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| **Ex.no.12** | **IMPLEMENT THE BACK END OF A COMPILER** |

#include<stdio.h>

#include<stdlib.h>

#include<string.h>

int isoper(char c){

char oper[8]= {'+','-','\*','/','=','>','<','%'};

int i;

for(i=0;i<8;i++){

if(oper[i] == c)

return 1;

}

return 0;

}

char \*getr(char s[],int ri){

char \*cd = (char\*)malloc(10\*sizeof(char));

char \*rstr = (char\*)malloc(10\*sizeof(char));

strcpy(cd,s);

strcat(cd," R[");

sprintf(rstr,"%d",ri);

strcat(cd,rstr);

strcat(cd,"]");

return cd;

}

int main(){

FILE \*fp = fopen("in","r");

char line[50],tline[10],lines[50][50];

char code[40][30];int ci=0;

int ri=0,nl=0,i=0;char \*rstr =(char\*)malloc(10\*sizeof(char));

char str[10];

while(1){

fscanf(fp,"%[^\n]%\*c",lines[nl]);

if(feof(fp)>0)

break;

nl++;

}

for(i=0;i<nl;i++){

if(strlen(lines[i])==3 && lines[i][1]=='='){

strcpy(code[ci],getr("MOV",ri));

strcat(code[ci],",");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][2];

printf("\n%s",code[ci]);

ci++;

strcpy(code[ci],"");

strcpy(code[ci],"MOV ");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][0];

strcat(code[ci],",R[");

sprintf(rstr,"%d",ri);

strcat(code[ci],rstr);

strcat(code[ci],"]");

ri++;

printf("\n%s",code[ci]);

}

else if(lines[i][0]=='i' && lines[i][1]=='f'){

strcpy(code[ci],getr("MOV",ri));

strcat(code[ci],",");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][3];

printf("\n%s",code[ci]);

ci++;ri++;

strcpy(code[ci],getr("MOV",ri));

strcat(code[ci],",");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][5];

printf("\n%s",code[ci]);

ci++;ri++;

strcpy(code[ci],getr("SUB",ri));

strcat(code[ci],",");

strcat(code[ci],getr("",ri-2));

strcat(code[ci],",");

strcat(code[ci],getr("",ri-1));

printf("\n%s",code[ci]);

ci++;

ri++;

if(lines[i][4] == '<')

strcpy(code[ci],"JLTZ");

else if(lines[i][4] =='>')

strcpy(code[ci],"JGTZ");

strcat(code[ci]," ");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][strlen(lines[i])-1];

printf("\n%s",code[ci]);

ri++;ci++;

}

else

{

if(strlen(lines[i])>4)

{

strncpy(str,lines[i],4);

str[4]='\0';

if(strcmp(str,"goto")==0)

{

strcpy(code[ci],"JMP ");

code[ci][strlen(code[ci])+1]='\0';

code[ci][strlen(code[ci])]=lines[i][strlen(lines[i])-1];

printf("\n%s",code[ci]);

ci++;

}

}

}

}

printf("\n");

return 0;

}

## root@AumrudhLalKumarTJ:~/lab/systemsoftware/ex\_11# ./a.out

## MOV R[0],y

## MOV x,R[0]

## MOV R[1],a

## MOV R[2],b

## SUB R[3], R[1], R[2]

## JLTZ M

## JMP L

## MOV R[5],x

## MOV i,R[5]

## root@AumrudhLalKumarTJ:~/lab/systemsoftware/ex\_11# cat in

## x=y

## if a<b goto M

## goto L

## M:

## i=x

## L: