## **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
        1c=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);
```

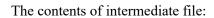
```
while(!feof(f2)) {
       if(strcmp(m1,otp)==0) {
               lc=lc+4;
               break; }
       fscanf(f2,"%s %d",otp,&o); }
       fclose(f2);
       if(strcmp(m1,"ST")==0)
       1c=1c+4;
       if(strcmp(m1,"DC")==0)
         1c=1c+4;
       else if(strcmp(m1,"DS")==0)
               1c=1c+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
         USING *,15
0
0
         L
              1,FIVE
4
         A
               1,FOUR
         ST
8
               1,TEMP
12
     FOUR DC
                    F'4'
     FIVE DC
                   F'5'
16
20
     TEMP DS
                   '1'F
          END
24
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



- 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