

()

(// : // :)

()

()

" " ()
" " " "

(1953) King (1954) Heady

MGA

MGA

(Chang et al., 1982;

Harrington & Gidley, 1985)

(1987) Burton et al.

Adularia &

Rubenstein-Montano & Zandi (1998) Ajibefun

Hung (2000) Rubenstein-Montano et al. (1999)

(2005) et al.

()

MGA

:

()

Maximize $z = \sum_{j=1}^n c_j x_j$ ()

Subject to:

$$\sum_{j=1}^m a_{ij} x_j \leq b_i \quad \text{for } i = 1, 2, \dots, m$$

$$x_j \geq 0$$

$$\begin{matrix} c_j & & z \\ a_{ij} & & x_j \\ & & b_i \end{matrix}$$

(Russell & Thaler, 1985)

" "

()

(Jeffrey et al., 1992)

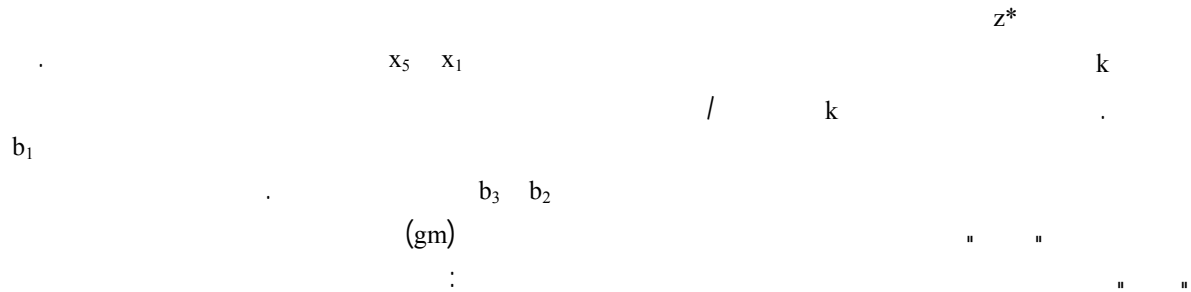
$$\text{Minimize } \sum_{j=1}^n x_j \quad (\text{for non-zero } x_s)$$

Subject to: (

$$\sum_{j=1}^n c_j x_j \geq (1-k)z^*$$

$$\sum_{i=1}^m a_{ij} x_j \leq b_i \quad \text{for } i = 1, 2, \dots, m$$

$$x_j \geq 0$$



$$\text{Maximize } z_1 = gm_1 * x_1 + gm_2 * x_2 + gm_3 * x_3 + gm_4 * x_4 + gm_5 * x_5$$

s.t.:

$$b_{11} * x_1 + b_{12} * x_2 + b_{13} * x_3 + b_{14} * x_4 + b_{15} * x_5 \leq b_1$$

$$b_{21} * x_1 + b_{22} * x_2 + b_{23} * x_3 + b_{24} * x_4 + b_{25} * x_5 \leq b_2$$

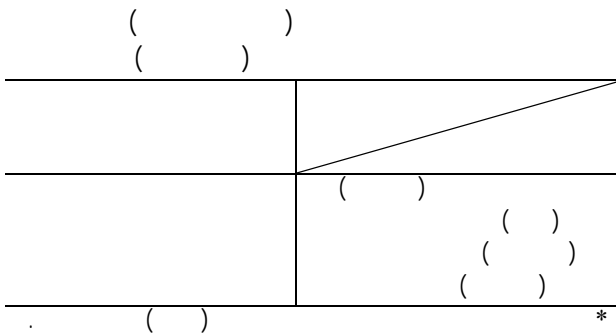
$$b_{31} * x_1 + b_{32} * x_2 + b_{33} * x_3 + b_{34} * x_4 + b_{35} * x_5 \leq b_3$$

