#include <iostream>

#include<math.h>

using namespace std;

#define TABLE\_SIZE 10

class QuadraticProbing

{

int HTable[TABLE\_SIZE];

public:

QuadraticProbing()

{

int i;

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

HTable[i]=NULL;

}

void Insert();

void Search();

void Display();

void Delete();

};

void QuadraticProbing :: Insert()

{

int value, index, i, flag=0, hkey;

cout << "\nEnter the value to insert into the hash table " << endl;

cin >> value;

hkey = value % TABLE\_SIZE;

if(HTable[hkey] == NULL)

HTable[hkey] = value;

else

{

for(i=1;i <= TABLE\_SIZE;i++)

{

index = (hkey + i\*i )% TABLE\_SIZE;

if(HTable[index] == NULL)

{

HTable[index] = value;

break;

}

}

if(i > TABLE\_SIZE)

cout << "\nElement cannot be inserted, Table Full." << endl;

}

}

void QuadraticProbing :: Search()

{

int value, index, i, flag = 0, hkey;

cout << "\nEnter search element : " << endl;

cin >> value;

hkey = value % TABLE\_SIZE;

if (HTable[hkey] == value)

cout << value << " is found at index " << hkey << endl;

else

{

for(i=1; i <= TABLE\_SIZE; i++)

{

index = (hkey + i\*i) % TABLE\_SIZE;

if(HTable[index] == value)

{

cout << value << " is found at index " << index << endl;

break;

}

}

if(i > TABLE\_SIZE)

cout << "Sorry, " << value << " is not found in the Hash Table" << endl;

}

}

void QuadraticProbing :: Delete()

{

int value, index, i, flag = 0, hkey;

cout << "\nEnter value to delete from Hash Table : " << endl;

cin >> value;

hkey = value % TABLE\_SIZE;

if (HTable[hkey] == value)

{

HTable[hkey] = NULL;

cout << value << " deleted from the Hash Table" << endl;

}

else

{

for(i=1; i <= TABLE\_SIZE ; i++)

{

index = (hkey + i\*i) % TABLE\_SIZE;

if(HTable[index] == value)

{

HTable[index] = NULL;

cout << value << " deleted from the Hash Table" << endl;

break;

}

}

if(i > TABLE\_SIZE)

cout << "Sorry Deletion not possible. " << value << " is not found in the Hash Table" << endl;

}

}

void QuadraticProbing :: Display()

{

int i;

cout << "\n HASH TABLE" << endl;

cout << "Index\t\tValue" << endl;

for(i=0;i< TABLE\_SIZE; i++)

cout << i << "\t\t" << HTable[i] << endl;

}

int main()

{

QuadraticProbing QP;

int choice;

while(1)

{

cout << "\nQUADRATIC PROBING MENU\n1.Insert\n2.Display\n3.Search\n4.Delete\n5.Exit" << endl;

cout << "What's your choice : ";

cin >> choice;

switch(choice)

{

case 1:

QP.Insert();

break;

case 2:

QP.Display();

break;

case 3:

QP.Search();

break;

case 4:

QP.Delete();

break;

case 5:

cout << "\nHappy Learning..!! Bye Bye...\n\n";

exit(0);

default: cout << "\n Sorry, You have entered wrong choice..!! " << endl << "\nTry again..!! or Exit";

}

}

return 0;

}