#include<iostream>

#include<string>

#include<regex>

#include<stdlib.h>

#include<cstdio>

using namespace std;

int lc=0,x=0; //x=global integer,lc=location counter

struct program

{

char line[80];

}s1[100];

struct ST

{

string segment;

string var;

string type;

string Dtype;

int lc;

} st[100];

int segment(string S,int lc,int x,int y)

{

int p0,p;

string a=s1[y].line,test;

p0=a.find("ends");

p=a.find("db");

int p1=a.find("dw");

int p2=a.find("dd");

int p4=a.find(":");

regex DEC("[0-9]+");

regex VARDEC("[a-zA-z]+[0-9]+]");

regex HEX("[0-9]+[h]");

if(p0>0)

{

return y++;;

}

else if(p>0 || p1>0 ||p2>0 || p4>0)

{

if(p>=0 )

{

test=a.substr(p+2,a.length());

if(regex\_match(test,HEX) || regex\_match(test,DEC) || regex\_match(a.substr(0,p),VARDEC) )

{

cout<<"a";

p=a.find("db");

st[x].var=a.substr(0,p);

int count=1;

st[x].lc=lc;

for(int k=p;k<a.length();k++)

{

if(a[p]==',')

{

count++;

}

}

p=a.find("dup");

char g[10];

int f=0;

if(p>=0)

{

p=p+3;

g[f]=a[++p];

cout<<g[f]<<endl;

while(a[++p]!=')')

{

g[++f]=a[p];}

}

f=atoi(g);

count\*=f;

lc=lc+count;

st[x].segment=p;

segment(S,lc,++x,++y);

}

else

{

cout<<"error";

exit(0);

}

}

else if(p1>=0 )

{

if(regex\_match(a.substr(p+2,a.length()),HEX) || regex\_match(a.substr(p+2,a.length()),DEC) || regex\_match(a.substr(0,p1),VARDEC))

{

p=a.find("dw");

st[x].var=a.substr(0,p);

int count=2;

st[x].lc=lc;

for(int k=p;k<a.length();k++)

{

if(a[p]==',')

{

count+=2;;}

}

p=a.find("dup");

char g[10];

int f=0;

if(p>=0)

{

p=p+3;

g[f]=a[++p];

cout<<g[f]<<endl;

while(a[++p]!=')')

{

g[++f]=a[p];}}

f=atoi(g);

count\*=f;

lc=lc+count;

st[x].type="var11";

st[x].segment=S;

return segment(S,lc,++x,++y);

}

else

{

cout<<"error";

}

}

else if(p2>=0 )

{

if(regex\_match(a.substr(p+2,a.length()),HEX) || regex\_match(a.substr(p+2,a.length()),DEC) || regex\_match(a.substr(0,p2),VARDEC))

{

p=a.find("dd");

st[x].var=a.substr(0,p);

int count=4;

st[x].lc=lc;

for(int k=p;k<a.length();k++)

{

if(a[p]==',')

{

count+=4;

}

}

p=a.find("dup");

char g[10];

int f=0;

if(p>=0)

{

p=p+3;

g[f]=a[++p];

cout<<g[f]<<endl;

while(a[++p]!=')')

{

g[++f]=a[p];}}

f=atoi(g);

count\*=f;

lc=lc+count;

st[x].type="var";

st[x].segment=S;

return segment(S,lc,++x,++y);

}

else

{

cout<<"error";

exit(0);

}

}

else if(p4>=0)

{

st[x].var=a.substr(0,p4);

st[x].lc=lc;

st[x].segment=S;

st[x].type="label";

return segment(S,lc,++x,++y);

}

else

{

cout<<"error";

exit(0);

}

}

else

{

cout<<"error";

}

}

int main()

{

int i=0,y=0,x=0,p;

cout<<"Enter the code:";

do

{

gets(s1[i].line);

}

while(strcmp(s1[i++].line,"end start"));

while(y<i)

{ string a=s1[y].line;

if(a.find("segment")>=0 || a.find("SEGMENT"))

{

p=a.find("segment");

st[x].var=a.substr(0,p);

st[x].segment="itself";

st[x].type="segment";

st[x].lc=0;

y=segment(st[x].var,st[x].lc,++x,++y);

}

}

}