**7. Symbol Table**

#include<stdio.h>

#include<conio.h>

#include<string.h>

#include<stdlib.h>

int size=0;

void Insert();

void Display();

void Delete();

int Search(char lab[]);

void Modify();

struct SymbTab

{

char label[10],symbol[10];

int addr;

struct SymbTab \*next;

};

struct SymbTab \*first,\*last;

void main()

{

int op,y;

char la[10];

do

{

printf("\n\tSYMBOL TABLE IMPLEMENTATION\n");

printf("\n\t1.INSERT\n\t2.DISPLAY\n\t3.DELETE\n\t4.SEARCH\n\t5.MODIFY\n\t6.END\n");

printf("\n\tEnter your option : ");

scanf("%d",&op);

switch(op)

{

case 1:

Insert();

break;

case 2:

Display();

break;

case 3:

Delete();

break;

case 4:

printf("\n\tEnter the label to be searched : ");

scanf("%s",la);

y=Search(la);

printf("\n\tSearch Result:");

if(y==1)

printf("\n\tThe label is present in the symbol table\n");

else

printf("\n\tThe label is not present in the symbol table\n");

break;

case 5:

Modify();

break;

case 6:

exit(0);

}

}while(op<6);

getch();

}

void Insert()

{

int n;

char l[10];

printf("\n\tEnter the label : ");

scanf("%s",l);

n=Search(l);

if(n==1)

printf("\n\tThe label exists already in the symbol table\n\tDuplicate can’t be inserted");

else

{

struct SymbTab \*p;

p=malloc(sizeof(struct SymbTab));

strcpy(p->label,l);

printf("\n\tEnter the symbol : ");

scanf("%s",p->symbol);

printf("\n\tEnter the address : ");

scanf("%d",&p->addr);

p->next=NULL;

if(size==0)

{

first=p;

last=p;

}

else

{

last->next=p;

last=p;

}

size++;

}

printf("\n\tLabel inserted\n");

}

void Display()

{

int i;

struct SymbTab \*p;

p=first;

printf("\n\tLABEL\t\tSYMBOL\t\tADDRESS\n");

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

{

printf("\t%s\t\t%s\t\t%d\n",p->label,p->symbol,p->addr);

p=p->next;

}

}

int Search(char lab[])

{

int i,flag=0;

struct SymbTab \*p;

p=first;

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

{

if(strcmp(p->label,lab)==0)

flag=1;

p=p->next;

}

return flag;

}

void Modify()

{

char l[10],nl[10];

int add,choice,i,s;

struct SymbTab \*p;

p=first;

printf("\n\tWhat do you want to modify?\n");

printf("\n\t1.Only the label\n\t2.Only the address\n\t3.Both the label and address\n");

printf("\tEnter your choice : ");

scanf("%d",&choice);

switch(choice)

{

case 1:

printf("\n\tEnter the old label : ");

scanf("%s",l);

s=Search(l);

if(s==0)

printf("\n\tLabel not found\n");

else

{

printf("\n\tEnter the new label : ");

scanf("%s",nl);

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

{

if(strcmp(p->label,l)==0)

strcpy(p->label,nl);

p=p->next;

}

printf("\n\tAfter Modification:\n");

Display();

}

break;

case 2:

printf("\n\tEnter the label where the address is to be modified : ");

scanf("%s",l);

s=Search(l);

if(s==0)

printf("\n\tLabel not found\n");

else

{

printf("\n\tEnter the new address : ");

scanf("%d",&add);

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

{

if(strcmp(p->label,l)==0)

p->addr=add;

p=p->next;

}

printf("\n\tAfter Modification:\n");

Display();

}

break;

case 3:

printf("\n\tEnter the old label : ");

scanf("%s",l);

s=Search(l);

if(s==0)

printf("\n\tLabel not found\n");

else

{

printf("\n\tEnter the new label : ");

scanf("%s",nl);

printf("\n\tEnter the new address : ");

scanf("%d",&add);

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

{

if(strcmp(p->label,l)==0)

{

strcpy(p->label,nl);

p->addr=add;

}

p=p->next;

}

printf("\n\tAfter Modification:\n");

Display();

}

break;

}

}

void Delete()

{

int a;

char l[10];

struct SymbTab \*p,\*q;

p=first;

printf("\n\tEnter the label to be deleted : ");

scanf("%s",l);

a=Search(l);

if(a==0)

printf("\n\tLabel not found\n");

else

{

if(strcmp(first->label,l)==0)

first=first->next;

else if(strcmp(last->label,l)==0)

{

q=p->next;

while(strcmp(q->label,l)!=0)

{

p=p->next;

q=q->next;

}

p->next=NULL;

last=p;

}

else

{

q=p->next;

while(strcmp(q->label,l)!=0)

{

p=p->next;

q=q->next;

}

p->next=q->next;

}

size--;

printf("\n\tAfter Deletion:\n");

Display();

}

}

**OUTPUT:**

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 1

Enter the label : str

Enter the symbol : string

Enter the address : 1234

Label inserted

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 1

Enter the label : i

Enter the symbol : int

Enter the address : 4567

Label inserted

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 2

LABEL SYMBOL ADDRESS

str string 1234

i int 4567

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 4

Enter the label to be searched : i

Search Result:

The label is present in the symbol table

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 5

What do you want to modify?

1.Only the label

2.Only the address

3.Both the label and address

Enter your choice : 1

Enter the old label : i

Enter the new label : i1

After Modification:

LABEL SYMBOL ADDRESS

str string 1234

i1 int 4567

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 3

Enter the label to be deleted : i1

After Deletion:

LABEL SYMBOL ADDRESS

str string 1234

SYMBOL TABLE IMPLEMENTATION

1.INSERT

2.DISPLAY

3.DELETE

4.SEARCH

5.MODIFY

6.END

Enter your option : 6

Process returned 0 (0x0) execution time : 61.312 s

Press any key to continue.