Laboratory

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HASHING

Hashing is used to index and retrieve items in a database

Objective

Hash table is one of the important data structures, which plays a significant role in information retrieval. As an example, suppose a set of N distinct records with keys K1,K2,---Kn are stored in a file and if we want to find a record with a given key value k,the simplest way is to perform sequential search.

In this sequential searching the time required is directly proportional to the number of records in the file. If the number of records increases searching time also increases so in order to reduce searching time we use different hash functions.

Overview

Division method

The Division-remainder is the simplest and most commonly used method.
In this method,the key K is divided by the number of slots N in the hash table,and the remainder obtained after division is used as an index in the hash table.
The hash function is **h(k)=K mod N** where K=key value and N=table size

Procedure

AIM: Write a program to demonstrate the hash-division method.

CODE:

```
#include<stdio.h>
#include<stdlib.h>
void main()
{
	int  a[20],i,x,n,count=0,hv;
	int  ch,choice;
	printf("enter the size of the hash table:");
	scanf("%d",&n);
	for(i=0;i<20;i++)
	a[i]=0;
```

```
do
{
        printf("1.insertion\n2.deletion\n3.search\n4.Exit\n");
        printf("enter ur choice:");
        scanf("%d",&choice);
        switch(choice)
        {
                case 1:printf("enter the element to be inserted:");
                        scanf("%d",&x);
                        hv=x%n;
                        if(a[hv]==0)
                        {
                                a[hv]=x;
                                printf("the element is inserted at position %d \n",hv);
                                count++;
                         }
 else
printf("element can't be inserted as cell is not empty!!\n");
if(count==n)
 {
printf("table is full!!");
printf("deletion or search is possible");
}
  break;
case 2:printf(" enter the element to be deleted:");
scanf("%d",&x);
hv=x%n;
if(a[hv]==x)
{
a[hv]=0;
printf("The element is deleted \n");
    }
 else
        printf("the element is not found!!\n");
 break;
case 3:printf(" enter the element to be searched:");
scanf("%d",&x);
hv=x%n;
if(a[hv]==x)
printf("the element is found at position:%d \n",hv);
 else
printf("the element is not found \n");
 break;
case 4:
default: exit(0);
}
}while(choice<=3&&count<=n);
```

OUTPUT:

```
student@teacher-virtual-machine:~/ads3$ cc 1mul.c
student@teacher-virtual-machine:~/ads3$ ./a.out
enter the size of the hash table:12
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:1
enter the element to be inserted:12
the element is inserted at position 0
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:1
enter the element to be inserted:23
the element is inserted at position 11
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:1
enter the element to be inserted:34
the element is inserted at position 10
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:2
 enter the element to be deleted:23
The element is deleted
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:2
 enter the element to be deleted:22
the element is not found!!
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:3
 enter the element to be searched:23
the element is not found
1.insertion
2.deletion
```

3.search
4.Exit
enter ur choice:3
enter the element to be searched:12
the element is found at position:0
1.insertion
2.deletion
3.search
4.Exit
enter ur choice:4

Viva-Voice Questions

1) What is hashing?
2) What is linear probing and quadratic probing?
3) What are collision resolution techniques?
4) What is rehashing?
5) What is division-remainder method?
6) Define extensible hashing?

Lab Report

After successful completion of this lab experiment, the student will be able to know about hashing &different hashing techniques.

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Teaching Exp: 5 Yrs
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