**Experiment No.2**

#include<iostream>

#include<string.h>

using namespace std;

class HashFunction

{

typedef struct hash

{

long key;

char name[10];

}hash;

hash h[10];

public:

HashFunction();

void insert();

void display();

int find (long);

void Delete(long);

};

HashFunction::HashFunction()

{

int i;

for(i=0;i<10;i++)

{

h[i].key=-1;

strcpy(h[i].name,"NULL");

}

}

void HashFunction::Delete(long k)

{

int index=find(k);

if(index==-1)

{

cout<<"\n\tkey not found";

}

else

{

h[index].key=-1;

strcpy(h[index].name,"NULL");

cout<<"\n\tkey is deleted";

}

}

int HashFunction::find(long k)

{

int i;

for(i=0;i<10;i++)

{

if(h[i].key==k)

{

cout<<"\n\t"<<h[i].key<<"is found at"<<i<<"location with name"<<h[i].name;

return i;

}

}

if(i==10)

{

return-1;

}

}

void HashFunction::display()

{

int i;

cout<<"\n\t\tKey\t\tName";

for(i=0;i<10;i++)

{

cout<<"\n\th["<<i<<"]\t"<<h[i].key<<"\t\t"<<h[i].name;

}

}

void HashFunction::insert()

{

char ans,n[10],ntemp[10];

long k,temp;

int v,hi,cnt=0,flag=0,i;

do

{

if(cnt>=10)

{

cout<<"\n\tHash Table is FULL";

break;

}

cout<<"\n\tEnter a Telephone no:";

cin>>k;

cout<<"\n\tEnter a client name:";

cin>>n;

hi=k%10;

if(h[hi].key==-1)

{

h[hi].key=k;

strcpy(h[hi].name,n);

}

else

{

if(h[hi].key%10!=hi)

{

temp=h[hi].key;

strcpy(ntemp,h[hi].name);

h[hi].key=k;

strcpy(h[hi].name,n);

for(i=hi+1;i<10;i++)

{

if(h[i].key==-1)

{

h[i].key=temp;

strcpy(h[i].name,ntemp);

flag=1;

break;

}

}

for(i=0;i<hi && flag==0;i++)

{

if(h[i].key==-1)

{

h[i].key=temp;

strcpy(h[i].name,ntemp);

break;

}

}

}

else

{

for(i=hi+1;i<10;i++)

{

if(h[i].key==-1)

{

h[i].key=k;

strcpy(h[i].name,n);

flag=1;

break;

}

}

for(i=0;i<hi && flag==0;i++)

{

if(h[i].key==-1)

{

h[i].key=k;

strcpy(h[i].name,n);

break;

}

}

}

}

flag=0;

cnt++;

cout<<"\n\t..... Do You Want to Insert More Key: y/n";

cin>>ans;

}while(ans=='y'||ans=='Y');

}

int main()

{

long k;

int ch,index;

char ans;

HashFunction obj;

do

{

cout<<"\n\t\*\*\*\*\* Telephone (ADT) \*\*\*\*\*";

cout<<"\n\t1. Insert\n\t2. Display\n\t3. Find\n\t4. Delete\n\t5. Exit";

cout<<"\n\t..... Enter Your Choice: ";

cin>>ch;

switch(ch)

{

case 1:

obj.insert();

break;

case 2:

obj.display();

break;

case 3:

cout<<"\n\tEnter a Key Which You Want to Search: ";

cin>>k;

index=obj.find(k);

if(index==-1)

{

cout<<"\n\tKey Not Found";

}

break;

case 4:

cout<<"\n\tEnter a Key Which You Want to Delete: ";

cin>>k;

obj.Delete(k);

break;

case 5:

break;

}

cout<<"\n\t..... Do You Want to Continue in Main Menu:y/n ";

cin>>ans;

}while(ans=='y'||ans=='Y');

}

**Output:**

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 1

Enter a Telephone no:123

Enter a client name:vedant

..... Do You Want to Insert More Key: y/ny

Enter a Telephone no:233

Enter a client name:om

..... Do You Want to Insert More Key: y/ny

Enter a Telephone no:765

Enter a client name:sham

..... Do You Want to Insert More Key: y/ny

Enter a Telephone no:455

Enter a client name:arpan

..... Do You Want to Insert More Key: y/ny

Enter a Telephone no:666

Enter a client name:ram

..... Do You Want to Insert More Key: y/nn

..... Do You Want to Continue in Main Menu:y/n y

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 2

Key Name

h[0] -1 NULL

h[1] -1 NULL

h[2] -1 NULL

h[3] 123 vedant

h[4] 233 om

h[5] 765 sham

h[6] 666 ram

h[7] 455 arpan

h[8] -1 NULL

h[9] -1 NULL

..... Do You Want to Continue in Main Menu:y/n y

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 3

Enter a Key Which You Want to Search: 666

666is found at6location with nameram

..... Do You Want to Continue in Main Menu:y/n y

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 4

Enter a Key Which You Want to Delete: 666

666is found at6location with nameram

key is deleted

..... Do You Want to Continue in Main Menu:y/n y

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 2

Key Name

h[0] -1 NULL

h[1] -1 NULL

h[2] -1 NULL

h[3] 123 vedant

h[4] 233 om

h[5] 765 sham

h[6] -1 NULL

h[7] 455 arpan

h[8] -1 NULL

h[9] -1 NULL

..... Do You Want to Continue in Main Menu:y/n y

\*\*\*\*\* Telephone (ADT) \*\*\*\*\*

1. Insert

2. Display

3. Find

4. Delete

5. Exit

..... Enter Your Choice: 5

..... Do You Want to Continue in Main Menu:y/n n

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Process exited after 110 seconds with return value 0

Press any key to continue . . .