#include<stdio.h>

#include <string.h>

void scaner();

void E();

void E1();

void T();

void T1();

void F();

void error();

char proce[100],ch,token[20];

int syn,i,j,m,sum=0;

char \*keyword[6]= {"begin","if","then","while","do","end"};

main()

{

i=0;//记录输入多少个字符

printf("\n 请输入词法分析程序:");

do{

ch=getchar();

proce[i]=ch;

i++;

}while (ch!='#');

i=0;

do{

scaner();

switch(syn)

{

case 11: printf("\n(%d,%d)",syn,sum);

break;

case -1: printf("\n(%s,#)",token);

break;

default: printf("\n(%d,%s)",syn, token);

}

}while (syn!=0);

printf("\n");

i=0;

scaner();

E();

if (syn==0)

printf("\n 语法正确. \n");

else printf("\n 语法失败. \n");

}

void scaner()

{

for (j=0;j<20;j++)

token[j]=NULL;//将token赋值为空

m=0;

sum=0;

ch=proce[i];

i++;

while (ch==' ')

{

ch=proce[i++];

}

if (ch>='a'&& ch<='z')

{while (ch>='a'&& ch<='z'||ch>='0' && ch<='9')

{

token[m++]=ch;

ch=proce[i++];//继续看后面的

}

syn=10;i--;//判断为变量

for (j=0;j<6;j++)

if(strcmp(token,keyword[j])==0)

{

syn=j+1;

break;

}//如果有可以匹配的就为关键字

}

else

if(ch>='0' && ch<='9')

{while (ch>='0' && ch<='9')

{

sum=sum\*10+(ch-'0');

ch=proce[i];

i++;

}

syn=11;

i--;

}

else

switch(ch)

{

case '<': token[m]=ch;

m++;

ch=proce[i];

i++;

if (ch=='>')

{

syn=21;

token[m]=ch;

m++;

}

else if (ch=='=')

{

syn=22;

token[m]=ch;

m++;

}

else

{

syn=20;

i--;

}

break;

case '>': m=0;

token[m]=ch;

m++;

ch=proce[i];

i++;

if (ch=='=')

{

syn=24;

token[m]=ch;

m++;

}

else

{

syn=23;

i--;

}

break;

case ':': m=0;

token[m++]=ch;

ch=proce[i++];

if (ch=='=')

{

syn=18;

token[m++]=ch;

}

else

{

syn=17;

i--;

}

break;

case '+':

syn=13;

token[0]=ch;

break;

case '-':

syn=14;

token[0]=ch;

break;

case '\*':

syn=15;

token[0]=ch;

break;

case '/':

syn=16;

token[0]=ch;

break;

case '=':

syn=25;

token[0]=ch;

break;

case ';':

syn=26;

token[0]=ch;

break;

case '(':

syn=27;

token[0]=ch;

break;

case ')':

syn=28;

token[0]=ch;

break;

case '#':

syn=0;

token[0]=ch;

break;

default:

syn=-1;

token[0]=ch;

}

}

void E()

{

printf("E ");

T();

E1();

}

void E1()

{

printf("E1 ");

if (syn==13)

{

scaner();

T();

E1();

}

else {

if (syn!=28 && syn!=0)

error();

}

}

void T()

{

printf("T ");

F();

T1();

}

void T1()

{

printf("T1 ");

if (syn==15) {

scaner();

F();

T1();

}

else {

if (syn!=28 && syn!=0 && syn!=13) error();

}

}

void F()

{

printf("F ");

if (syn==27)

{

scaner();

E();

if(syn==28) scaner();

else error();

}

else if (syn==11 || syn==10)

scaner();

}

void error()

{

printf("\n (%d,%s)语法错误! \n",syn, token);

}