

Ex 2 - modelling - morning

$x_i \geq 0 \quad i=1 \dots 3$ qt of product P_i

number of hours available in a week in each workshop:
(number of workers \times 40)

	w1	w2	w3
h/w	320	320	360

BASE Model

$$\max \quad 500x_1 + 800x_2 + 1200x_3 = \sum_{i=1}^3 p_i x_i$$

$p_i \equiv$ profit of 1 unit of product P_i

$$3x_1 + 4x_2 + 4x_3 \leq 320 \quad \text{limit of hours in w1}$$

$$4x_1 + 3x_2 + 4x_3 \leq 320 \quad \text{limit of hours in w2}$$

$$2x_1 + 3x_2 + 4x_3 \leq 360 \quad \text{limit of hours in w3}$$

$$0 \leq x_i \leq 800 \quad i=1 \dots 3$$

We introduce binary variables:

$y_i \in \{0, 1\} \quad i=1 \dots 3 \quad y_i = 1$ there is production of product P_i

coherence constraint:

$$x_i \leq 800 y_i \quad i=1 \dots 3$$

$x_i \geq 20 y_i \quad i=1 \dots 3$ at least 20 units if there is production

$$y_1 + y_2 + y_3 \leq 2$$

at most 2 types of products.

also $x_i \leq M y_i \quad i=1 \dots 3$
 M large enough is correct, but half points if M is not chosen