

## **\*\* Basic Assumptions:**

1. Owner can sell all the soaps she has made in every month.
2. We ignore “10 soaps in stock” condition.
3. Ignore working hours constraints.
4. Ignore raw materials constraints, calculation based on the average statistics in the past.
5. Tax and packaging fees all included in the final OF(objective function).

### 1. Constraints:

- Number constraints:

$$\sum_{i=1}^6 x_i \leq 400 \text{ (max bar/month)}$$

- monthly output  $\geq$  market demand:

$$\frac{9}{10} x_1 \geq 20\% \sum_{i=1}^6 x_i$$

$$\frac{9}{10} x_2 \geq 20\% \sum_{i=1}^6 x_i$$

$$\frac{9}{10} x_3 \geq 15\% \sum_{i=1}^6 x_i$$

$$\frac{9}{10} x_4 \geq 10\% \sum_{i=1}^6 x_i$$

$$\frac{9}{10} x_5 \geq 10\% \sum_{i=1}^6 x_i$$

$$\frac{9}{10} x_6 \geq 15\% \sum_{i=1}^6 x_i$$

- integer constraint:

$$X_i \text{ is an integer } (i \in [1, 6])$$

## 2. Set slack vars, artificial vars and excess vars:

Slack vars:  $s_1$

Excess vars:  $e_1 \rightarrow e_6$

Artificial vars:  $a_1 \rightarrow a_6$

## Symbol projection:

$$(x_1 \rightarrow x_6) \Rightarrow (x_1 \rightarrow x_6)$$

$$x_7 \Rightarrow s_1$$

$$(x_8 \rightarrow x_{13}) \Rightarrow (e_1 \rightarrow e_6)$$

$$(x_{14} \rightarrow x_{19}) \Rightarrow (a_1 \rightarrow a_6)$$

### 3. Standard form:

$$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + s_1 = 400$$

$$7x_1 - 2x_2 - 2x_3 - 2x_4 - 2x_5 - 2x_6 - e_1 + a_1 = 0$$

$$-2x_1 + 7x_2 - 2x_3 - 2x_4 - 2x_5 - 2x_6 - e_2 + a_2 = 0$$

$$-x_1 - x_2 + 5x_3 - x_4 - x_5 - x_6 - e_3 + a_3 = 0$$

$$-x_1 - x_2 - x_3 + 8x_4 - x_5 - x_6 - e_4 + a_4 = 0$$

$$-x_1 - x_2 - x_3 - x_4 + 8x_5 - x_6 - e_5 + a_5 = 0$$

$$-x_1 - x_2 - x_3 - x_4 - x_5 + 5x_6 - e_6 + a_6 = 0$$

### 4. OF(objective function):

Unit: dollars

$$\text{Max } z = 7.05x_1 + 5.79x_2 + 6.38x_3 + 6.65x_4 + 7.05x_5 + 6.75x_6$$

$$\text{Min } w = -7.05x_1 - 5.79x_2 - 6.38x_3 - 6.65x_4 - 7.05x_5 - 6.75x_6$$

### 5. Simplex tableau (decimal form):

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	RMS
X1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	400.00
X14	-7.00	-2.00	-2.00	-2.00	-2.00	-2.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
X15	-2.00	-7.00	-2.00	-2.00	-2.00	-2.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00
X16	-1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
X17	-1.00	-1.00	-1.00	8.00	-1.00	-1.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
X18	-1.00	-1.00	-1.00	-1.00	8.00	-1.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
X19	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.00	0.00	0.00	0.00	0.00	-1.00	-1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
