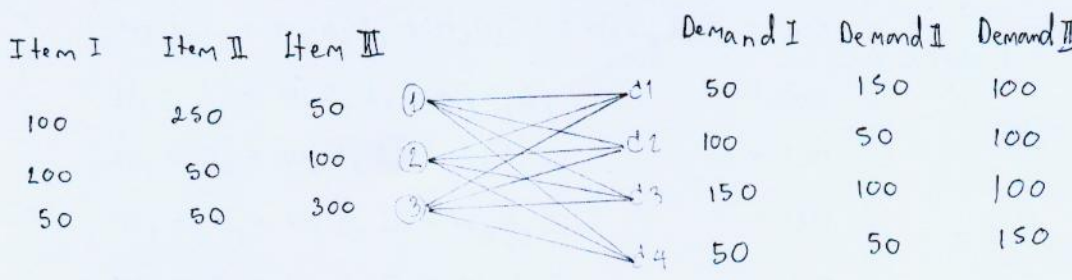


HW10

Dantzig-wolfe Decomposition

Goals



. COST.	c1			c2			c3			c4		
w1	2	4	7	3	3	6	4	2	8	5	1	5
w2	5	1	4	4	2	4	3	3	3	2	4	3
w3	4	3	2	2	4	4	4	4	5	4	3	6

Objective. $\min Z = w_1 c_1 I_1 + w_2 c_1 I_1 + w_3 c_1 I_1 + w_1 c_2 I_1 + w_2 c_2 I_1 + \dots + w_3 c_4 I_4$; $\langle \sum_{i=1}^3 \sum_{j=1}^4 \sum_{k=1}^3 w_i c_j I_k \rangle$

s.t.

$$w_1 c_1 I_1 + w_1 c_1 I_2 + w_1 c_1 I_3 \leq 125, w_2 c_1 I_1 + w_2 c_1 I_2 + w_2 c_1 I_3 \leq 125$$

$$w_3 c_1 I_1 + w_3 c_1 I_2 + w_3 c_1 I_3 \leq 125, w_1 c_2 I_1 + w_1 c_2 I_2 + w_1 c_2 I_3 \leq 125$$

$$w_2 c_2 I_1 + w_2 c_2 I_2 + w_2 c_2 I_3 \leq 125, w_3 c_2 I_1 + w_3 c_2 I_2 + w_3 c_2 I_3 \leq 125$$

$$w_1 c_3 I_1 + w_1 c_3 I_2 + w_1 c_3 I_3 \leq 125, w_2 c_3 I_1 + w_2 c_3 I_2 + w_2 c_3 I_3 \leq 125$$

$$w_3 c_3 I_1 + w_3 c_3 I_2 + w_3 c_3 I_3 \leq 125, w_1 c_4 I_1 + w_1 c_4 I_2 + w_1 c_4 I_3 \leq 125$$

$$w_2 c_4 I_1 + w_2 c_4 I_2 + w_2 c_4 I_3 \leq 125, w_3 c_4 I_1 + w_3 c_4 I_2 + w_3 c_4 I_3 \leq 125$$

$$\begin{aligned}
 w_1 c_1 I_1 + w_1 c_2 I_1 + w_1 c_3 I_1 + w_1 c_4 I_1 &= 100 \\
 w_2 c_1 I_1 + w_2 c_2 I_1 + w_2 c_3 I_1 + w_2 c_4 I_1 &= 200 \\
 w_3 c_1 I_1 + w_3 c_2 I_1 + w_3 c_3 I_1 + w_3 c_4 I_1 &= 50 \\
 w_1 c_1 I_1 + w_2 c_1 I_1 + w_3 c_1 I_1 &= 50 \\
 w_1 c_2 I_1 + w_2 c_2 I_1 + w_3 c_2 I_1 &= 100 \\
 w_1 c_3 I_1 + w_2 c_3 I_1 + w_3 c_3 I_1 &= 150 \\
 w_1 c_4 I_1 + w_2 c_4 I_1 + w_3 c_4 I_1 &= 50
 \end{aligned}
 \left. \vphantom{\begin{aligned} w_1 c_1 I_1 + w_1 c_2 I_1 + w_1 c_3 I_1 + w_1 c_4 I_1 &= 100 \\ w_2 c_1 I_1 + w_2 c_2 I_1 + w_2 c_3 I_1 + w_2 c_4 I_1 &= 200 \\ w_3 c_1 I_1 + w_3 c_2 I_1 + w_3 c_3 I_1 + w_3 c_4 I_1 &= 50 \\ w_1 c_1 I_1 + w_2 c_1 I_1 + w_3 c_1 I_1 &= 50 \\ w_1 c_2 I_1 + w_2 c_2 I_1 + w_3 c_2 I_1 &= 100 \\ w_1 c_3 I_1 + w_2 c_3 I_1 + w_3 c_3 I_1 &= 150 \\ w_1 c_4 I_1 + w_2 c_4 I_1 + w_3 c_4 I_1 &= 50 \end{aligned}} \right\} \text{Item I}$$

