**Program – 10**

**AIM – Write a program to implement hashing with a chain.**

**Source Code -**

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#include<conio.h>

struct hash \*hashTable = NULL;

inteleCount = 0;

struct node {

int key;

struct node \*next;

};

struct hash {

struct node \*head;

int count;

};

struct node \* createNode(int key) {

struct node \*newnode;

newnode = (struct node \*)malloc(sizeof(struct node));

newnode->key = key;

newnode->next = NULL;

returnnewnode;

}

voidinsertToHash(int key) {

inthashIndex = key % eleCount;

struct node \*newnode = createNode(key);

if (!hashTable[hashIndex].head) {

hashTable[hashIndex].head = newnode;

hashTable[hashIndex].count = 1;

return;

}

newnode->next = (hashTable[hashIndex].head);

hashTable[hashIndex].head = newnode;

hashTable[hashIndex].count++;

return;

}

voiddeleteFromHash(int key) {

inthashIndex = key % eleCount, flag = 0;

struct node \*temp, \*myNode;

myNode = hashTable[hashIndex].head;

if (!myNode) {

printf("Given data is not present in hash Table!!\n");

return;

}

temp = myNode;

while (myNode != NULL) {

if (myNode->key == key) {

flag = 1;

if (myNode == hashTable[hashIndex].head)

hashTable[hashIndex].head = myNode->next;

else

temp->next = myNode->next;

hashTable[hashIndex].count--;

free(myNode);

break;

}

temp = myNode;

myNode = myNode->next;

}

if (flag)

printf("Data deleted successfully from Hash Table\n");

else

printf("Given data is not present in hash Table!!!!\n");

return;

}

voidsearchInHash(int key) {

inthashIndex = key % eleCount, flag = 0;

struct node \*myNode;

myNode = hashTable[hashIndex].head;

if (!myNode) {

printf("Search element unavailable in hash table\n");

return;

}

while (myNode != NULL) {

if (myNode->key == key) {

printf("KEY FOUND : %d\n", myNode->key);

flag = 1;

break;

}

myNode = myNode->next;

}

if (!flag)

printf("Search element unavailable in hash table\n");

return;

}

void display() {

struct node \*myNode;

inti;

for (i = 0; i<eleCount; i++) {

if (hashTable[i].count == 0)

continue;

myNode = hashTable[i].head;

if (!myNode)

continue;

printf("\nData at index %d in Hash Table:\n", i);

printf("KEY\n");

printf("---\n");

while (myNode != NULL) {

printf("%-12d", myNode->key);

myNode = myNode->next;

}

}

return;

}

void main() {

clrscr();

intn,key,ch;

printf("Enter the number of elements:");

scanf("%d", &n);

eleCount = n;

/\* create hash table with "n" no of buckets \*/

hashTable = (struct hash \*)calloc(n, sizeof (struct hash));

while (1) {

printf("\n1. Insertion\t2. Deletion\n");

printf("3. Searching\t4. Display\n5. Exit\n");

printf("Enter your choice:");

scanf("%d", &ch);

switch (ch) {

case 1:

printf("Enter the key value:");

scanf("%d", &key);

getchar();

/\*inserting new node to hash table \*/

insertToHash(key);

break;

case 2:

printf("Enter the key to perform deletion:");

scanf("%d", &key);

/\* delete node with "key" from hash table \*/

deleteFromHash(key);

break;

case 3:

printf("Enter the key to search:");

scanf("%d", &key);

searchInHash(key);

break;

case 4:

display();

break;

case 5:

exit(0);

default:

printf("U have entered wrong option!!\n");

break;

}

}

getch();

}