TWO PASS ASSEMBLER

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18

PASS ONE
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```
#include<stdio.h>
#include<string.h>

void main()
{
	int locctr=0,f=0,start=0;
	char c,label[10],opcode[10],operand[10],symname[10];
	FILE *f1,*f2,*f3,*f4;
	f1=fopen("input.txt","r");
	f2=fopen("intermediate.txt","w");
	f3=fopen("symbol.txt","r+");
	f4=fopen("size.txt","w");
	while((c=fgetc(f1))!=EOF)
	{
		fscanf(f1," %s\t %s\t %s",label,opcode,operand);
		if(!strcmp(opcode,"START"))
		{
			start=atoi(operand);
			locctr=atoi(operand);
			fprintf(f2," %d\t%s\t%s\t%s\n",locctr,label,opcode,operand);
		}
		else
			locctr=0;
		while(strcmp(opcode,"END"))
		{
			fscanf(f1,"%s\t%s\t%s",label,opcode,operand);
			fprintf(f2," %d\t%s\t%s\t%s\n",locctr,label,opcode,operand);
			if(label[0]!='#')
			{
				if(strcmp(label,"-"))
				{
					rewind(f3);
					while(!feof(f3))
					{
						fscanf(f3,"%s",symname);
						if(!strcmp(symname,label))
						{
							f=1;
							printf("\nDuplicate label\n");
							break;
						}
					}
					if(f==0)
						fprintf(f3,"%s\t%d\n",label,locctr);
				}
				if(!strcmp(opcode,"WORD"))
					locctr+=3;
				else if(!strcmp(opcode,"RESW"))
```

```
                                        locctr=locctr+(3*atoi(operand));
                                else if(!strcmp(opcode,"RESB"))
                                        locctr=locctr+atoi(operand);
                                else if(!strcmp(opcode,"BYTE"))
                                        locctr=locctr+strlen(operand)-3;
                                else
                                        locctr+=3;
                        }
                }
                printf("\nThe length of the program : %d\n",locctr-start-3);
                fprintf(f4,"%d",locctr-start-3);
                break;
        }
        fclose(f1);
        fclose(f2);
        fclose(f3);
        fclose(f4);
}
```

PASS TWO
****

```
#include<stdio.h>
#include<string.h>

void main()
{
	int locctr=0,fo=0,fs=0,start=0,size,oploc,symval;
	char c,label[10],opcode[10],operand[10],symname[10],opname[10];
	FILE *f1,*f2,*f3,*f4,*f5;
	f1=fopen("code.txt","w+");
	f2=fopen("intermediate.txt","r");
	f3=fopen("symbol.txt","r+");
	f4=fopen("size.txt","r+");
	f5=fopen("optab.txt","r+");
	while(!feof(f2))
	{
		fscanf(f2," %d\t%s\t%s\t%s\n",&locctr,label,opcode,operand);
		fscanf(f4,"%d",&size);
		if(!strcmp(opcode,"START"))
		{
			start=atoi(operand);
			fscanf(f2," %d\t%s\t%s\t%s\n",&locctr,label,opcode,operand);
		}
		fprintf(f1,"H^%d^%d^\n",start,size);
		fprintf(f1,"T^%d^%d^",start,size);
		while(strcmp(opcode,"END"))
		{

			if(label[0]!='#')
			{
				rewind(f5);
				while(!feof(f5))
				{
					fscanf(f5,"%s\t%d",opname,&oploc);

					if(!strcmp(opname,opcode))
					{
						fo=1;
						break;
					}
				}
				if(fo==1)
				{
					fprintf(f1,"%d",oploc);
					fo=0;
					rewind(f3);
					while(!feof(f3))
					{
						fscanf(f3,"%s\t%d",symname,&symval);
						if(!strcmp(symname,operand))
						{
							fs=1;
							break;
						}
					}
					if(fs==1)
					{
```

```
                                        fs=0;
                                        fprintf(f1,"%d",symval);
                                }
                        }
                        if(!strcmp(opcode,"BYTE") || !strcmp(opcode,"WORD"))
                        {
                                if(!strcmp(opcode,"BYTE"))
                                        fprintf(f1,"0000%d",operand[2]);
                                else
                                        fprintf(f1,"00000%d",atoi(operand));
                        }
                }
                if(strcmp(opcode,"RESB") || strcmp(opcode,"RESW"))
                fprintf(f1,"^");
                fscanf(f2," %d\t%s\t%s\t%s\n",&locctr,label,opcode,operand);
        }
    }
    fprintf(f1,"\nE^%d^\n",start);
    fclose(f1);
    fclose(f2);
    fclose(f3);
    fclose(f4);
    fclose(f5);
}
```

INPUT.TXT
****

```
COPY START 1000
- LDA FIVE
- STA NUM1
- LDCH NUM2
- STCH C1
NUM1 RESW 1
FIVE WORD 5
NUM2 BYTE C'Z'
C1 RESB 1
- END -
```

SYMBOL.TXT
****

NUM1	1012
FIVE	1015
NUM2	1018
C1	1019

OPTAB.TXT
****

LDA	15
STA	32
LDCH	12
STCH	13

INTERMEDIATE.TXT
****

1000	COPY	START	1000
1000	-	LDA	FIVE
1003	-	STA	NUM1
1006	-	LDCH	NUM2
1009	-	STCH	C1
1012	NUM1	RESW	1
1015	FIVE	WORD	5
1018	NUM2	BYTE	C'Z'
1019	C1	RESB	1
1020	-	END	-

CODE.TXT
****

```
H^1000^20^
T^1000^20^151015^321012^121018^131019^^000005^000090^^
E^1000^
```