$$\begin{aligned}
 w_1 c_1 I_2 + w_1 c_2 I_2 + w_1 c_3 I_2 + w_1 c_4 I_2 &= 250 \\
 w_2 c_1 I_2 + w_2 c_2 I_2 + w_2 c_3 I_2 + w_2 c_4 I_2 &= 50 \\
 w_3 c_1 I_2 + w_3 c_2 I_2 + w_3 c_3 I_2 + w_3 c_4 I_2 &= 50 \\
 w_1 c_1 I_2 + w_2 c_1 I_2 + w_3 c_1 I_2 &= 150 \\
 w_1 c_2 I_2 + w_2 c_2 I_2 + w_3 c_2 I_2 &= 50 \\
 w_1 c_3 I_2 + w_2 c_3 I_2 + w_3 c_3 I_2 &= 100 \\
 w_1 c_4 I_2 + w_2 c_4 I_2 + w_3 c_4 I_2 &= 50
 \end{aligned}
 \left. \vphantom{\begin{aligned} w_1 c_1 I_2 + w_1 c_2 I_2 + w_1 c_3 I_2 + w_1 c_4 I_2 &= 250 \\ w_2 c_1 I_2 + w_2 c_2 I_2 + w_2 c_3 I_2 + w_2 c_4 I_2 &= 50 \\ w_3 c_1 I_2 + w_3 c_2 I_2 + w_3 c_3 I_2 + w_3 c_4 I_2 &= 50 \\ w_1 c_1 I_2 + w_2 c_1 I_2 + w_3 c_1 I_2 &= 150 \\ w_1 c_2 I_2 + w_2 c_2 I_2 + w_3 c_2 I_2 &= 50 \\ w_1 c_3 I_2 + w_2 c_3 I_2 + w_3 c_3 I_2 &= 100 \\ w_1 c_4 I_2 + w_2 c_4 I_2 + w_3 c_4 I_2 &= 50 \end{aligned}} \right\} \text{Item II}$$

$$\begin{aligned}
 w_1 c_1 I_3 + w_1 c_2 I_3 + w_1 c_3 I_3 + w_1 c_4 I_3 &= 150 \\
 w_2 c_1 I_3 + w_2 c_2 I_3 + w_2 c_3 I_3 + w_2 c_4 I_3 &= 50 \\
 w_3 c_1 I_3 + w_3 c_2 I_3 + w_3 c_3 I_3 + w_3 c_4 I_3 &= 100 \\
 w_1 c_1 I_3 + w_2 c_1 I_3 + w_3 c_1 I_3 &= 50 \\
 w_1 c_2 I_3 + w_2 c_2 I_3 + w_3 c_2 I_3 &= 50 \\
 w_1 c_3 I_3 + w_2 c_3 I_3 + w_3 c_3 I_3 &= 100 \\
 w_1 c_4 I_3 + w_2 c_4 I_3 + w_3 c_4 I_3 &= 300
 \end{aligned}
 \left. \vphantom{\begin{aligned} w_1 c_1 I_3 + w_1 c_2 I_3 + w_1 c_3 I_3 + w_1 c_4 I_3 &= 150 \\ w_2 c_1 I_3 + w_2 c_2 I_3 + w_2 c_3 I_3 + w_2 c_4 I_3 &= 50 \\ w_3 c_1 I_3 + w_3 c_2 I_3 + w_3 c_3 I_3 + w_3 c_4 I_3 &= 100 \\ w_1 c_1 I_3 + w_2 c_1 I_3 + w_3 c_1 I_3 &= 50 \\ w_1 c_2 I_3 + w_2 c_2 I_3 + w_3 c_2 I_3 &= 50 \\ w_1 c_3 I_3 + w_2 c_3 I_3 + w_3 c_3 I_3 &= 100 \\ w_1 c_4 I_3 + w_2 c_4 I_3 + w_3 c_4 I_3 &= 300 \end{aligned}} \right\} \text{Item III}$$

