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D11: Optimization.

Exercise 3:

Let $\delta_i \in \{0, 1\}$, denoting whether product i is fabricated.
and x_i the production of i

Let $C_i = b_i \delta_i - d_i x_i$ where $b_i = \text{starting cost of } i$
 $d_i = \text{Revenue/unit of } i$

The problem can be modeled as:

$$\text{Min } \sum_{i=1}^4 C_i = \text{Min } \sum_{i=1}^4 b_i \delta_i - d_i x_i$$

$$\text{s.t. } \sum_{i=1}^4 \delta_i \leq 2$$

$$x_4 + x_3 \leq x_1 + x_2$$

$$a_i x_i \leq \delta_i \Pi_i$$

where $\Pi_i = \text{limit production cost of } i$
 $a_i = \text{production cost of } i$