```
#include<stdlib.h>
#include<stdio.h>
#define MAX 20
#include<string.h>

struct symbol
{
      char sym[10];
      int addr;
}S[MAX];

struct litab
{
      char lit[10];
      int addr;
}L[MAX];

void print_file(char *);
void print_symtab();
void print_littab();

char
optab[][6]={"STOP","ADD","SUB","MULT","MOVER","MOVEM","COMP","BC","DIV
","READ","PRINT"};
char regtab[][5]={"AREG","BREG","CREG","DREG"};
char adtab[][7]={"START","END","ORIGIN","EQU","LTORG"};
char condtab[][4]={"LT","LE","EQ","GT","GE","ANY"};

FILE *fs,*ft;
char
buffer[80],source[80],tok1[10],tok2[10],tok3[10],tok4[10],tok5[10],b[5
];
int lc=0,sc=0,poolcnt=0,litcnt=0;
int pooltab[10];


int search_optab(char *s)
{
      int i;
      for(i=0;i<11;i++)
      {
            if(strcmp(optab[i],s)==0)
            {
                  return i;
            }
      }
      return -1;
}


int search_regtab(char *s)
{
```

```
	int i;
	for(i=0;i<4;i++)
	{
		if(strcmp(regtab[i],s)==0)
		{
			return i+1;
		}
	}
	return -1;
}


int search_condtab(char *s)
{
	int i;
	for(i=0;i<6;i++)
	{
		if(strcmp(condtab[i],s)==0)
		{
			return (i+1);
		}
	}
	return -1;
}


int search_adtab(char *s)
{
	int i;
	for(i=0;i<5;i++)
	{
		if(strcmp(adtab[i],s)==0)
		{
			return i+1;
		}
	}
	return -1;
}


int search_symtab(char *s)
{
	int i;
	for(i=0;i<sc;i++)
	{
		if(strcmp(S[i].sym,s)==0)
		{
			return i;
		}
	}
	return -1;
}
```

```
int search_littab(char *s)
{
      int i;
      for(i=pooltab[poolcnt];i<litcnt;i++)
      {
            if(strcmp(L[i].lit,s)==0)
            {
                  return i;
            }
      }
      return -1;
}

void pass1()
{
      int p;
      int n,i=0,j=0,k=0,z,x=0;

      fs=fopen(source,"r");
      if(fs==NULL)
      {
            printf("\n file does not exist!!!!");

            exit(0);
      }

      ft=fopen("id.txt","w");
      while(fgets(buffer,80,fs))
      {
            n=sscanf(buffer,"%s%s%s%s%s",tok1,tok2,tok3,tok4,tok5);
            switch(n)
            {
               case 1: //ltorg,end
                  i=search_adtab(tok1);
                  if(i==2)
                  {
                     for(j=pooltab[poolcnt];j<litcnt;j++)
                       {
                                 fprintf(ft,"(DL, 02) (C,
%s)\n",L[j].lit);
                        L[j].addr=lc++;
                         }
                       lc--;
                                pooltab[++poolcnt] = litcnt;
                  fprintf(ft,"(AD, %02d)\n",i);
                            break;
                          }
                           else
                           {
                            for(j=pooltab[poolcnt];j<litcnt;j++)
                          {
```

```
                                fprintf(ft,"(DL, 02) (C,
%s)\n",L[j].lit);
                        L[j].addr=lc++;
                       }
                     lc--;
                         pooltab[++poolcnt]=litcnt;
                           {

                           }
                        break;
                            }




          case 2://start ,print,read
                i=search_adtab(tok1);
               if(i==1)
               {
                  lc=atoi(tok2)-1;
                 fprintf(ft,"(AD, %02d)  (C, %s)\n",i,tok2);
                  break;
               }
                      i=search_optab(tok1);
                              if(i==9||i==10)
                             {
                                 p=search_symtab(tok2);
                                if(p==-1)
                                 {
                                strcpy(S[sc].sym,tok2);
                                   S[sc].addr=000;
                               fprintf(ft,"(IS, %02d) (S,
%02d)\n",i,sc);
                                     sc++;

                                    }
                                    else
                                   fprintf(ft,"(IS, %02d)   %d    (S,
%02d)\n",i,k,p);


                                   break;
                                }


               case 3:          i=search_optab(tok1);
                                if(i>=1 && i<=8)
                                {
                                     tok2[strlen(tok2)-1]='\0';
```

```
                                        k=search_regtab(tok2);

                                                                if(k==-1)
                                                                {

//fprintf(ft,"\n error handler ");

fprintf(ft," error register %s is  not found\n",tok2);

break;
                                                                 }

                                        //mover areg,='5'
                                        if(tok3[0]=='=')
                                        {
                                              j=search_littab(tok3);
                                              if(j==-1)
                                              {

      strcpy(L[litcnt].lit,tok3);
                                                    fprintf(ft,"(IS,
%02d) %02d  (L, %02d)\n",i,k,litcnt);
                                                    litcnt++;
                                              }
                                              else
                                              {