$$w_i c_j I_k \geq 0 \quad \forall i, j, k$$

21 மார்ச்

	சொல் 1	2	3	4	5	6	7	கூடுதல் மொத்தம்
w1c1i1	25	0	0	0	25	0	0	50
w2c1i1	0	0	0	0	0	0	0	-
w3c1i1	0	0	0	0	0	0	0	-
w1c2i1	25	0	0	0	25	0	0	50
w2c2i1	0	0	0	0	25	0	0	25
w3c2i1	25	0	0	0	0	0	0	25
w1c3i1	0	0	0	0	0	0	0	-
w2c3i1	75	0	0	0	50	0	0	125
w3c3i1	0	0	0	0	25	0	0	25
w1c4i1	0	0	0	0	0	0	0	-
w2c4i1	25	0	0	0	25	0	0	50
w3c4i1	0	0	0	0	0	0	0	-
w1c1i2	25	0	0	50	0	0	0	75
w2c1i2	25	0	0	25	0	0	0	50
w3c1i2	25	0	0	0	0	0	0	25
w1c2i2	25	0	0	0	0	0	0	25
w2c2i2	0	0	0	0	0	0	0	-
w3c2i2	0	0	0	25	0	0	0	25
w1c3i2	50	0	0	50	0	0	0	100
w2c3i2	0	0	0	0	0	0	0	-
w3c3i2	0	0	0	0	0	0	0	-
w1c4i2	25	0	0	25	0	0	0	50
w2c4i2	0	0	0	0	0	0	0	-
w3c4i2	0	0	0	0	0	0	0	-
w1c1i3	0	0	0	0	0	0	0	-
w2c1i3	0	0	0	0	0	0	0	-
w3c1i3	75	0	0	0	25	0	0	125
w1c2i3	0	0	0	0	0	0	0	-
w2c2i3	0	0	0	0	25	0	0	25
w3c2i3	75	0	0	0	0	0	0	75
w1c3i3	0	0	0	0	0	0	0	-
w2c3i3	0	0	0	0	0	0	0	-
w3c3i3	75	0	0	0	25	0	0	125
w1c4i3	37.5	0	0	0	12.5	0	0	50
w2c4i3	75	0	0	0	0	0	0	75
w3c4i3	0	0	0	0	25	0	0	25

014040021	1	2	3	4	5	6	7
<u>lamda</u>	0.5	0	0	0	0.5	0	0
Cost	900	1160	1250	1350	1050	1150	1000
<u>Seta</u>	0.5	0	0	0.5	0	0	0
Cost	800	1070	945	900	950	900	950
<u>Beta</u>	0.75	0	0	0	0.25	0	0
Cost	1650	1970	2035	2150	1950	1950	1950
Obj1	450	0	0	0	525	0	0
Obj2	400	0	0	450	0	0	0
Obj3	1237.5	0	0	0	487.5	0	0
Total Obj	2087.5	2087.5	2087.5	2537.5	3550	3550	3550

Lamda	0.5	0.5	0.5	0.5	1	1	1
Seta	0.5	0.5	0.5	1	1	1	1
Beta	0.75	0.75	0.75	0.75	1	1	1

