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#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#include <stdbool.h>

#define SIZE 20

struct DataItem
{
    int data;

    int key;
};

struct DataItem* hashArray[SIZE];

struct DataItem* dummyItem;

struct DataItem* item;

int hashCode(int key) {
    return key % SIZE;
}

struct DataItem *search(int key) {
    int hashIndex = hashCode(key);
    while(hashArray[hashIndex] != NULL) {
        if(hashArray[hashIndex]->key == key)
            return hashArray[hashIndex];
        ++hashIndex;
        hashIndex %= SIZE;
    }
    return NULL;
}

void insert(int key,int data) {
    struct DataItem *item = (struct DataItem*) malloc(sizeof(struct DataItem));

    item->data = data;

    item->key = key;

    int hashIndex = hashCode(key);

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while(hashArray[hashIndex] != NULL && hashArray[hashIndex]->key != -
1) {
++hashIndex;
hashIndex %= SIZE;
}
hashArray[hashIndex] = item;
}

struct DataItem* delete(struct DataItem* item)
{
int key = item->key;
int hashIndex = hashCode(key);
while(hashArray[hashIndex] != NULL) {
if(hashArray[hashIndex]->key == key) {
struct DataItem* temp = hashArray[hashIndex];
hashArray[hashIndex] = dummyItem;
return temp;
}
++hashIndex;
hashIndex %= SIZE;
}
return NULL;
}

void display() {
int i = 0;
for(i = 0; i<SIZE; i++) {
if(hashArray[i] != NULL)
printf(" (%d,%d)",hashArray[i]->key,hashArray[i]->data);
else
printf(" ~~ ");
}
printf("\n");
}

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}

int main() {
    dummyItem = (struct DataItem*) malloc(sizeof(struct DataItem));
    dummyItem->data = -1;
    dummyItem->key = -1;
    insert(1, 20);
    insert(2, 70);
    insert(42, 80);
    insert(4, 25);
    insert(12, 44);
    insert(14, 32);
    insert(17, 11);
    insert(13, 78);
    insert(37, 97);
    display();
    item = search(37);
    if(item != NULL) {
        printf("Element found: %d\n", item->data);
    } else {
        printf("Element not found\n");
    }
    delete(item);
    item = search(37);
    if(item != NULL) {
        printf("Element found: %d\n", item->data);
    } else {
        printf("Element not found\n");
    }
}

```

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~~ (1,20) (2,70) (42,80) (4,25) ~~ ~~ ~~ ~~ ~~ ~~ (12,44) (13,78) (14,32) ~~ ~~ (17,11) (37,97) ~~  
Element found: 97  
Element not found
```

```
-----  
Process exited after 0.03058 seconds with return value 0  
Press any key to continue . . .
```