

Index Sets: $I = \{B, S\}$ $J = \{D, C, T\}$

where B is Buckhead, S = Sandy Springs, D = desk, C = chair, T = table

Decision Variables:

X_{ij} = # of items of type j shipped to store i , $i \in I, j \in J$

X_e = # of lumber used that we do not have to buy

X_e' = # of lumber used that we purchase

X_a = # of assembly hours that are not overtime

X_a' = # of overtime assembly hours

X_f = # of regular finishing hours

X_f' = # of overtime finishing hours.

Problem:

$$\max 35x_D + 20x_C + 25x_T - 3x_e' - 0x_e - x_a - 2x_a' - 2x_f - 4x_f' - 3(x_{BD} + x_{BC} + x_{BT}) - 2(x_{SD} + x_{SC} + x_{ST})$$

$$\text{s.t. } 10x_D + 3x_C + 6x_T \leq x_e + x_e'$$

$$5x_D + 3x_C + 3x_T \leq x_a + x_a'$$

$$4x_D + 2x_C + 2x_T \leq x_f + x_f'$$

$$x_a' + x_f' \leq 40$$

$$x_{BD} + x_{SD} = x_D \quad x_{BT} + x_{ST} = x_T$$

$$x_{BC} + x_{SC} = x_C$$

$$0 \leq x_{BD} \leq 4 \quad 0 \leq x_{BC} \leq 5 \quad 0 \leq x_{BT} \leq 3$$

$$0 \leq x_{SD} \leq 3 \quad 0 \leq x_{SC} \leq 4 \quad 0 \leq x_{ST} \leq 6$$

$$0 \leq x_a \leq 60 \quad 0 \leq x_f \leq 40 \quad 0 \leq x_e \leq 50 \quad 0 \leq$$

$$0 \leq x_a' \quad 0 \leq x_f' \quad 0 \leq x_e' \leq 100$$