**Assignment number: 8**

**Subject: ADVANCED DATA STRUCTURES LAB**

Name: ***RIA MITTAL***

Class: ***SECOND YEAR ENGINEERING***

Division: ***B***

Roll no: ***222008***

Batch: ***B1***

**PROBLEM STATEMENT:**

Implement all the functions of a dictionary (ADT) using hashing.

Data: Set of (key, value) pairs, Keys are mapped to values, Keys must be comparable, Keys must be unique

Standard Operations: Insert(key, value), Find(key), Delete(key)

**Code:**

#include<iostream>

using namespace std;

int n;

class data

{

public:

long long int arr;

char name[100];

};

class hashing

{

int v[10];

int chain[10];

string hash[10];

long long int tel[10];

public:

data d[10];

int accept(int);

int display(int);

int hashed();

int display\_hash();

int search();

int ascii(char \*);

};

int hashing::accept(int i)

{

cout<<"\nenter the name of client : ";

ws(cin);

cin.getline(d[i].name,100);

cout<<"\nenter the adhaar number : ";

cin>>d[i].arr;

}

int hashing::display(int i)

{

cout<<d[i].name<<"\t"<<d[i].arr<<endl;

}

int hashing::ascii(char \*p)

{

int sum=0;

for(int i=0;p[i]!='\0';i++)

{

int val=int(p[i]);

sum=sum+val;

}

return sum;

}

int hashing::hashed()

{

int x;

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

{

v[i]=0;

hash[i]="";

chain[i]=-1;

}

int i=0,j=0;

//chaining without replacement

while(j<n)

{

int mod=ascii(d[j].name)%10;

if(v[mod]!=1)

{

hash[mod]=d[j].name;

tel[mod]=d[j].arr;

v[mod]=1;

x=mod;

}

else

{

while(v[mod]!=0 )

{

if(mod==9)

{

mod=0;

}

else

mod++;

}

hash[mod]=d[j].name;

tel[mod]=d[j].arr;

v[mod]=1;

chain[x]=mod;

}

j++;

}

}

int hashing::display\_hash()

{

cout<<"\nthe hashed function is\n";

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

{

if(hash[i]=="")

cout<<i<<"\t----"<<"\t"<<chain[i]<<"\t----\t"<<endl;

else

cout<<i<<"\t"<<hash[i]<<"\t"<<chain[i]<<"\t"<<tel[i]<<endl;

}

}

int hashing::search()

{

char nm[100];

int count=0;

cout<<"\nenter the name of the person to be searched : ";

ws(cin);

cin.getline(nm,100);

int val=ascii(nm)%10;

cout<<endl<<val<<endl;

int index;

if(hash[val]==nm)

{

index=val;

count=1;

}

else

{

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

{

if(hash[i]==nm)

{

index=i;

count=1;

}

else

continue;

}

}

if(count==1)

cout<<"\n------FOUND DETAILS------\n"<<hash[index]<<"\t"<<tel[index];

else

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

}

int main()

{

hashing obj;

char ch,c;

int ans;

cout<<"\nenter the number of records : ";

cin>>n;

if(n>10)

cout<<"\nyou can enter maximum 10 client details\n";

else

{

do

{

cout<<"\n1.)ACCEPT\n2.)DISPLAY DETAILS\n3.)DISPLAY HASH TABLE\n4.)SEARCH FOR ADHAAR NUMBER\n5.)EXIT\n";

cin>>ans;

switch(ans)

{

case 1:{

for(int i=0;i<n;i++)

obj.accept(i);

break;

}

case 2:{

for(int i=0;i<n;i++)

obj.display(i);

break;

}

case 3:{

obj.hashed();

obj.display\_hash();

break;

}

case 4:{

obj.search();

break;

}

case 5:continue;

default: cout<<"\ninvalid entry...try again\n";

}

cout<<"\ndo you want to continue?(y/n)\n";

cin>>c;

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

}

}

**OUTPUT:**

enter the number of records : 5

1.)ACCEPT

2.)DISPLAY DETAILS

3.)DISPLAY HASH TABLE

4.)SEARCH FOR ADHAAR NUMBER

5.)EXIT

1

enter the name of client : ria

enter the adhaar number : 12345678999

enter the name of client : air

enter the adhaar number : 1234567899

enter the name of client : riya

enter the adhaar number : 26874683243

enter the name of client : neev

enter the adhaar number : 66421315646

enter the name of client : even

enter the adhaar number : 63757251555

do you want to continue?(y/n)

y

1.)ACCEPT

2.)DISPLAY DETAILS

3.)DISPLAY HASH TABLE

4.)SEARCH FOR ADHAAR NUMBER

5.)EXIT

2

ria 12345678999

air 1234567899

riya 26874683243

neev 66421315646

even 63757251555

do you want to continue?(y/n)

y

1.)ACCEPT

2.)DISPLAY DETAILS

3.)DISPLAY HASH TABLE

4.)SEARCH FOR ADHAAR NUMBER

5.)EXIT

3

the hashed function is

0 neev 1 66421315646

1 even -1 63757251555

2 ---- -1 ----

3 ---- -1 ----

4 ---- -1 ----

5 ---- -1 ----

6 ria 7 12345678999

7 air -1 1234567899

8 riya -1 26874683243

9 ---- -1 ----

do you want to continue?(y/n)

y

1.)ACCEPT

2.)DISPLAY DETAILS

3.)DISPLAY HASH TABLE

4.)SEARCH FOR ADHAAR NUMBER

5.)EXIT

4

enter the name of the person to be searched : air

6

------FOUND DETAILS------

air 1234567899

do you want to continue?(y/n)

y

1.)ACCEPT

2.)DISPLAY DETAILS

3.)DISPLAY HASH TABLE

4.)SEARCH FOR ADHAAR NUMBER

5.)EXIT

5