X20	-7.05	-5.79	-6.38	-6.65	-7.05	-6.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X21	-1.00	-1.00	2.00	-1.00	-1.00	2.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
X2	0.00	1.29	1.29	1.29	1.29	1.29	1.00	0.14	0.00	0.00	0.00	0.00	0.00	-0.14	0.00	0.00	0.00	0.00	0.00	400.00
X3	0.00	-0.29	-0.29	-0.29	-0.29	-0.29	0.00	-0.29	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
X4	0.00	6.43	-2.57	-2.57	-2.57	-2.57	0.00	-0.29	-1.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
X5	0.00	-1.29	4.71	-1.29	-1.29	-1.29	0.00	-0.14	0.00	-1.00	0.00	0.00	0.00	0.14	0.00	1.00	0.00	0.00	0.00	0.00
X6	0.00	-1.29	-1.29	7.71	-1.29	-1.29	0.00	-0.14	0.00	0.00	-1.00	0.00	0.00	0.14	0.00	0.00	1.00	0.00	0.00	0.00
X7	0.00	-1.29	-1.29	-1.29	7.71	-1.29	0.00	-0.14	0.00	0.00	-1.00	0.00	0.00	-0.14	0.00	0.00	0.00	1.00	0.00	0.00
X8	0.00	-1.29	-1.29	-1.29	-1.29	7.71	0.00	-0.14	0.00	0.00	0.00	0.00	-1.00	0.14	0.00	0.00	0.00	0.00	1.00	0.00
X9	0.00	-7.80	-8.39	-8.66	-9.06	-8.76	0.00	-1.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
X10	0.00	-1.29	1.71	-1.29	-1.29	1.71	0.00	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
X11	0.00	0.00	0.00	1.80	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.00	400.00
X12	0.00	1.00	0.00	-0.40	-0.40	-0.40	0.00	-0.16	-0.04	0.00	0.00	0.00	0.00	0.16	0.04	0.00	0.00	0.00	0.00	0.00
X13	0.00	1.00	0.00	-0.40	-0.40	-0.40	0.00	-0.04	-0.16	0.00	0.00	0.00	0.00	0.04	0.16	0.00	0.00	0.00	0.00	0.00
X14	0.00	1.00	0.00	-0.40	-0.40	-0.40	0.00	-0.04	-0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X15	0.00	0.00	1.80	1.80	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00
X16	0.00	0.00	1.80	2.20	-1.80	-1.80	0.00	-0.20	-0.20	0.00	0.00	0.00	0.00	0.20	0.20	0.00	1.00	0.00	0.00	0.00
X17	0.00	0.00	1.80	2.20	-1.80	-1.80	0.00	-0.20	-0.20	0.00	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00
X18	0.00	0.00	-1.80	-1.80	7.20	-1.80	0.00	-0.20	-0.20	0.00	0.00	-1.00	0.00	0.20	0.20	0.00	0.00	1.00	0.00	0.00
X19	0.00	0.00	-1.80	-1.80	-1.80	7.20	0.00	-0.20	-0.20	0.00	0.00	-1.00	0.00	0.20	0.20	0.00	0.00	0.00	1.00	0.00
X20	0.00	0.00	-11.79	-11.79	-11.79	-11.79	0.00	-1.15	-1.21	0.00	0.00	0.00	0.00	0.35	0.21	0.00	0.00	0.00	0.00	0.00
X21	0.00	0.00	1.20	-1.80	-1.80	1.20	0.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00	0.20	0.20	0.00	0.00	0.00	0.00
X2	0.00	0.00	2.25	0.00	2.25	2.25	1.00	0.25	0.25	0.00	0.25	0.00	0.00	-0.25	-0.25	0.00	-0.25	0.00	0.00	400.00
X3	0.00	0.00	-0.50	0.00	-0.50	-0.50	0.00	-0.17	-0.05	0.00	-0.06	0.00	0.00	0.17	0.06	0.00	0.06	0.00	0.00	0.00
X4	0.00	0.00	-0.50	0.00	-0.50	-0.50	0.00	-0.17	-0.06	0.00	-0.06	0.00	0.00	0.17	0.06	0.00	0.06	0.00	0.00	0.00
