Problem 1:

A company makes three models of desks, an executive model, an office model and a student model. Each desk spends time in the cabinet shop, the finishing shop and the crating shop as shown in the table:

Type of desk	Cabinet shop (in hrs.)	Finishing shop (in hrs.)	Crating shop (in hrs.)	Profit (in Rs.)
Executive	2	2	1	1600
Office	1.5	1	2	1300
Student	1	1.5	.5	600
Available hours	20	24	20	

How many of each type of model should be made to maximize profits?

Maximize $z = 1600x_1 + 1300x_2 + 600x_3$

Subject to $2x_1 + 1.5x_2 + x_3 \leq 20$

$2x_1 + x_2 + 1.5x_3 \leq 24$

$x_1 + 2x_2 + 0.5x_3 \leq 20$