                                                    fprintf(ft,"(IS,
%02d)      %02d  (L, %02d)\n",i,k,j);
                                              }
                                              break;

                                        }

                                        else//mover areg,A
                                        {
                                              p=search_symtab(tok3);
                                              if(p==-1)
                                              {

      strcpy(S[sc].sym,tok3);
                                                    fprintf(ft,"(IS,
%02d)      %02d  (S, %02d)\n",i,k,sc);
                                                    sc++;
                                              }
                                              else
                                              {
                                                    fprintf(ft,"(IS,
%02d)      %02d  (S, %02d)\n",i,k,p);
                                              }
                                              break;
                                        }
                                  }
```

```
                                    //A DS 2
                                    if(strcmp(tok2,"DS")==0)
                                    {
                                          p=search_symtab(tok1);
                                          if(p==-1)
                                          {
                                                strcpy(S[sc].sym,tok1);
                                                S[sc].addr=lc;
                                                fprintf(ft,"(DL, 2)    (C,
%s)\n",tok3);
                                                sc++;
                                          }
                                          else
                                          {
                                                S[p].addr=lc;
                                                fprintf(ft,"(DL, 2)    (C,
%s)\n",tok3);
                                          }
                                          lc=lc+atoi(tok3)-1;
                                          break;
                                    }
                              //C DC 2
                               if(strcmp(tok2,"DC")==0)
                               {
                                   p=search_symtab(tok1);
                                 if(p==-1)
                                          {
                                                strcpy(S[sc].sym,tok1);
                                                S[sc].addr=lc;
                                                fprintf(ft,"(DL, 01)   (C,
%s)\n",tok3);
                                                sc++;
                                          }
                                          else
                                          {
                                                S[p].addr=lc;
                                                fprintf(ft,"(DL, 01)
      (C, %s)\n",tok3);
                                          }
                               lc++;

                                  break;
                               }


case 5:  //equ
          i=search_adtab(tok2);

            if(i==4)
            {
               p=search_symtab(tok3);
```

```
                z=S[p].addr;

                 x=atoi(tok5);
               if(strcmp(tok4,"+")==0)
               {

                   z=x+z;
                }
              else
               {
                  z=x-z;
               }
           fprintf(ft,"(AD, 05) (C, %d)\n",z);
                strcpy(S[sc].sym,tok1);
               S[sc].addr=z;
                sc++;
          break;
          }
      }
    if(n==2||n==1)
  lc++;


     }

     fcloseall();

}


void print_file(char *target)
{
     FILE *fp;
     fp=fopen(target,"r");
     if(fp==NULL)
     {
          printf("\nfile does not exist!!!");

          exit(0);
      }
      printf("\n\n");
      while(fgets(buffer,80,fp))
      {
          printf("%s",buffer);
      }
      fclose(fp);

}

void print_littab()
{
```

```
      int i;
      printf("\n LITERAL\tADDRESS\n");
      for(i=0;i<litcnt;i++)
      {
            printf("%s\t%d\n",L[i].lit,L[i].addr);
      }
}

void print_symtab()
{
      int p=0;
      printf("\n SYMBOL\tADDRESS\n");
      while(p<sc)
      {
            printf("%s\t%d\n",S[p].sym,S[p].addr);
            p=p+1;
      }
}


void pass2()
{
      int i,j,k,n,p,x;
      char temp[20];

      if((fs=fopen("id.txt","r"))==NULL)
      {
            printf("\n\nerror in opening file..");

            exit(0);
      }

      if((ft=fopen("tar.txt","w"))==NULL)
      {
            printf("\n\nerror in opening file..");

            exit(0);
      }

      lc=0;
      while(fgets(buffer,80,fs))
      {
            n=sscanf(buffer,"%s%s%s%s%s",tok1,tok2,tok3,tok4,tok5);
            switch(n)
            {
                  case 2:
                                    tok2[strlen(tok2)-1]='\0';
                                    i=atoi(tok2);
                                    if(i==2||i==5)
                                    {
                                          for(j=0;j<poolcnt;j++)
                                          {