X5	0.00	0.00	3.75	0.00	-2.25	-2.25	0.00	-0.25	-0.25	-1.00	-0.25	0.00	0.00	0.25	0.25	1.00	0.25	0.00	0.00	0.00
X6	0.00	0.00	-0.25	1.00	-0.25	0.25	0.00	-0.03	-0.03	0.00	-0.14	0.00	0.00	0.03	0.03	0.01	0.14	0.00	0.00	0.00
X7	0.00	0.00	-2.25	0.00	6.75	-2.25	0.00	-0.25	-0.25	0.00	-0.25	-1.00	0.00	0.25	0.25	0.00	0.25	1.00	0.00	0.00
X8	0.00	0.00	-0.25	1.00	-0.25	0.25	0.00	-0.03	-0.03	0.00	-0.14	0.00	0.00	0.03	0.03	0.01	0.14	0.00	0.00	0.00
X9	0.00	0.00	-2.25	0.00	6.75	-2.25	0.00	-0.25	-0.25	0.00	-0.25	-1.00	0.00	0.25	0.25	0.00	0.25	1.00	0.00	0.00
X10	0.00	0.00	-0.25	1.00	-0.25	0.25	0.00	-0.03	-0.03	0.00	-0.14	0.00	0.00	0.03	0.03	0.01	0.14	0.00	0.00	0.00
X11	0.00	0.00	-14.46	0.00	-15.13	-14.83	0.00	-1.68	-1.54	0.00	-1.64	0.00	0.00	1.68	1.54	0.00	1.64	0.00	0.00	0.00
X12	0.00	0.00	0.75	0.00	-2.25	0.75	0.00	0.75	0.75	1.00	0.75	1.00	1.00	1.00	0.25	0.25	0.00	0.25	0.00	0.00
X13	0.00	0.00	3.00	0.00	0.00	3.00	1.00	0.33	0.33	0.00	0.33	0.33	0.00	-0.33	-0.33	0.00	-0.33	-0.33	0.00	400.00
X14	0.00	0.00	0.67	0.00	0.67	0.67	0.00	-0.07	-0.07	0.00	-0.07	-0.07	0.00	0.19	0.07	0.00	0.07	0.07	0.00	0.00
X15	0.00	0.00	-0.67	0.00	0.00	-0.67	0.00	-0.07	-0.19	0.00	-0.07	-0.07	0.00	0.07	0.19	0.00	0.07	0.07	0.00	0.00
X16	0.00	0.00	3.00	0.00	0.00	3.00	0.00	-0.33	-0.33	-1.00	-0.33	-0.33	0.00	0.33	0.33	1.00	0.33	0.33	0.00	0.00
X17	0.00	0.00	-0.33	1.00	-0.33	-0.33	0.00	-0.04	-0.04	0.00	-0.04	-0.04	0.00	0.04	0.04	0.00	0.15	0.04	0.00	0.00
X18	0.00	0.00	-0.33	1.00	-0.33	0.00	0.00	-0.04	-0.04	0.00	-0.04	-0.04	0.00	0.04	0.04	0.00	0.04	0.15	0.00	0.00
X19	0.00	0.00	-3.00	0.00	0.00	3.00	0.00	-0.33	-0.33	0.00	-0.33	-0.33	-1.00	0.33	0.33	0.00	0.33	0.33	1.00	0.00
X20	0.00	0.00	-19.51	0.00	0.00	-19.88	0.00	-2.24	-2.10	0.00	-2.20	-2.24	0.00	2.24	2.10	0.00	2.20	2.24	0.00	0.00
X21	0.00	0.00	0.67	0.00	0.00	0.67	0.00	0.67	0.67	0.00	0.67	0.67	0.00	-0.67	-0.67	0.00	-0.67	-0.67	0.00	0.00
X2	0.00	0.00	0.00	0.00	0.00	0.00	9.00	3.00	1.00	1.00	1.00	1.00	0.00	-1.00	-1.00	0.00	-1.00	-1.00	0.00	1200.00
X3	0.00	1.00	0.00	0.00	0.00	1.00	0.56	0.00	0.11	0.00	0.11	0.11	0.00	0.00	-0.11	0.00	-0.11	-0.11	0.00	222.22
X4	0.00	1.00	0.00	0.00	0.00	0.00	0.22	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	88.89
X5	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.89
X6	0.00	0.00	0.00	1.00	0.00	0.00	0.11	0.00	0.00	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	44.44
X7	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.11	0.00	0.00	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.11	0.00	44.44
X8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00
X16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00

