**Formulating the linear programing problem**

Product X units can be produced at plant (1,2,3) of product size (L, M, S)

|  |  |  |  |
| --- | --- | --- | --- |
| Plant / Product | Large | Medium | Small |
| 1 | X1L | X1M | X1S |
| 2 | X2L | X2M | X2S |
| 3 | X3L | X3M | X3S |
| Profit per unit | $385 | $330 | $275 |

Maximum Profit Z = 385 (X1L + X2L + X3L) + 330 (X1M + X1M + X1L) + 275 (X1S + X2S + X3S)

X1L + X1M + X1S ≤ 750

X2L + X2M + X2S ≤ 900 Capacity constraint

X3L + X3M + X3S ≤ 450

20X1L + 15X1M + 12X1S ≤ 13000

20X2L + 15X2M + 12X2S ≤ 12000 Storage space constraint

20X3L + 15X3M + 12X3S ≤ 5000

X1L + X2L + X3L ≤ 900

X1M + X2M + X3M ≤ 1200 Product of each size sold per day

X1S + X2S + X3S ≤ 750

X1L + X1M + X1S \_ X2L + X2M + X2S = 0

750 900

X1L + X1M + X1S \_ X3L + X3M + X3S = 0

750 450

XPS (P=1,2,3; S= L, M, S) ≥ 0

Solved using R