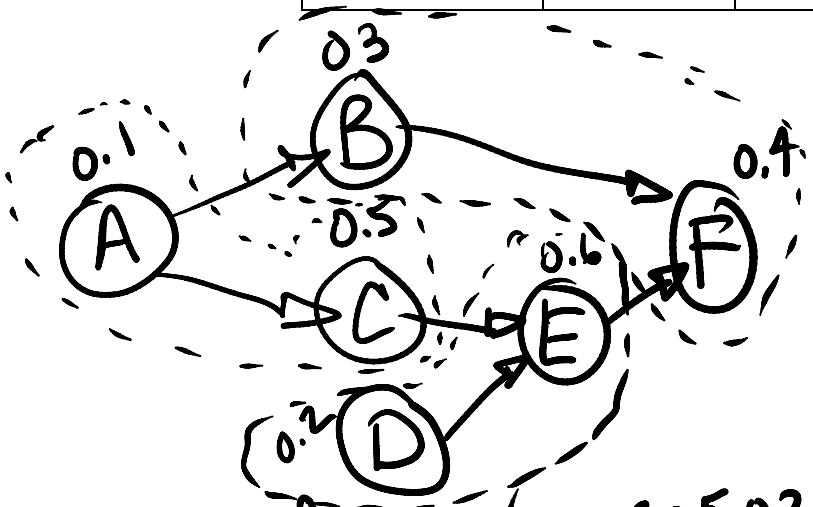
Line Balancing Example - OMGT6213

Tina's department needs to service 3,000 calls per 40-hour workweek (i.e., Tina's desired cycle time is 0.8 min). The process of servicing calls can be broken down into the six stations listed above. The precedence and time requirements for each element are as follows in Table 1.2. Tina needs to draw and label a precedence diagram for the service process. Finally, she needs to balance the line, calculate the efficiency of the line, and identify where and how much idle time exists.

$C_T = \frac{40 \times 60}{3000} = 0.8$

Table 1.2 – Precedence and Time Requirements

Work Element	Predecessor	Performance Time (min)
A-Receive Call	-	0.1
B-Route Call	A	0.3
C-Tag Call	A	0.5
D-Start Form G	-	0.2
E-Fill in Box 22	C, D	0.6
F-Advise Caller	B, E	0.4



FlowTime > 0.1 + 0.3 + 0.5 + 0.2 + 0.6 + 0.4 = 2.1 min

$\text{Min Work Stations} = \frac{FT}{C_T} = \frac{2.1}{0.8} \approx 3$

CycleTime PD = Max (0.1, 0.3, 0.5, 0.2, 0.6, 0.4) = 0.6

Work Center	Time to Complete	IDLE
1) A, C	0.6	0.2 (0.8 − 0.6) = 0.2
2) B, F	0.7	0.1
3) D, E	0.8	0.0
		0.3 total IDLE

$\text{IDLE} = (\text{Actual \# WS})(\text{Cycle TIME}) - \text{FlowTIME}$

$= 3 \cdot 0.8 - 2.1 = 2.4 - 2.1 = 0.3$

$\%\text{IDLE} = \frac{\text{IDLE}}{(\text{Actual \# WS}) \cdot \text{Cycle TIME}} = \frac{0.3}{2.4} \approx 12.5\%$