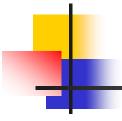# Mathematical Programming: Modelling and Applications

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Dyeing problem

A fabric dyeing plant has 3 dyeing baths. Each batch of fabric must be dyed in each bath in the order: first, second, third bath.

The plant must color five batches of fabric of different sizes.

For each batch, the time for dyeing in each bath is known.

Write a mathematical program for scheduling the dyeing operations in the baths so that the ending time of the last batch is minimized.

Solve the problem with AMPL.

Dyeing problem: data

3 dyeing baths

5 batches

Time (hours) for dyeing each batch in each bath:

$$\begin{pmatrix} 3 & 1 & 1 \\ 2 & 1.5 & 1 \\ 3 & 1.2 & 1.3 \\ 2 & 2 & 2 \\ 2.1 & 2 & 3 \end{pmatrix}$$

The element (i,k) is the time for dyeing batch i in bath k.