Module 2 assignment: The LP Model

1- Back Savers Company:

Decision Variables:
Let C = The number of Collegiate to be produced,
M= The number of Mini to be produced

Objective Function:
Max Profit (X) = 32C +24M

Subject to Constraints:

Supply constraints: 3C + 2M $\leq$ 5000
Labor constraints: 0.75C + 0.67M $\leq$ 1400
Demand constraints: C $\leq$ 1000 ,
M $\leq$ 1200

Where C $\geq$ 0 , M $\geq$ 0

2- The Weigelt Corporation

Decision Variables:
L_1 = Number of large size products to be produced per day in Plant 1
L_2 = Number of large size products to be produced per day in Plant 2
L_3= Number of large size products to be produced per day in Plant 3
M_1= Number of Medium size products to be produced per day in Plant 1
M_2= Number of Medium size products to be produced per day in Plant 2
M_3= Number of Medium size products to be produced per day in Plant 3
S_1= Number of Small size products to be produced per day in Plant 1
S_2= Number of Small size products to be produced per day in Plant 2
S_3= Number of Small size products to be produced per day in Plant 3

Objective Function:
Max Profit (Z)= $420L_1 + 420L_2 + 420L_3 + 360M_1 + 360M_2 + 360M_3 + 300S_1 + 300S_2 + 300S_3$

Subject to Constraints:
Sales Forecast Constraints: $L_1 + L_2 + L_3 \leq 900$,
$M_1 + M_2 + M_3 \leq 1200$,
$S_1 + S_2 + S_3 \leq 750$

Plants capacity Constraints:
$20L_1 + 15M_1 + 12S_1 \leq 13000$,
$20L_2 + 15M_2 + 12S_2 \leq 12000$,
$20L_3 + 15M_3 + 12S_3 \leq 5000$

Plants Excess capacity constraints:
$900 (L_1 + M_1 + S_1) - 750 (L_2 + M_2 + S_2) = 0$
$450(L_1 + M_1 + S_1) - 750 (L_3 + M_3 + S_3) = 0$

Production Capacity Constraints:
$L_1 + M_1 + S_1 \leq 750$
$L_2 + M_2 + S_2 \leq 900$
$L_3 + M_3 + S_3 \leq 450$

Where $L_1, M_1, S_1, L_2, M_2, S_2, L_3, M_3, S_3 \geq 0$