

PRIMAL LINEAR PROGRAMMING PROBLEM - MATH 465 11/12/2007

MAX $5X_1 + 8X_2$

S.T.

- 1) $1X_1 + 2X_2 < 5$
- 2) $3X_1 + 4X_2 < 12$

OPTIMAL SOLUTION

Objective Function Value = 22.000

Variable	Value	Reduced Costs
X1	2.000	0.000
X2	1.500	0.000

Constraint	Slack/Surplus	Dual Prices
1	0.000	2.000
2	0.000	1.000

By how much must the objective function coefficients increase before that variable's value would be positive in the optimal solution

The increase in the value of the optimal solution per unit increase in the constraint

The range of values over which the current solution will remain optimal if changes are made to one coefficient at a time.

OBJECTIVE COEFFICIENT RANGES

Variable	Lower Limit	Current Value	Upper Limit
X1	4.000	5.000	6.000
X2	6.667	8.000	10.000

RIGHT HAND SIDE RANGES

Constraint	Lower Limit	Current Value	Upper Limit
1	4.000	5.000	6.000
2	10.000	12.000	15.000

The range of values within which the dual prices are applicable and within which the same constraints are binding. (Range of Feasibility)

DUAL LINEAR PROGRAMMING PROBLEM

MIN $5X_1 + 12X_2$

S.T.

- 1) $1X_1 + 3X_2 > 5$
- 2) $2X_1 + 4X_2 > 8$

OPTIMAL SOLUTION

Objective Function Value = 22.000

Variable	Value	Reduced Costs
X1	2.000	0.000
X2	1.000	0.000

Constraint	Slack/Surplus	Dual Prices
1	0.000	-2.000
2	0.000	-1.500

OBJECTIVE COEFFICIENT RANGES

Variable	Lower Limit	Current Value	Upper Limit
X1	4.000	5.000	6.000
X2	10.000	12.000	15.000

RIGHT HAND SIDE RANGES

Constraint	Lower Limit	Current Value	Upper Limit
1	4.000	5.000	6.000
2	6.667	8.000	10.000