routers during communication from source to destination. A user (not necessarily administrator) has the right to use this function using its login id and password.

1. Consider the topology of network (mentioned in QNo1) reconfigures at regular interval. Some routers are being set up and some are getting down.

* Develop dedicated function Reconfigure\_Topology() that takes the permission from network administrator only to update topology. Clearly, when you reconfigure any topology do necessary management to initialize and rewrite entries of routing table. Again use a message digest and determine its routing path by Dispaly\_RP () function call with necessary argument(s).
* As an administrator provide provision to reconfigure the topology regularly and allow user to send message digest. Use dedicated function Record\_Data () to record the following data into a file whenever any user sends a message. Only administrator has the right to display entire dataset or can find a particular record.

1. Record number
2. Current Topology
3. Message digest
4. Routing path
5. User Name