```

```
                                        if(L[pooltab[j]].addr==lc)
                                             break;
                                   }


     for(k=pooltab[j];k<pooltab[j+1];k++)
                                   {
                                        strcpy(temp,L[k].lit);
                                        temp[strlen(temp)-1]='\0';
                                        fprintf(ft,"%d       %s
     \n",lc++,strstr(temp,"'")+1);
                                   }
                                   lc--;
                                   break;
                              }

                              fprintf(ft,"%d) 00    0     00\n",lc);
                              break;


               case 4:    if(strcmp(tok1,"(AD,")==0)
                              {
                              if(strcmp(tok2,"01)")==0)
                                        {
                                   tok4[strlen(tok4)-1]='\0';
                                    lc=atoi(tok4)-1;

                                    break;
                                             }
                                        else
                                          {
                                            fprintf(ft," - - -
\n");
                                               lc--;
                                             break;
                                           }
                              }

                              if(strcmp(tok1,"(DL,")==0)
                              {
                                   tok2[strlen(tok2)-1]='\0';
                                   tok4[strlen(tok4)-1]='\0';
                                   i=atoi(tok2);


if(strcmp(tok4,"='")>0)
                                                  {
                                                     x=0;

for(j=2;j<strlen(tok4)-1;j++,x++)
 {
b[x]=tok4[j];
```

```
}
                                                                    //
j=atoi(tok4);


fprintf(ft,"%d) 00 00 00%s\n",lc++,b);
                                                                    }

                                                                 else
                                                                    {
                                                                    j=atoi(tok4);

                                                 if(i==2)   // A DS 2
                                                 {
                                                       for(k=0;k<j;k++)
                                                       {

      fprintf(ft,"%d)\n",lc++);
                                                       }
                                                       lc--;
                                                 }
                                                 if(i==1)
                                                 {
                                                  fprintf(ft,"%d)\n",lc++);
                                                 }
                                                  }
                                                 break;
                                           }
                                 if(strcmp(tok1,"(IS,")==0)
                                  {
                                    tok2[strlen(tok2)-1]='\0';
                           tok4[strlen(tok4)-1]='\0';
                            i=atoi(tok2);
                                 k=atoi(tok4);
                                  if(S[k].addr==0)
                                    fprintf(ft,"%d) %s not
defined\n",lc,S[k].sym);
                                    else
                               fprintf(ft,"%d)       %02d  00
%03d\n",lc,i,S[k].addr);


                                    break;
                                  }

                        case 5:                 tok2[strlen(tok2)-1]='\0';
                                                tok5[strlen(tok5)-1]='\0';
                                                i=atoi(tok2);
                                                j=atoi(tok3);
                                                k=atoi(tok5);

                                                if(strcmp(tok4,"(S,")==0)
```

```
                                        {
                                              fprintf(ft,"%d    %02d  %d
      %03d\n",lc,i,j,S[k].addr);
                                        }
                                        else
                                        {
                                              fprintf(ft,"%d    %02d  %d
      %03d\n",lc,i,j,L[k].addr);
                                        }
                                        break;
            }
            lc++;

      }//while
      fcloseall();
}


void main()
{

      printf("\n enter source file name: \n");
      scanf("%s",source);

      printf("\n source code is: \n ");
      print_file(source);

      pass1();

      printf("\n\n literal table: \n");
      print_littab();

      printf("\n\n symbol table: \n");
      print_symtab();



      printf("\n intermediate code is: \n");
      print_file("id.txt");


      pass2();
      printf("\n\n\n target code....");
      print_file("tar.txt");



}
```