**Experiment No. 3**

**Aim: Implementation of 2 pass assembler**

**Code:**

**Pass1 Assembler**

#include<stdio.h>

#include<conio.h>

#include<string.h>

void main() {

FILE \*f1,\*f2,\*f3,\*f4;

int lc,sa,l,op1,o,len;

char m1[20],la[20],op[20],otp[20],ch;

clrscr();

f1=fopen("input.txt","r");

f3=fopen("symtab.txt","w");

fscanf(f1,"%s %s %d",la,m1,&op1);

if((strcmp(m1,"START")==0)||(strcmp(m1,"USING")==0)) {

sa=op1;

lc=sa;

printf("\t%s\t%s\t%d\n",la,m1,op1); }

else

lc=0;

fscanf(f1,"%s %s",la,m1);

while(!feof(f1)) {

fscanf(f1,"%s",op);

printf("\n%d\t%s\t%s\t%s\n",lc,la,m1,op);

if(strcmp(la,"-")!=0)

fprintf(f3,"\n%d\t%s\n",lc,la);

f2=fopen("optab.txt","r");

fscanf(f2,"%s %d",otp,&o);

while(!feof(f2)) {

if(strcmp(m1,otp)==0) {

lc=lc+4;

break; }

fscanf(f2,"%s %d",otp,&o); }

fclose(f2);

if(strcmp(m1,"ST")==0)

lc=lc+4;

if(strcmp(m1,"DC")==0)

lc=lc+4;

else if(strcmp(m1,"DS")==0)

lc=lc+4;

fscanf(f1,"%s%s",la,m1); }

if(strcmp(m1,"END")==0)

printf("Program length =\n%d",lc-sa);

fclose(f1);

fclose(f3);

getch();

}

**Input.txt**

PRG1 START 0

- USING \*,15

- L 1,FIVE

- A 1,FOUR

- ST 1,TEMP

FOUR DC F'4'

FIVE DC F'5'

TEMP DS '1'F

- END –

**Optab.txt**

L 58

A 5A

ST 50

**Symtab.txt**

12 FOUR

16 FIVE

20 TEMP

**Output:**

PRG1 START 0

0 - USING \*,15

0 - L 1,FIVE

4 - A 1,FOUR

8 - ST 1,TEMP

12 FOUR DC F'4'

16 FIVE DC F'5'

20 TEMP DS '1'F

24 - END -

Program length = 24

**Pass 2 Assembler**

#include<stdio.h>

#include<conio.h>

#include<string.h>

#include<ctype.h>

void main() {

FILE \*fint,\*ftab,\*flen,\*fsym;

int op1[10],txtlen,txtlen1,i,j=0,len;

char add[5],symadd[5],op[5],start[10],temp[30],line[20],label[20],mne[10];

char operand[10],symtab[10],opmne[10],ch;

clrscr();

fint=fopen("input2.txt","r");

flen=fopen("length.txt","r");

ftab=fopen("optab.txt","r");

fsym=fopen("symtab.txt","r");

fscanf(fint,"%s%s%s%s",add,label,mne,operand);

if(strcmp(mne,"START")==0) {

strcpy(start,operand);

fscanf(flen,"%d",&len); }

printf("\nThe contents of intermediate file:\n");

while((ch=fgetc(fint))!=EOF)

printf("%c",ch);

fclose(fint);

printf("\nThe contents of symbol table:\n");

while((ch=fgetc(fsym))!=EOF)

printf("%c",ch);

fclose(fsym);

fint=fopen("input2.txt","r");

fsym=fopen("symtab.txt","r");

printf("\nThe contents of object file:\n");

printf("H^%s^%s^%d\nT^00%s^",label,start,len,start);

fscanf(fint,"%s%s%s%s",add,label,mne,operand);

while(strcmp(mne,"END")!=0) {

fscanf(ftab,"%s%s",opmne,op);

while(!feof(ftab)) {

if(strcmp(mne,opmne)==0) {

fclose(ftab);

fscanf(fsym,"%s%s",symadd,symtab);

while(!feof(fsym)) {

if(strcmp(operand,symtab)==0) {

printf("%s%s",op,symadd);

break; }

else

fscanf(fsym,"%s%s",symadd,symtab); }

break; }

else

fscanf(ftab,"%s%s",opmne,op); }

if((strcmp(mne,"DC")==0)||(strcmp(mne,"DS")==0)) {

len=strlen(operand);

for(i=2;i<len;i++)

printf("%d",operand[i]);

printf("^"); }

fscanf(fint,"%s%s%s%s",add,label,mne,operand);

ftab=fopen("optab.txt","r");

fseek(ftab,SEEK\_SET,0); }

printf("\nE^00%s",start);

fclose(fint);

fclose(ftab);

fclose(fsym);

fclose(flen);

getch(); }

**Intermediate code**

- PRG1 START 0

0 - USING \*,15

0 - L 1,FIVE

4 - A 1,FOUR

8 - ST 1,TEMP

12 FOUR DC F'4'

16 FIVE DC F'5'

20 TEMP DS '1'F

24 - END –

**Output**

The contents of intermediate file:

0 - USING \*,15

0 - L 1,FIVE

4 - A 1,FOUR

8 - ST 1,TEMP

12 FOUR DC F'4'

16 FIVE DC F'5'

20 TEMP DS '1'F

24 - END -

The contents of symbol table:

12 FOUR

16 FIVE

20 TEMP

The contents of object file:

H^PRG1^0^24

T^000^5239^5339^3970^

E^000