**#include<iostream>**

**#include<string>**

**using namespace std;**

**class HashFunction {**

**struct Hash {**

**long key;**

**string name;**

**};**

**Hash h[10];**

**public:**

**HashFunction() {**

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

**h[i].key = -1;**

**h[i].name = "NULL";**

**}**

**}**

**void insert();**

**void display();**

**int find(long);**

**void Delete(long);**

**};**

**void HashFunction::Delete(long k) {**

**int index = find(k);**

**if (index != -1) {**

**h[index].key = -1;**

**h[index].name = "NULL";**

**cout << "\n\tKey is Deleted";**

**} else {**

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

**}**

**}**

**int HashFunction::find(long k) {**

**for (int 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;**

**}**

**}**

**return -1;**

**}**

**void HashFunction::display() {**

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

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

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

**}**

**}**

**void HashFunction::insert() {**

**char ans;**

**long k;**

**string n;**

**int cnt = 0;**

**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;**

**int hi = k % 10;**

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

**h[hi].key = k;**

**h[hi].name = n;**

**} else {**

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

**long temp = h[hi].key;**

**string ntemp = h[hi].name;**

**h[hi].key = k;**

**h[hi].name = n;**

**int flag = 0;**

**for (int i = hi + 1; i < 10; i++) {**

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

**h[i].key = temp;**

**h[i].name = ntemp;**

**flag = 1;**

**break;**

**}**

**}**

**if (!flag) {**

**for (int i = 0; i < hi; i++) {**

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

**h[i].key = temp;**

**h[i].name = ntemp;**

**break;**

**}**

**}**

**}**

**} else {**

**int flag = 0;**

**for (int i = hi + 1; i < 10; i++) {**

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

**h[i].key = k;**

**h[i].name = n;**

**flag = 1;**

**break;**

**}**

**}**

**if (!flag) {**

**for (int i = 0; i < hi; i++) {**

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

**h[i].key = k;**

**h[i].name = n;**

**break;**

**}**

**}**

**}**

**}**

**}**

**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:**

**cout << "\*\*\*\*\*\*\* INPUT YOUR VALUES \*\*\*\*\*\*\*";**

**obj.insert();**

**break;**

**case 2:**

**cout << "\*\*\*\*\*\*\* DISPLAY THE CONTENTS \*\*\*\*\*\*\*";**

**obj.display();**

**break;**

**case 3:**

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

**cin >> k;**

**index = obj.find(k);**

**break;**

**case 4:**

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

**cin >> k;**

**obj.Delete(k);**

**break;**

**}**

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

**cin >> ans;**

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

**return 0;**

**}**