	1	2	3	4	5	6	စုစုပေါင်း (7)
w1c1ဘဏ်	50	50	50	100	125	125	125
w2c1ဘဏ်	25	25	25	50	50	50	50
w3c1ဘဏ်	100	100	100	100	125	125	125
w1c2ဘဏ်	50	50	50	50	75	75	75
w2c2ဘဏ်	0	0	0	0	50	50	50
w3c2ဘဏ်	100	100	100	125	125	125	125
w1c3ဘဏ်	50	50	50	100	100	100	100
w2c3ဘဏ်	75	75	75	75	125	125	125
w3c3ဘဏ်	75	75	75	75	125	125	125
w1c4ဘဏ်	62.5	62.5	62.5	87.5	100	100	100
w2c4ဘဏ်	100	100	100	100	125	125	125
w3c4ဘဏ်	0	0	0	0	25	25	25
ဘဏ်	687.5	687.5	687.5	862.5	1150	1150	1150

Microsoft Excel 11.0 Sensitivity Report

Worksheet: [HW10 (Danzig-Wolfe)6.xls]ต๑๑

Report Created: 31/8/2548 23:15:05

Adjustable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
\$B\$2	lamda	0.5	0	900	0	50
\$C\$2	lamda	0	120	1160	1E+30	120
\$D\$2	lamda	0	49.99999998	1250	1E+30	49.99999998
\$E\$2	lamda	8.0289E-12	0	1350	0	100
\$F\$2	lamda	0.5	0	1050	33.33333333	0
\$B\$4	Seta	0.5	0	800	100	0
\$C\$4	Seta	0	280	1070	1E+30	280
\$D\$4	Seta	0	140	945	1E+30	140
\$E\$4	Seta	0.5	0	900	0	100
\$F\$4	Seta	0	50	950	1E+30	50
\$B\$6	Beta	0.75	0	1650	300	44.4481075
\$C\$6	Beta	0	155	1970	1E+30	155
\$D\$6	Beta	0	185	2035	1E+30	185
\$E\$6	Beta	0	0	2150	1E+30	0
\$F\$6	Beta	0.25	0	1950	0	300

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
\$F\$14	Seta	1	900	1	0	0.333333333
\$F\$15	Beta	1	2150	1	0	0.166666667
\$F\$13	Lamda	1	1500	1	0.166666667	0
\$F\$53	w1c1	125	0	125	1E+30	0
\$F\$54	w2c1	50	0	125	1E+30	75
\$F\$55	w3c1	125	-2	125	16.66666667	0
\$F\$56	w1c2	75	0	125	1E+30	50
\$F\$57	w2c2	50	0	125	1E+30	75
\$F\$58	w3c2	125	0	125	16.66666667	0
\$F\$59	w1c3	100	0	125	1E+30	25
\$F\$60	w2c3	125	-3	125	0	25
\$F\$61	w3c3	125	0	125	1E+30	0
\$F\$62	w1c4	100	0	125	1E+30	25
\$F\$63	w2c4	125	-3	125	0	16.66666667
\$F\$64	w3c4	25	0	125	1E+30	100

Adjustable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
\$B\$2	lamda	0.5	0	900	50	0
\$C\$2	lamda	0	160	1160	1E+30	160
\$D\$2	lamda	0	100	1250	1E+30	100
\$E\$2	lamda	0	99.99999996	1350	1E+30	99.99999996
\$F\$2	lamda	0.5	0	1050	0	25
\$G\$2	lamda	3.18576E-11	0	1150	49.99999998	0
\$B\$4	Seta	0.5	0	800	99.99999995	0
\$C\$4	Seta	0	220.0000001	1070	1E+30	220.0000001
\$D\$4	Seta	0	110	945	1E+30	110
\$E\$4	Seta	0	0	900	1E+30	0
\$F\$4	Seta	0	0	950	1E+30	0
\$G\$4	Seta	0.5	0	900	0	99.99999996
\$B\$6	Beta	0.75	0	1650	0	400
\$C\$6	Beta	0	130	1970	1E+30	130
\$D\$6	Beta	0	145	2035	1E+30	145
\$E\$6	Beta	-4.60403E-12	0	2150	0	0
\$F\$6	Beta	0	0	1950	1E+30	0
\$G\$6	Beta	0.25	0	1950	0	199.9999999

