1. The DC Drug Company produces two types of liquid pain killer, N (normal) and S (Super). Each bottle of N requires 2 units of drug A, 1 unit of drug B, and 1 unit of drug C. Each bottle of S requires 1 unit of A, 1 unit of B, and 3 units of C. The company is able to produce, each week, only 1400 units of A, 800 units of B, and 1800 units of C. The profit per bottle of N and S $11 is and $15, respectively. Maximize the total profit.

2. Foods A and B have 600 and 500 calories, contain 15 g and 30 g of protein, and cost $1.80 and $2.10 per unit, respectively. Find the minimum cost diet of at least 3900 calories containing at least 150 g of protein.

3. A factory produces two kinds of gaskets, G_1, G_2, with net profit of $60 and $30, respectively, Maximize the total daily profit subject to the constraints number (x_j of gaskets G_j produced per day):

$40x_1 + 40x_2 \leq 1800$ (Machine hours)

$200x_1 + 20x_2 \leq 6300$ (Labor)

A manufacturing company makes two circuit boards R1 and R2, constructed as follows:

R1 comprises 3 resistors, 1 capacitor, 2 transistors and 2 inductances;

R2 comprises 4 resistors, 2 capacitors and 3 transistors.

The available stocks for a day's production are 2400 resistors, 900 capacitors, 1600 transistors and 1200 inductances. It is required to calculate how many R1 and how many R2 the company should produce daily in order to maximize its overall profits, knowing that it can make a profit on an R1 circuit board of 5p and on an R2 circuit board of 9p. Formulate the mathematical model describing the linear programming (LP) problem which will maximize its overall profits using maximize & subject to constrains ?