

Math Problem Set 4

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Problem 8.1. Jupyter notebook

Problem 8.2. Jupyter Notebook

Problem 8.3. Let x_1 denote the number of Barb soldiers sold and x_2 the number of Joey dolls. The optimization problem then is:

$$\begin{aligned} \min_{x_1, x_2} & -(4x_1 + 3x_2) \\ \text{subject to} & 2x_1 + 2x_2 \leq 300 \\ & 15x_1 + 10x_2 \leq 1800 \\ & x_2 \leq 200x_1, x_2 \geq 0 \end{aligned}$$

Problem 8.4. Let x_{ij} be the units that flow between node i and j. The optimization problem is:

$$\begin{aligned} \min_{x_{ij}, i \neq j} & 2x_{AB} + 5x_{AD} + 4x_{DE} + 3x_{EF} + 2x_{CF} + 5x_{BC} + 2x_{BD} + 7x_{BE} + 9x_{BF} \\ \text{subject to} & x_{AB} + x_{AD} = 10 \\ & x_{BD} + x_{BE} + x_{BF} + x_{BC} - x_{AB} = 1 \\ & x_{CF} - x_{BC} = -2 \\ & -(x_{EF} + x_{BF} + x_{CF}) = -10 \\ & x_{EF} - (x_{DE} + x_{BE}) = 4 \\ & x_{DE} - (x_{AD} + x_{BD}) = -3 \\ & 0 \leq x_{ij} \leq 6 \end{aligned}$$

Problem 8.4.