**Project Report**

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We have implemented the project in such a way that machines are stored in circular linked list in which there are other nodes as well. Routing tables are implemented as doubly lined list and the data inside the machines is stored in an AVL tree. Our circular linked list is a Ring DHT. We have used MD5 library for hashing purpose in which we are passing the IP address of machines and the hash function gives us a key.

We have stored the data of the machine in a function named insert in which we are passing the line number of the file and path of the file as we were required to do. For deletion of node of avl tree, we have used ‘deleteavlNode’ function in which we are prompting a message to the user that which node you want to delete from AVL. The user will pass the key and that node will be deleted.

In main function, we have prompted a message to enter the bit size of machine and enter the number of machines, after that, we have given option to the user whether he/she wants to give the machine ID manually or by hashing function. Whether the user enters select manually or by hashing, a node will be created in circular linked list 2ith the machine ID entered by user. After that, we have printed the routing table as required.

**File creation**

A file is created on the system when the node is appended and the data is written inside it when we user enters data in the file. We have created four variables namely s1, s2, s3, s4. In s1, we have stored the type casted value of machine ID where we have used a built-in function of c++ for typecasting.Ater storing different parameters like extension of file and name of file, we are concatenating the strings and storing it into s4.

**Relationship between classes**

In ‘doublyList‘class, we have created a pointer of ‘doublynode’ class because the node of doubly linked list is in ‘doublynode’ class in which all the information about the node is present. In ‘avl\_tree’ class, we have created a pointer of ‘avl’ class in which we have our node with its full information.

In ‘circularNode’ class, we have created the object of ‘avl\_tree’ class and ‘doublylist’ class because our machines will be created on the specific nodes of circular linked list in which we will be having avl tree and a doubly linked list.