Windor Glass Company Example

(BY hand the first week of the course)

Original or Primal Model:

```
! Wyndor Glass Co. Problem.  LINGO model;
! X1 = batches of product 1 per week;
! X2 = batches of product 2 per week;
! Profit, in 1000 of dollars;

[Profit]   MAX =  3*X1 + 5*X2;

! Production time;
[Plant1]   X1         <=  4;
[Plant2]         2*X2 <= 12;
[Plant3] 3*X1  + 2*X2 <= 18;
```

```
  Global optimal solution found.
  Objective value:                              36.00000
  Model Class:                                        LP

  Total variables:                     2
  Total constraints:                   4
  Nonlinear constraints:               0

                              Variable           Value        Reduced Cost
                                    X1        2.000000            0.000000
                                    X2        6.000000            0.000000

                                   Row    Slack or Surplus      Dual Price
                                PROFIT        36.00000            1.000000
                                PLANT1        2.000000            0.000000
                                PLANT2        0.000000            1.500000
                                PLANT3        0.000000            1.000000

Ranges in which the basis is unchanged:

                                    Objective Coefficient Ranges:

                                      Current        Allowable        Allowable
                        Variable     Coefficient         Increase         Decrease
                              X1        3.000000         4.500000         3.000000
                              X2        5.000000         INFINITY         3.000000

                                    Righthand Side Ranges:

                                      Current        Allowable        Allowable
                                Row       RHS         Increase         Decrease
                              PLANT1  4.000000         INFINITY         2.000000
                              PLANT2  12.00000         6.000000         6.000000
                              PLANT3  18.00000         6.000000         6.000000
```

Dual Model

```
MODEL:
  MIN= 4 * PLANT1 + 12 * PLANT2 + 18 * PLANT3;
 [X1] PLANT1 + 3 * PLANT3 >= 3;
 [X2] 2 * PLANT2 + 2 * PLANT3 >= 5;
 END
```

```
Global optimal solution found.
  Objective value:                              36.00000

  Model Class:                                     LP

  Total variables:                    3
  Total constraints:                  3
  Nonlinear constraints:              0
```

Variable	Value	Reduced Cost
PLANT1	0.000000	2.000000
PLANT2	1.500000	0.000000
PLANT3	1.000000	0.000000

Row	Slack or Surplus	Dual Price
1	36.00000	-1.000000
X1	0.000000	-2.000000
X2	0.000000	-6.000000

Ranges in which the basis is unchanged:

Objective Coefficient Ranges:

Variable	Current Coefficient	Allowable Increase	Allowable Decrease
PLANT1	4.000000	INFINITY	2.000000
PLANT2	12.00000	6.000000	6.000000
PLANT3	18.00000	6.000000	6.000000

Righthand Side Ranges:

Row	Current RHS	Allowable Increase	Allowable Decrease
X1	3.000000	4.500000	3.000000
X2	5.000000	INFINITY	3.000000

NOTICE HOW THE RANGES OF OPTIMALITY OF THE DUAL VARIABLES, ARE THE RANGES OF FEASIBILITY FOR THE PRIMAL CONSTRAINTS.