## 6. simplex tableau(fraction form) :

Basis	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	RHS
X7	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	400
X14	7	-2	-2	-2	-2	-2	-2	0	-1	0	0	0	0	0	1	0	0	0	0	0
X15	-2	7	-2	-2	-2	-2	-2	0	0	-1	0	0	0	0	0	1	0	0	0	0
X16	-1	-1	5	-1	-1	-1	-1	0	0	0	-1	0	0	0	0	0	1	0	0	0
X17	-1	-1	-1	8	-1	-1	-1	0	0	0	0	-1	0	0	0	0	0	1	0	0
X18	-1	-1	-1	-1	8	-1	-1	0	0	0	0	0	-1	0	0	0	0	1	0	0
X19	-1	-1	-1	-1	-1	5	0	0	0	0	0	0	0	-1	0	0	0	0	1	0
	-141	-329	-318	-331	-341	-22	4	0	0	0	0	0	0	0	0	0	0	0	0	0
	-20	100	50	20	20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-1	-1	2	-1	-1	2	0	1	1	1	1	1	1	1	0	0	0	0	0	0
X7	0	2	2	2	2	2	1	2	0	0	0	0	0	0	-7	0	0	0	0	400
X1	1	-2	-2	-2	-2	-2	0	-2	0	0	0	0	0	0	2	0	0	0	0	0
X15	0	45	-18	-18	-18	-18	0	-2	-1	0	0	0	0	0	2	1	0	0	0	0
X16	0	-2	7	-2	-2	-2	0	-2	0	-1	0	0	0	0	2	0	1	0	0	0
X17	0	-2	-2	84	-2	-2	0	-2	0	0	-1	0	0	0	2	0	0	1	0	0
X18	0	-2	-2	7	-2	-2	0	-2	0	0	0	-1	0	0	2	0	0	1	0	0
X19	0	-2	-2	-2	-2	31	0	-2	0	0	0	0	0	-1	2	0	0	0	1	0
	5463	-1469	-1213	-1209	-1222	-141	0	0	0	0	0	0	0	141	140	0	0	0	0	0
	0	790	175	140	140	140	0	6	1	1	1	1	1	1	1	0	0	0	0	0
	0	-2	-2	-2	-2	12	0	2	1	1	1	1	1	1	1	0	0	0	0	0
X7	0	0	5	5	5	5	1	5	0	0	0	0	0	0	-5	-5	0	0	0	400
X1	1	0	-5	-5	-5	-5	0	-5	0	0	0	0	0	0	2	45	0	0	0	0
X2	0	1	-2	-2	-2	-2	0	-2	0	0	0	0	0	0	2	45	0	0	0	0
X16	0	0	21	5	-2	-2	0	-2	-1	-1	-1	0	0	0	2	1	1	0	0	0
X17	0	0	-2	36	-2	-2	0	-2	0	-1	0	-1	0	0	2	1	0	1	0	0
X18	0	0	-2	36	-2	-2	0	-2	0	-1	0	-1	0	0	2	1	0	1	0	0
X19	0	0	-2	-2	-2	21	0	-2	0	-1	0	0	0	-1	2	1	0	0	1	0
	0	0	-2879	-1893	-6093	-5943	0	-827	602	0	0	0	0	0	827	500	0	0	0	0
	0	0	5	5	5	5	0	5	5	1	1	1	1	1	5	5	0	0	0	0
X7	0	0	4	4	4	4	1	4	0	0	0	0	0	0	-4	-4	0	0	0	400
X1	1	0	-2	-2	-2	-2	0	-2	0	0	0	0	0	0	2	18	0	0	0	0
X2	0	1	-2	-2	-2	-2	0	-2	0	0	0	0	0	0	2	18	0	0	0	0
X16	0	0	35	4	-2	-2	0	-2	-1	-1	-1	0	0	0	2	1	1	0	0	0
X4	0	0	-1	1	-1	-1	0	-1	-1	0	-5	0	0	0	2	1	0	1	0	0
X18	0	0	-2	4	-2	-2	0	-2	0	-1	0	-1	0	0	2	1	0	1	0	0
X19	0	0	-2	4	-2	15	0	-2	0	-1	0	0	-1	0	2	1	0	1	0	0
	0	0	-1137	80	-6053	-400	0	-6053	5549	0	-1893	6053	0	0	6053	5549	0	5893	6053	0
	0	0	4	4	4	4	0	4	4	1	1	1	1	1	4	4	0	1	0	0
X7	0	0	3	0	0	3	1	3	0	0	0	0	0	0	-3	-3	0	-3	0	400
X1	1	0	-2	0	0	-2	0	-2	0	0	0	0	0	0	2	27	0	2	0	0
X2	0	1	-2	0	0	-2	0	-2	0	0	0	0	0	0	2	27	0	2	0	0
X16	0	0	3	0	0	-3	0	-3	-1	-1	-1	0	0	0	2	1	1	1	0	0
X4	0	0	-1	1	0	-1	0	-1	-1	0	-4	0	0	0	2	1	0	1	0	0
X5	0	0	-1	1	0	-1	0	-1	-1	0	-4	0	0	0	2	1	0	1	0	0
X19	0	0	-3	0	0	3	0	-3	0	0	-1	0	-1	0	2	1	0	1	1	0
	0	0	-1463	75	0	0	-5963	-6053	227	0	-1933	6053	0	0	6053	227	0	5933	6053	0
