"Good morning! Coffee?"

Difficulty level: intermediate

Keywords

- Transportation
- Linear Programming
- Simplex method
- Excel Solver

Problem description

A chain of bars signed a commercial contract with a roasting industry for the exclusive supply of coffee. The industry has the two roasting plants T_1 and T_2, with which it will have to supply the three bars B_1, B_2, and B_3 of the chain. Given the different distances between the plants and the bars, and the different means of transport used, transporting coffee from a plant to a bar has different costs (in €/kg), summarized in Table 1.

	B_1	B_2	B_3
T_1	0.4	0.3	0.2
T_2	0.2	0.3	0.5

Table 1: Costs (in €/kg) to transport coffee from the roasting plants T_1 and T_2 to the bars B_1, B_2, and B_3.

The roasting plants T_1 and T_2 can produce a maximum of 54 and 44 kg of coffee per day, respectively, whereas the three bars need 35, 30, and 33 kg of coffee each.

Tasks

1. Identify the variables, the constraints, and the objective function of the problem.
2. What are the quantities of coffee to be transported from each plant to each bar to minimize costs?