MATH 460 – Session 19

A Model for Mr. Wheeler's Problem:

Assume c_{ij}, d_j, and s_i are nonnegative constants and $s_1 + s_2 - d_1 - d_2 - d_3 = 0$ for $1 \leq i \leq 2$; $1 \leq j \leq 3$.

Minimize $C = c_{11}x_{11} + c_{12}x_{12} + c_{13}x_{13} + c_{21}x_{21} + c_{22}x_{22} + c_{23}x_{23}$
st

$$
\begin{array}{llllllll}
x_{11} & & & + x_{21} & & & \geq d_1 \\
& x_{12} & & & + x_{22} & & \geq d_2 \\
& & x_{13} & & & + x_{23} & \geq d_3 \\
x_{11} + & x_{12} + & x_{13} & & & & \leq s_1 \\
& & & x_{21} + & x_{22} + & x_{23} & \leq s_2
\end{array}
$$

and

$$x_{ij} \geq 0 \text{ for } 1 \leq i \leq 2;\ 1 \leq j \leq 3$$

Show that under our assumptions our structural constrains can be equivalently written as a system of four equations in six unknowns.

Transshipment Problem (Section 7.3)