	0	0	0	0	0	0	0	0	2	108	0	-2790	6053	0	6053	108	0	2790	6053	0
	0	0	0	0	0	0	0	0	1	2	1	2	1	1	1	1	0	1	1	0
X8	0	0	9	0	0	9	3	1	1	0	1	1	0	0	-1	-1	0	-1	-1	1200
X1	1	0	1	0	0	1	3	0	1	0	1	1	0	0	0	-1	0	-1	-1	200
X2	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	800
X16	0	0	6	0	0	0	1	0	0	-1	0	0	0	0	0	0	1	0	0	400
X4	0	0	0	1	0	0	1	0	0	0	-1	0	0	0	0	0	0	1	0	400
X5	0	0	0	0	1	0	1	0	0	0	0	-1	0	0	0	0	0	1	0	400
X19	0	0	0	0	0	6	1	0	0	0	0	0	0	-1	0	0	0	0	1	400
	0	0	67	0	0	1	6053	0	2	0	2	0	0	0	0	-2	0	-2	0	24212
	0	0	100	0	0	10	900	0	50	0	45	0	0	0	0	-50	0	-45	0	9
	0	0	-6	0	0	-6	-2	0	0	1	0	0	0	1	1	1	0	1	1	-800
X8	0	0	9	0	0	0	2	1	1	0	1	1	2	0	-1	-1	0	-1	-1	600
X1	1	0	1	0	0	0	18	0	1	0	1	1	2	0	0	-9	0	-9	-1	1400
X2	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	800
X16	0	0	6	0	0	0	1	0	0	-1	0	0	0	0	0	0	1	0	0	400
X4	0	0	0	1	0	0	1	0	0	0	-1	0	0	0	0	0	0	1	0	400
X5	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	400
X6	0	0	0	0	0	1	8	0	0	0	0	0	0	-1	8	0	0	0	1	200
	0	0	67	0	0	0	1302	0	2	0	2	0	0	0	0	-2	0	-2	0	24032
	0	0	100	0	0	10	225	0	50	0	45	0	0	0	0	-50	0	-45	0	9
	0	0	-6	0	0	0	-1	0	0	1	0	0	0	0	1	1	0	1	1	-400
X8	0	0	0	0	0	0	0	1	1	2	1	1	2	0	-1	-1	-2	-1	-1	0
X1	1	0	0	0	0	0	2	0	1	2	1	1	2	0	0	-9	0	-9	-1	800
X2	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	800
X16	0	0	6	0	0	0	1	0	0	-1	0	0	0	0	0	0	1	0	0	400
X4	0	0	0	1	0	0	1	0	0	0	-1	0	0	0	0	0	0	1	0	400
X5	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	400
X6	0	0	0	0	0	1	8	0	0	0	0	0	0	-1	8	0	0	0	1	200
	0	0	67	0	0	0	1302	0	2	0	2	0	0	0	0	-2	0	-2	0	24032
	0	0	100	0	0	10	225	0	50	0	45	0	0	0	0	-50	0	-45	0	9
	0	0	-6	0	0	0	-1	0	0	1	0	0	0	0	1	1	0	1	1	-400
X8	0	0	0	0	0	0	0	1	1	2	1	1	2	0	-1	-1	-2	-1	-1	0
X1	1	0	0	0	0	0	2	0	1	2	1	1	2	0	0	-9	0	-9	-1	800
X2	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	800
X16	0	0	6	0	0	0	1	0	0	-1	0	0	0	0	0	0	1	0	0	400
X4	0	0	0	1	0	0	1	0	0	0	-1	0	0	0	0	0	0	1	0	400
X5	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	400
X6	0	0	0	0	0	1	8	0	0	0	0	0	0	-1	8	0	0	0	1	200
	0	0	67	0	0	0	1302	0	2	0	2	0	0	0	0	-2	0	-2	0	24032
	0	0	100	0	0	10	225	0	50	0	45	0	0	0	0	-50	0	-45	0	9
	0	0	-6	0	0	0	-1	0	0	1	0	0	0	0	1	1	0	1	1	-400

## 7. Conclusion :

The optimal solution is (according to the decimal tableau above):

$$X_1 = 88.89$$

$$X_2 = 88.89$$

$$X_3 = 66.67$$

$$X_4 = 44.44$$

$$X_5 = 44.44$$

$$X_6 = 66.67$$

Optimal Profit = \$ 2625.56



integer constraint

In order to follow the **Number Constraint**:

$$X_1 = 88$$

$$X_2 = 88$$

$$X_3 = 66$$

$$X_4 = 44$$

$$X_5 = 44$$

$$X_6 = 66$$

Optimal Profit = \$ 2599.3