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
\$G\$13	Lamda	1	1350	1	0.166666667	0
\$G\$14	Seta	1	950.0000001	1	0	0
\$G\$15	Beta	1	2250	1	0	0
\$G\$53	w1c1	125	0	125	0	16.32236925
\$G\$54	w2c1	50	0	125	1E+30	75
\$G\$55	w3c1	125	-3	125	0	0
\$G\$56	w1c2	75	0	125	1E+30	50
\$G\$57	w2c2	50	0	125	1E+30	75
\$G\$58	w3c2	125	-1	125	12.5	0
\$G\$59	w1c3	100	0	125	1E+30	25
\$G\$60	w2c3	125	-2	125	0	25
\$G\$61	w3c3	125	0	125	1E+30	0
\$G\$62	w1c4	100	0	125	1E+30	25
\$G\$63	w2c4	125	-2	125	0	12.5
\$G\$64	w3c4	25	0	125	1E+30	100

Adjustable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
\$B\$2	lamda	0.5	0	900	0	0
\$C\$2	lamda	0	160	1160	1E+30	160
\$D\$2	lamda	0	100	1250	1E+30	100
\$E\$2	lamda	0	100.00000001	1350	1E+30	100.00000001
\$F\$2	lamda	0.5	0	1050	0	0
\$G\$2	lamda	3.2091E-11	0	1150	0	0
\$H\$2	lamda	0	0	1000	1E+30	0
\$B\$4	Seta	0.5	0	800	150	0
\$C\$4	Seta	0	220	1070	1E+30	220
\$D\$4	Seta	0	110	945	1E+30	110
\$E\$4	Seta	0.5	0	900	0	150
\$F\$4	Seta	0	0	950	1E+30	0
\$G\$4	Seta	0	0	900	1E+30	0
\$H\$4	Seta	0	0	950	1E+30	0
\$B\$6	Beta	0.75	0	1650	0	400.00000001
\$C\$6	Beta	0	130	1970	1E+30	130
\$D\$6	Beta	0	145	2035	1E+30	145
\$E\$6	Beta	0	0	2150	1E+30	0
\$F\$6	Beta	0.25	0	1950	0	0
\$G\$6	Beta	0	0	1950	1E+30	0
\$H\$6	Beta	0	0	1950	1E+30	0

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
\$H\$15	Beta	1	2250	1	0	0.125
\$H\$13	Lamda	1	1350	1	0	0
\$H\$14	Seta	1	950	1	0	0.25
\$H\$53	w1c1	125	0	125	1E+30	0
\$H\$54	w2c1	50	0	125	1E+30	75
\$H\$55	w3c1	125	-3	125	12.5	0
\$H\$56	w1c2	75	0	125	1E+30	50
\$H\$57	w2c2	50	0	125	1E+30	75
\$H\$58	w3c2	125	-1	125	12.5	0
\$H\$59	w1c3	100	0	125	1E+30	25
\$H\$60	w2c3	125	-2	125	0	25
\$H\$61	w3c3	125	0	125	1E+30	0
\$H\$62	w1c4	100	0	125	1E+30	25
\$H\$63	w2c4	125	-2	125	0	12.5
\$H\$64	w3c4	25	0	125	1E+30	100

* Shadow Price

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Optimal Sol?

Item1

Check

2	w1c1i1	50
5	w2c1i1	0
4	w3c1i1	0
3	w1c2i1	0
4	w2c2i1	50
2	w3c2i1	50
4	w1c3i1	50
3	w2c3i1	100
4	w3c3i1	0
5	w1c4i1	0
2	w2c4i1	50
4	w3c4i1	0

Cost

1000

Shadow Price
0
0
-3
0
0
-1
0
-2
0
0
-2
0

new subproblem		Data	LHS	RHS
2	w1c1i1	50	100	100
5	w2c1i1	0	200	200
7	w3c1i1	0	50	50
3	w1c2i1	0	50	50
4	w2c2i1	50	100	100
3	w3c2i1	50	150	150
4	w1c3i1	50	50	50
5	w2c3i1	100		
4	w3c3i1	0		
5	w1c4i1	0		
4	w2c4i1	50		
4	w3c4i1	0		

