一、 chap1 课件中的套裁问题

Lindo 代码

```
min 0x1+ 0.1x2 +0.2x3 +0.3x4 +0.8x5
st
x1+ 2x2 + x4=100
2x3+2x4 + x5 =100
3x1+ x2 +2x3 + 3x5 =100
End
```

运行结果:

```
  Global optimal solution found.
  Objective value:                              16.00000
  Infeasibilities:                              0.000000
  Total solver iterations:                             4
  Elapsed runtime seconds:                          2.61

  Model Class:                                        LP

  Total variables:                     5
  Nonlinear variables:                 0
  Integer variables:                   0

  Total constraints:                   4
  Nonlinear constraints:               0

  Total nonzeros:                     14
  Nonlinear nonzeros:                  0


                     Variable           Value        Reduced Cost
                           X2        10.00000            0.000000
                           X3        0.000000            0.000000
                           X4        50.00000            0.000000
                           X5        0.000000           0.7400000
                           X1        30.00000            0.000000

                          Row    Slack or Surplus      Dual Price
                            1        16.00000           -1.000000
                            2        0.000000       -0.6000000E-01
                            3        0.000000           -0.1200000
                            4        0.000000        0.2000000E-01
```

灵敏度分析（range）

Ranges in which the basis is unchanged:

Objective Coefficient Ranges:

Variable	Current Coefficient	Allowable Increase	Allowable Decrease
X2	0.1000000	INFINITY	0.000000
X3	0.2000000	INFINITY	0.000000
X4	0.3000000	0.000000	INFINITY
X5	0.8000000	INFINITY	0.7400000
X1	0.000000	0.000000	INFINITY

Righthand Side Ranges:

Row	Current RHS	Allowable Increase	Allowable Decrease
2	100.0000	150.0000	16.66667
3	100.0000	33.33333	100.0000
4	100.0000	50.00000	75.00000

二、chap3 课件中的运输问题

```
!transportation problem;
MODEL:
sets:
row/1,2,3/:a;
arrange/1..4/:b;
matrix(row,arrange):c,x;
endsets
data:
a=14,27,19;
b=22,13,12,13;
c=6,7,5,3,
   8,4,2,7,
   5,9,10,6;
enddata
[OBJ]min=@sum(matrix(i,j):c(i,j)*x(i,j));
@for(row(i):@sum(arrange(j):x(i,j))=a(i);); !产地约束;
@for(arrange(j):@sum(row(i):x(i,j))=b(j);); !销地约束;
END
```

Global optimal solution found.

Objective value:	232.0000
Infeasibilities:	0.000000
Total solver iterations:	6
Elapsed runtime seconds:	0.12
Model Class:	LP
Total variables:	12
Nonlinear variables:	0
Integer variables:	0
Total constraints:	8
Nonlinear constraints:	0
Total nonzeros:	36
Nonlinear nonzeros:	0

Variable	Value	Reduced Cost
A(1)	14.00000	0.000000
A(2)	27.00000	0.000000
A(3)	19.00000	0.000000
B(1)	22.00000	0.000000
B(2)	13.00000	0.000000
B(3)	12.00000	0.000000
B(4)	13.00000	0.000000
C(1, 1)	6.000000	0.000000
C(1, 2)	7.000000	0.000000
C(1, 3)	5.000000	0.000000
C(1, 4)	3.000000	0.000000
C(2, 1)	8.000000	0.000000
C(2, 2)	4.000000	0.000000
C(2, 3)	2.000000	0.000000
C(2, 4)	7.000000	0.000000
C(3, 1)	5.000000	0.000000
C(3, 2)	9.000000	0.000000
C(3, 3)	10.00000	0.000000
C(3, 4)	6.000000	0.000000
X(1, 1)	1.000000	0.000000
X(1, 2)	0.000000	5.000000
X(1, 3)	0.000000	5.000000
X(1, 4)	13.00000	0.000000
X(2, 1)	2.000000	0.000000
X(2, 2)	13.00000	0.000000
X(2, 3)	12.00000	0.000000
X(2, 4)	0.000000	2.000000
X(3, 1)	19.00000	0.000000
X(3, 2)	0.000000	8.000000
X(3, 3)	0.000000	11.00000
X(3, 4)	0.000000	4.000000

Row	Slack or Surplus	Dual Price
OBJ	232.0000	-1.000000
2	0.000000	-1.000000
3	0.000000	-3.000000
4	0.000000	0.000000
5	0.000000	-5.000000
6	0.000000	-1.000000
7	0.000000	1.000000
8	0.000000	-2.000000