

QuantModelling: Assignment

#Title - Linear Programming with R #Name - Surbhi Khandelwal

For This Problem: Objective function min: $+22 A1 + 14 A2 + 30 A3 + 600 A1 + 600 A2 + 600 A3 + 16 B1 + 20 B2 + 24 B3 + 625 B1 + 625 B2 + 625 B3$;

(Cost of Shipping per product + cost of production for each product)

Constraints: W1Demand: $+A1 + B1 = 80$; W2Demand: $+A2 + B2 = 60$; W3Demand: $+A3 + B3 = 70$;
ASupply: $+A1 + A2 + A3 \leq 100$; BSupply: $+B1 + B2 + B3 \leq 120$;

Where: A1 - Production at Plant A and being shipped to Warehouse 1 A2 - Production at Plant A and being shipped to Warehouse 2 A3 - Production at Plant A and being shipped to Warehouse 3 B1 - Production at Plant B and being shipped to Warehouse 1 B2 - Production at Plant B and being shipped to Warehouse 2 B3 - Production at Plant B and being shipped to Warehouse 3

```
library(lpSolve)
library(lpSolveAPI)
#install.packages('tinytex')
#tinytex::install_tinytex()
y <- read.lp("Ass6.lp")
y
```

Model name:

	A1	A2	A3	B1	B2	B3		
Minimize	622	614	630	641	645	649		
W1Demand	1	0	0	1	0	0	=	80
W2Demand	0	1	0	0	1	0	=	60
W3Demand	0	0	1	0	0	1	=	70
ASupply	1	1	1	0	0	0	<=	100
BSupply	0	0	0	1	1	1	<=	120
Kind	Std	Std	Std	Std	Std	Std		
Type	Real	Real	Real	Real	Real	Real		
Upper	Inf	Inf	Inf	Inf	Inf	Inf		
Lower	0	0	0	0	0	0		

Solving the problem to get objective function and do sensitivity and dual analysis.

```
solve(y)
```

```
## [1] 0
```

```
get.objective(y)
```

```
## [1] 132790
```

```
get.variables(y)
```

```
## [1] 0 60 40 80 0 30
```

```
get.constraints(y)
```

```
## [1] 80 60 70 100 110
```

```
get.sensitivity.objex(y)
```

```
## $objfrom
## [1] 6.220000e+02 -1.000000e+30 6.180000e+02 -8.756744e+16 6.330000e+02
## [6] 6.490000e+02
##
## $objtill
## [1] 1.00e+30 6.26e+02 6.30e+02 6.41e+02 1.00e+30 6.61e+02
##
## $objfromvalue
## [1] 4e+01 -1e+30 -1e+30 -1e+30 3e+01 -1e+30
##
## $objtillvalue
## [1] NA NA NA NA NA NA
```

```
get.sensitivity.rhs(y)
```

```
## $duals
## [1] 641 633 649 -19 0 0 0 0 0 12 0
##
## $dualsfrom
## [1] 0e+00 3e+01 4e+01 9e+01 -1e+30 -3e+01 -1e+30 -1e+30 -1e+30 -4e+01
## [11] -1e+30
##
## $dualstill
## [1] 9.0e+01 7.0e+01 8.0e+01 1.3e+02 1.0e+30 4.0e+01 1.0e+30 1.0e+30 1.0e+30
## [10] 3.0e+01 1.0e+30
```