There's always room for dessert

Difficulty level: intermediate

Keywords

- Production
- Linear Programming
- Simplex method
- Excel Solver

Problem description

Kondor Ferrari is a confectionery company that produces three types of chocolate: white, milk and dark. Each kilogram of chocolate requires the quantities (in kg) of sugar, cocoa, milk and vanilla shown in Table 1.

Chocolate type	Sugar	Cocoa	Milk	Vanilla
White	0.2	0.2	0.4	0.2
Milk	0.2	0.3	0.5	0.0
Dark	0.1	0.7	0.2	0.0

Table 1: Ingredients (in kg) required to produce a kilogram of white, milk, and dark chocolate.

Every day the company can use a maximum of 70 kg of sugar, 40 kg of cocoa, 100 kg of milk, and 20 kg of vanilla. To meet the demand of all its customers, it is necessary that the company produces at least 10 kg of white chocolate, at least 30 kg of milk chocolate, and at least 35 kg of dark chocolate. The selling price of a kilogram of white chocolate is 30 €/kg, whereas milk chocolate and dark chocolate are sold for 20 €/kg and 40 €/kg, respectively.

Tasks

1. Identify the variables, the constraints, and the objective function of the problem.
2. What are the quantities of chocolate to be produced daily so that the profit of Kondor Ferrari is maximum?