$$x_1, x_2, x_3, x_4 \text{ and } x_5 \geq 0$$

gm

b_{ij}

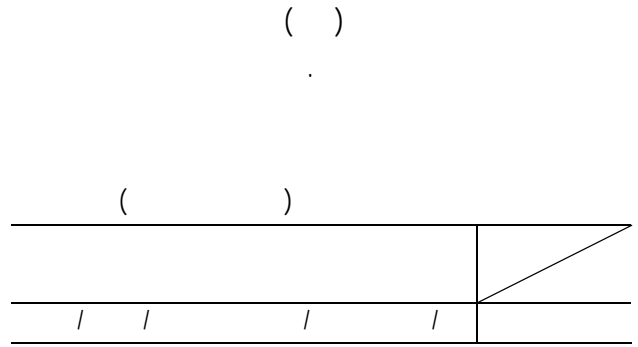
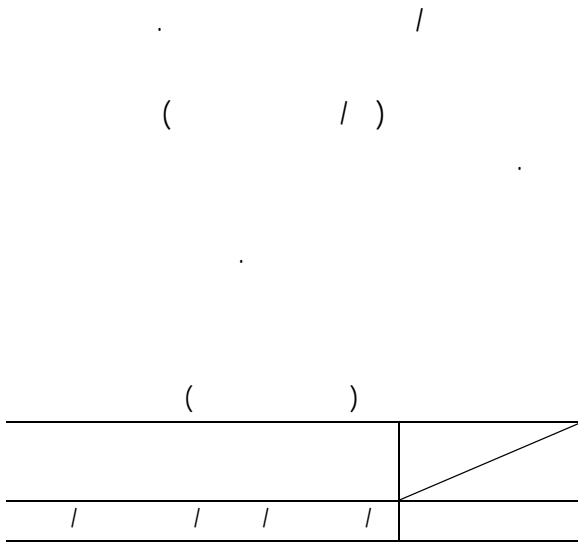
(non-zero variables)



$b_3 \quad b_2 \quad b_1$

$$\sum_{j=1}^n c_j x_j \leq (1+k)z^* \quad ($$

1. Gross margin (gm)



MGA

()

()

Minimize $z_2 = x_1 + x_3 + x_5$

s.t.:

$gm_1 * x_1 + gm_2 * x_2 + gm_3 * x_3 + gm_4 * x_4 + gm_5 * x_5 \geq 0.95 * Maxz_1$

$b_{11} * x_1 + b_{12} * x_2 + b_{13} * x_3 + b_{14} * x_4 + b_{15} * x_5 \leq b_1$

$b_{21} * x_1 + b_{22} * x_2 + b_{23} * x_3 + b_{24} * x_4 + b_{25} * x_5 \leq b_2$

$b_{31} * x_1 + b_{32} * x_2 + b_{33} * x_3 + b_{34} * x_4 + b_{35} * x_5 \leq b_3$

x_1, x_2, x_3, x_4 and $x_5 \geq 0$

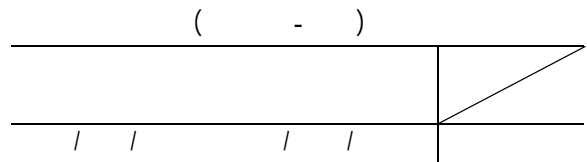
Maxz₁

()

)

" "

(



()

/

:

()

					/
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	
/	/	/	/	/	

*

" "

)

(

()

REFERENCES

1. Adularia, A. O. & Ajibefun, I. A. (1998). Developing alternative farm plans for cropping system decision making. *Agricultural Systems*, 56, 431-442.
2. Burton, R.O., jr., Gidley, J. S., Baker, B. S. & RedaWilson, K. J. (1987). Nearly optimal linear programming solutions: Someconceptual issues & a farm management application. *American Journal of Agricultural Economics*, 69, 813-818.
3. Chang, S. E. D., Brill, jr. & Hopkins, L. D. (1982). Use of mathematical models to generate alternative solutions to water resource planning programs. *Water Resource Research*, 18, 58-64.
4. Harrington, J. J. & Gidley, J. S. (1985). The variability of alternative decisions in a water resource planning problem. *Water Resource Research*, 21, 1831-1840.
5. Heady, E. O. (1954). Simplified presentation & logical aspects of linear programming technique. *Journal of Farm Economics*, 36, 1035-1050.
6. Huang, G. H., Linton, J. D., Yeomans, J. S. & Yoogalingam, R. (2005). Policy planning under uncertainty: Efficient starting populations for simulation-optimization methods applied to municipal solid waste management. *Journal of Environmental Management*, 77, 22-34.
7. King, R. A. (1953). Some applications of activity analysis in agricultural economics. *Journal of Farm Economics vol*, 25, 823-833.
8. Jeffrey, S. R., Gibson, R. R. & Faminow, M. D. (1992). Nearly optimal linear programming as a guide to agricultural planning. *Agricultural Economics*, 8, 1-19.

9. Rubenstein-Montano, B. & Zandi, I. (1999). Application of a genetic algorithm to policy planning: The case of solid waste. *Environment & Planning. Planning & Design*, 26, 893–907.
10. Rubenstein-Montano, B., Anandalingam, G. & Zandi, I. (2000). A genetic algorithm approach to policy design for consequence minimization. *European Journal of Operational Research*, 124, 43–54.
11. Russell, T. & Thaler, R. (1985). The relevance of quasi rationality in competitive markets. *American Economic Review*, 75, 1071-1082.
12. Soltani, Gh., Zibaei, M. & Kahkha, A. A. (1999). *Applications of mathematical programming in agriculture*. T.A.T organization. Tehran. 419p.