// Assign 2 : Pass 2 of 2 Pass Assembler

import java.text.DecimalFormat;

class symtab{

int index;

String name;

int addr;

symtab(int i,String s,int a){

index = i;

name = s;

addr = a;

}

}

class littab{

int index;

String name;

int addr;

littab(int i,String s,int a){

index = i;

name = s;

addr = a;

}

void setaddr(int a){

addr = a;

}

}

public class pass2 {

public static void main(String[] args) {

String ic[][] = {{"(AD,01)",null,"(C,100)"},

{"(IS,04)","(RG,01)","(L,0)"},

{"(IS,01)","(RG,03)","(L,1)"},

{"(DL,01)",null,"(C,3)"},

{"(IS,04)","(RG,01)","(S,2)"},

{"(IS,01)","(RG,01)","(S,3)"},

{"(IS,05)","(RG,01)","(S,4)"},

{"(DL,02)",null,"(C,5)"},

{"(DL,02)",null,"(C,1)"},

{"(AD,04)",null,"(C,103)"},

{"(IS,10)",null,"(S,4)"},

{"(AD,03)",null,"(C,101)"},

{"(IS,02)","(RG,01)","(L,2)"},

{"(IS,03)","(RG,03)","(S,2)"},

{"(DL,02)",null,"(C,5)"},

{"(AD,03)",null,"(C,111)"},

{"(IS,00)",null,null},

{"(DL,02)",null,"(C,19)"},

{"(AD,02)",null,null},

{"(DL,02)",null,"(C,1)"}};

symtab s[] = new symtab[20];

littab l[] = new littab[20];

s[0] = new symtab(0,"A",102);

s[1] = new symtab(1,"L1",105);

s[2] = new symtab(2,"B",112);

s[3] = new symtab(3,"C",103);

s[4] = new symtab(4,"D",103);

l[0] = new littab(0,"='5'",108);

l[1] = new littab(1,"='1'",109);

l[2] = new littab(2,"='1'",113);

int i=0,j=0,ind=0;

String m,op1,op2,temp;

char arr1[],arr2[],arr3[];

DecimalFormat df = new DecimalFormat("000");

while(i < ic.length){

temp = null;

arr1 = null;

arr2 = null;

arr3 = null;

m = ic[i][0];

op1 = ic[i][1];

op2 = ic[i][2];

arr1 = m.toCharArray();

if(op1 != null){

arr2 = op1.toCharArray();

}

if(op2 != null){

arr3 = op2.toCharArray();

}

if(arr1[1] == 'I' && arr1[2] == 'S'){

System.out.print(arr1[4]+""+arr1[5]+"\t");

if(op1 != null){

System.out.print(arr2[4]+""+arr2[5]+"\t");

}else{

System.out.print("00"+"\t");

}

if(op2 != null){

if(arr3[1] == 'R' && arr3[2] == 'G'){

System.out.print(arr3[4]+arr3[5]+"\t");

}

else if(arr3[1] == 'S'){

ind = Character.getNumericValue(arr3[3]);

j=4;

while(arr3[j] != ')'){

ind = ind\*10;

ind = ind + (Character.getNumericValue(arr3[j]));

j++;

}

System.out.print(s[ind].addr+"\t");

}

else if(arr3[1] == 'L'){

ind = Character.getNumericValue(arr3[3]);

j=4;

while(arr3[j] != ')'){

ind = ind\*10;

ind = ind + (Character.getNumericValue(arr3[j]));

j++;

}

System.out.print(l[ind].addr+"\t");

}

}else{

System.out.print("000"+"\t");

}

}

else if(arr1[1] == 'D' && arr1[2] == 'L'){

if(arr1[5] == '2'){

System.out.print("00\t00\t");

j=3;

while(arr3[j] != ')'){

if(temp == null)

temp = String.valueOf(arr3[j]);

else

temp = temp.concat(String.valueOf(arr3[j]));

j++;

}

System.out.print(df.format(Integer.parseInt(temp)));

}

}

i++;

System.out.print("\n");

}

}

}

/\*

OUTPUT

04 01 108

01 03 109

04 01 112

01 01 103

05 01 103

00 00 005

00 00 001

10 00 103

02 01 113

03 03 112

00 00 005

00 00 000

00 00 019

00 00 001

\*/