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/*
 *  Program for Pass II of Two-Pass Assembler

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 */

package SPOS;

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)"},
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            {"(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");
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                        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++;
                              }
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        System.out.print(df.format(Integer.parseInt(temp)));
                            }
                        }
                        i++;
                        System.out.print("\n");
                }
        }
}
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