



b) No, we can't find an alternative with lower than 10 setups. Because  $\sum_{t=14}^{23} c_t - \sum_{t=14}^{23} r_t = 75 < 90$ .

2. Let  $c_{ij} \Rightarrow$  cost of ordering in period  $i$  to satisfy demand in period  $i$  through  $j - 1$ .

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$$c_{12} = 100$$

$$c_{13} = 100 + 0.5 \times 75 = 137.5$$

$$c_{14} = 100 + 0.5 \times 75 + 2 \times 0.5 \times 100 = 237.5$$

$$c_{15} = 237.5 + 3 \times 0.5 \times 70 = 342.5$$

$$c_{16} = 342.5 + 4 \times 0.5 \times 80 = 502.5$$

$$c_{23} = 100 \quad c_{24} = 100 + 0.5 \times 100 = 150$$

$$c_{25} = 150 + 2 \times 0.5 \times 70 = 220 \quad c_{26} = 220 + 3 \times 0.5 \times 80 = 340$$

$$c_{34} = 100 \quad c_{35} = 100 + 70 \times 0.5 = 135 \quad c_{36} + 2 \times 0.5 \times 80 = 215$$

$$c_{45} = 100 \quad c_{46} = 100 + 0.5 \times 80 = 140 \quad c_{56} = 100$$

$$\begin{aligned}
 & f_6 = 0 \\
 f_5 &= \min\{c_{56} + f_6\} = 100 \\
 f_4 &= \min \left\{ \begin{array}{l} 45 + f_5 = 200 \\ c_{46} + f_6 = 140 \end{array} \right\} = 140 \\
 f_3 &= \min \left\{ \begin{array}{l} 34 + f_4 = 240 \\ c_{35} + f_5 = 235 \\ c_{36} + f_6 = 215 \end{array} \right\} = 215 \\
 f_2 &= \min \left\{ \begin{array}{l} 23 + f_3 = 315 \\ c_{24} + f_4 = 290 \\ c_{25} + f_5 = 320 \\ c_{26} + f_6 = 340 \end{array} \right\} = 290 \\
 f_1 &= \min \left\{ \begin{array}{l} 12 + f_2 = 390 \\ c_{13} + f_3 = 352.5 \\ c_{14} + f_4 = 377.5 \\ c_{15} + f_5 = 442.5 \\ c_{16} + f_6 = 502.5 \end{array} \right\}
 \end{aligned}$$

$\Rightarrow$  optimal lot sizing

Week	1	2	3	4	5
POR	125	0	250	0	0

$\Rightarrow$  T.C. = 352.5