PROGRAM

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
FILE *fop, *finput, *fout, *fsymtab, *flen;
int o=-1, s=-1, i=0,opd, locctr, start, size=0, flag, len;
char opcode[10], operand[10], label[10], t1[10], t2[10], t3[10];
struct optab{
   char opcode[10], hexcode[10];
}OT[30];
struct symtab{
   char label[10];
   int addr;
}ST[30];
void read_optab(){
   while(1){
      o++;
      fscanf(fop, "%s%s", OT[o].opcode, OT[o].hexcode);
      if(getc(fop)==EOF) break;
   }
}
void read_line(){
   strcpy(t1, "");
   strcpy(t2, "");
   strcpy(t3, "");
   fscanf(finput, "%s", t1);
   if(getc(finput)!='\n'){
      fscanf(finput, "%s", t2);
      if(getc(finput)!='\n'){
         fscanf(finput, "%s", t3);
      }
   }
   if(strcmp(t1,"")!=0 && strcmp(t2,"")!=0 && strcmp(t3,"")!=0){
      strcpy(label, t1);
      strcpy(opcode, t2);
      strcpy(operand, t3);
   }
```

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    else if(strcmp(t1,"")!=0 && strcmp(t2,"")!=0 && strcmp(t3,"")==0){
        strcpy(label, "");
        strcpy(opcode, t1);
        strcpy(operand, t2);
    }else if(strcmp(t1,"")!=0 && strcmp(t2,"")==0 && strcmp(t3,"")==0){
        strcpy(label, "");
        strcpy(opcode, t1);
        strcpy(operand, "");
    }
}
int main(){
    finput = fopen("input.txt", "r");
    fop = fopen("opcode.txt", "r");
    fsymtab = fopen("symtab.txt", "w");
    fout = fopen("intermediate.txt", "w");
    flen = fopen("length.txt", "w");
    read_optab();
    fscanf(finput,"%s%x",opcode,&opd);
    if(strcmp(opcode, "START")==0){
        start = opd;
        locctr = start;
        fprintf(fout, "\t\t%s\t%x\n", opcode, opd);
        read_line();
    }else{
        locctr = 0;
    }
    while(strcmp(opcode, "END")!=0){
        fprintf(fout, "%x\t%s\t%s\t%s\n", locctr, label, opcode, operand);
        if(strcmp(label, "")!=0){
            for(i=0; i<=s;i++){
                if(strcmp(ST[i].label, label)==0){
                    printf("Error");
                    exit(0);
                }
            }
            s++;
            strcpy(ST[s].label, label);
```

```
        ST[s].addr = locctr;
    }
    flag = 0;
    for(i=0; i<=0; i++){
        if(strcmp(OT[i].opcode, opcode)==0){
            locctr += 3;
            size += 3;
            flag = 1;
            break;
        }
    }
    if(flag==0){
        if(strcmp(opcode, "WORD")){
            locctr += 3;
            size += 3;
        }else if(strcmp(opcode, "RESW")){
            locctr += (3*atoi(operand));
        }else if(strcmp(opcode, "RESB")){
            locctr += (atoi(operand));
        }else if(strcmp(opcode, "BYTE")){
            len = strlen(operand);
            if(operand[0]=='C' || operand[0]=='c'){
                len -= 3;
            }else{
                len = (len-3)/2;
            }
            locctr += len;
            size += len;
        }
    }
    read_line();
}
fprintf(fout, "%x\t%s\t%s\t%s\n", locctr, label, opcode, operand);
for(i=0; i<=s; i++){
    fprintf(fsymtab, "%s\t%x", ST[i].label, ST[i].addr);
    if (i!=s){
        fprintf(fsymtab, "\n");
```

```
        }
    }
    fprintf(flen, "%x\n%x", locctr-start, size);
    fclose(finput);
    fclose(fop);
    fclose(fsymtab);
    fclose(fout);
    fclose(flen);
}
```

SAMPLE INPUT

---

input.txt

```
            START       2000
            LDA         FIVE
            STA         ALPHA
            LDCH        CHARZ
            STCH        C1
ALPHA       RESW        1
FIVE        WORD        5
CHARZ       BYTE        C'Z'
C1          RESB        1
            END
```

opcode.txt

```
LDA     03
STA     0F
LDCH    53
STCH    57
```

SAMPLE OUTPUT

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intermediate.txt

```
                START     2000
2000            LDA       FIVE
2003            STA       ALPHA
2006            LDCH      CHARZ
2009            STCH      C1
```

200c	ALPHA	RESW	1
200f	FIVE	WORD	5
201e	CHARZ	BYTE	C'Z'
2021	C1	RESB	1
2024	END		

symtab.txt

ALPHA	200c
FIVE	200f
CHARZ	201e
C1	2021

length.txt

24

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