

Transporting mineral water

Difficulty level: intermediate

Keywords

- Transportation
- Linear Programming
- Excel Solver

Problem description

A mineral water industry has three factories (located in Viterbo, Castelforte, and Bagnoregio) and three bottling plants (located in Naples, Rome, and Frosinone). The industry needs to transport mineral water from the factories to the three bottling plants, which must be supplied daily with at least 150, 50, and 90 hectoliters of water respectively. In the three factories, every day 150, 50, and 90 hectoliters are available, respectively. Table 1 shows the cost (in €) to transport one hectolitre of mineral water from each factory to each bottling plant.

	Napoli	Roma	Frosinone
Viterbo	250	100	85
Castelforte	120	80	150
Bagnoregio	100	100	100

Table 1: Transportation costs (in €) of a hectolitre of mineral water from each factory to each bottling plant.

Determine the quantities of mineral water to be transported daily from each factory to each bottling plant, in order to minimize the overall transportation costs. Also, take into account that, for logistical reasons, at least half of the water addressed to the plant in Naples must come from Bagnoregio.

Tasks

1. Formulate the problem by applying Linear, Integer, or Mixed Integer Linear Programming.
2. Solve the problem by using Excel Solver.