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UID:- Na

Batch:- C4

Exp. No. 9

Aim:- Implement the hash concept by hashing the given 'n' keys using the modulo division method and solve the collision using chaining.

Program:-

```
package Java;
class Node {
  int data;
  Node(int data) {
  Node createNode(int data) {
      Node node = new Node(data);
      while(temp.next != null) {
           temp = temp.next;
```

```
temp.next = node;
Node temp = searchNode(data);
    if(temp == head) {
    while(cur != null) {
       if(cur.next == temp) {
    if(temp.next == null) {
       cur.next = temp.next;
       return head;
Node temp = head;
   if(temp.data == data) {
       return temp;
```

```
temp = temp.next;
static void display(Node node) {
   while(node != null) {
       System.out.print( " ----> " + node.data);
       node = node.next;
static Node[] arr = new Node[10];
public static void main(String[] args) {
       insert(i);
       insert(10 + i);
       display(i);
   System.out.println("=========");
   System.out.println("Inserting 21");
   System.out.println("========");
   insert(21);
   display(1);
   System.out.println("========");
   System.out.println("Deleting 21");
   System.out.println("========");
   delete(21);
   display(1);
   System.out.println("========");
   System.out.println("Searching 19");
   System.out.println("========");
   search(19);
```

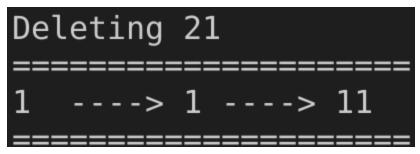
```
static boolean checkCollision(int index) {
   if(arr[index] != null) {
static void insert(int data) {
   int index = data % 10;
   if(checkCollision(index)) {
      arr[index].createNode(data);
       arr[index] = new Node(data);
static void display(int index) {
    System.out.print(index + " ");
   Node.display(arr[index]);
   System.out.println();
static void delete(int data) {
   int index = data % 10;
   Node temp = arr[index].deleteNode(data);
   arr[index] = temp;
static void search(int data) {
    int index = data % 10;
       System.out.println("Data Found");
      System.out.println("Data Not Found");
```

}

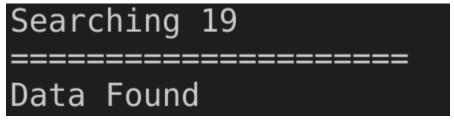
Output:-

```
0 --->
                    10
0
3
                    13
4
   ----> 5 ---->
6
                    17
8
          8
9
Inserting 21
```

I was inserting 21 in the Array. As there is a collision happening I used the linked List to resolve the collision. I used for loop to insert the elements in the array of size 10. Used hash function index = data % 10;



I deleted 21 from the array index 0.



Search for 19 in the array and found it.