

SYMBOL TABLE USING HASHING

AIM

Implement a symbol table with suitable hashing.

SOURCE CODE

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#define MAX 11

char l[10];
int arr[MAX];

struct symbol_table
{
    int add;
    char label[10];
}syntab[11];

void search();
int create(int);
void lprob(int [],int,int);
void display(int []);

void main()
{
    int num,key,i,n,ans;
    for(i=0;i<MAX;i++)
        arr[i]=0;
    do
    {
        printf("\n1.create a symbol table \n2.search in the symbol table\n3.Display\n4.Exit\n\nenter your choice : ");
        scanf("%d",&n);
        switch(n)
        {
            case 1 : printf("\nEnter the address : ");
                      scanf("%d",&num);
                      key=create(num);
                      printf("enter The label : ");
                      scanf("%s",l);
                      lprob(arr,key,num);
                      break;
            case 2 : search(); break;
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        case 3 : display(arr); break;
        case 4 : exit(0);
    }
}while(n<=4);
}

int create(int num)
{
    int key;
    key=num%11;
    return key;
}

void lprob(int a[MAX],int key,int num)
{
    int flag,i,count=0;
    flag=0;
    if(a[key]==0)
    {
        a[key]=num;
        symtab[key].add=num;
        strcpy(symtab[key].label,l);
    }
    else
    {
        i=0;
        while(i<MAX)
        {
            if(a[i]!=0)
                count++;
            i++;
        }
        if(count==MAX)
        {
            printf("\nHash table is full");
            display(a);
            exit(1);
        }
        for(i=key+1;i<MAX;i++)
            if(a[i]==0)
            {
                a[i]=num;
                flag=1;
                symtab[key].add=num;
                strcpy(symtab[key].label,l);
                break;
            }
        for(i=0;i<key && flag==0;i++)
            if(a[i]==0)
            {

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        a[i]=num;
        flag=1;
        symtab[key].add=num;
        strcpy(symtab[key].label,l);
        break;
    }
}

void display(int a[MAX])
{
    FILE *f;
    int i;
    f=fopen("symbol.txt","w");
    printf("\nThe Symbol Table is");
    printf("\nhashvalues address label");
    for(i=0;i<MAX;i++)
    {
        printf("\n%d\t %d\t %s",i,symtab[i].add,symtab[i].label);
        fprintf(f,"\n%d %d %s",i,symtab[i].add,symtab[i].label);
    }
    fclose(f);
    printf("\n");
}

void search()
{
    FILE *fp1;
    char la[10];
    int set=0,s;
    int j,i;
    printf("enter the label : ");
    scanf("%s",la);
    fp1=fopen("symbol.txt","r");
    for(i=0;i<MAX;i++)
    {
        fscanf(fp1,"%d%d",&j,&symtab[i].add);
        if(symtab[i].add!=0)
            fscanf(fp1,"%s",symtab[i].label);
    }
    for(i=0;i<MAX;i++)
    {
        if(symtab[i].add!=0)
        {
            if(strcmp(symtab[i].label,la)==0)
            {
                set=1;
                s=symtab[i].add;
            }
        }
    }
}

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    }
    if(set==1)
        printf("\nThe label ---%s--- is present in the symbol table at address : %d\n",la,s);
    else
        printf("\nThe label is not present in the symbol table\n");
}

```

OUTPUT

```

anjana-anjali@anjana-anjali:~/Documents/program/ss_lab/pgm$ gcc symtab.c
anjana-anjali@anjana-anjali:~/Documents/program/ss_lab/pgm$ ./a.out

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 1

Enter the address : 1005
enter The label : data0

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 1

Enter the address : 3450
enter The label : data1

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 1

Enter the address : 7895
enter The label : data2

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

```

```

enter your choice : 3

The Symbol Table is
hashvalues address label
0          0
1          0
2          0
3          0
4         1005    data0
5          0
6          0
7         3450    data1
8         7895    data2
9          0
10         0

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 2
enter the label : data2

The label ---data2--- is present in the symbol table at address : 7895

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 2
enter the label : asd

The label is not present in the symbol table

1.create a symbol table
2.search in the symbol table
3.Display
4.Exit

enter your choice : 4
anjana-anjali@anjana-anjali:~/Documents/program/ss_lab/pgm$

```

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