Solver

1350

Run Solver and Copy Data to Sheet data

Item2

Check

4	w1c1i2	100
1	w2c1i2	50
3	w3c1i2	0
3	w1c2i2	50
2	w2c2i2	0
4	w3c2i2	0
2	w1c3i2	100
3	w2c3i2	0
4	w3c3i2	0
1	w1c4i2	2.56E-11
4	w2c4i2	0
3	w3c4i2	50

Cost

950

Shadow Price
0
0
-3
0
0
-1
0
-2
0
0
-2
0

new subproblem		Data	LHS	RHS
4	w1c1i2	100	250	250
1	w2c1i2	50	50	50
6	w3c1i2	0	50	50
3	w1c2i2	50	150	150
2	w2c2i2	0	50	50
5	w3c2i2	0	100	100
2	w1c3i2	100	50	50
5	w2c3i2	0		
4	w3c3i2	0		
1	w1c4i2	2.56E-11		
6	w2c4i2	0		
3	w3c4i2	50		

Solver

950

Run Solver and Copy Data to Sheet data

Item3

Check

7	w1c1i3	0
4	w2c1i3	0
2	w3c1i3	100
6	w1c2i3	0
4	w2c2i3	100
4	w3c2i3	0
8	w1c3i3	0
3	w2c3i3	0
5	w3c3i3	100
5	w1c4i3	50
3	w2c4i3	0
6	w3c4i3	100

Cost

1950

Shadow Price

0
0
-3
0
0
-1
0
-2
0
0
-2
0

new subproblem		Data	LHS	RHS
7	w1c1i3	0	50	50
4	w2c1i3	0	100	100
5	w3c1i3	100	300	300
6	w1c2i3	0	100	100
4	w2c2i3	100	100	100
5	w3c2i3	0	100	100
8	w1c3i3	0	150	150
5	w2c3i3	0		
5	w3c3i3	100		
5	w1c4i3	50		
5	w2c4i3	0		
6	w3c4i3	100		

Solver

2250

Run Solver and Copy Data to Sheet data

ข้อมูล Value ในการ Run Item ทั้ง 3 ในแต่ละรอบ

w1c1i1	50	15	25	0	50	50	50
w2c1i1		15	25	50	0	0	0
w3c1i1		20		0	0	0	0
w1c2i1	50	45	25	0	50	0	0
w2c2i1		45	75	100	50	100	50
w3c2i1	50	10		0	0	0	50
w1c3i1		30	25	100	0	50	50
w2c3i1	150	110	75	0	100	50	100
w3c3i1		10	50	50	50	50	0
w1c4i1		10	25	0	0	0	0
w2c4i1	50	30	25	50	50	50	50
w3c4i1		10		0	0	0	0
w1c1i2	50	130	100	100	100	100	100
w2c1i2	50	10	25	50	50	50	50
w3c1i2	50	10	25	0	0	0	0
w1c2i2	50	30	30	0	50	0	50
w2c2i2		10	10	0	0	0	0
w3c2i2		10	10	50	0	50	0
w1c3i2	100	60	70	100	100	100	100
w2c3i2		20	15	0	0	0	0
w3c3i2		20	15	0	0	0	0
w1c4i2	50	30	50	50	0	50	0
w2c4i2		10		0	0	0	0
w3c4i2		10		0	50	0	50
w1c1i3		10	20	0	0	0	0
w2c1i3		20	20	100	0	0	0
w3c1i3	100	70	60	0	100	100	100
w1c2i3		15	20	0	0	0	0
w2c2i3		15	20	0	100	100	100
w3c2i3	100	70	60	100	0	0	0
w1c3i3		10	5	0	0	0	0
w2c3i3		30	25	0	0	0	0
w3c3i3	100	60	70	100	100	100	100
w1c4i3	50	15	5	50	50	50	50
w2c4i3	100	35	35	0	0	0	0
w3c4i3		100	110	100	100	100	100

