“Largest work-element time” rule

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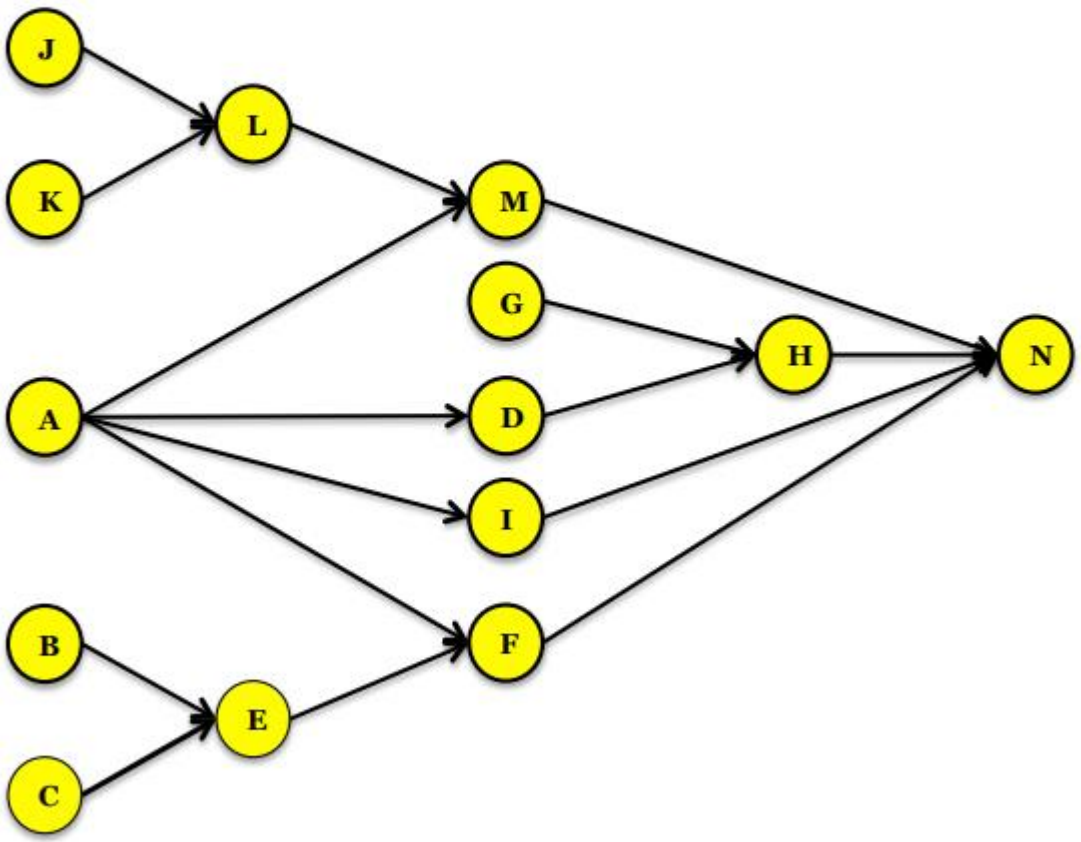
Same procedure as RPWT, but instead of choosing the work-element with the highest RPW, choose the work-element with the largest time (as long as the precedence requirements are fulfilled).

A company wants to design a new assembly line for their latest products. The company wants to produce at least 270 units per day and they expect to operate the production line 450 minutes per day. The assembly requires 14 different tasks and the work element data is shown in the table below.

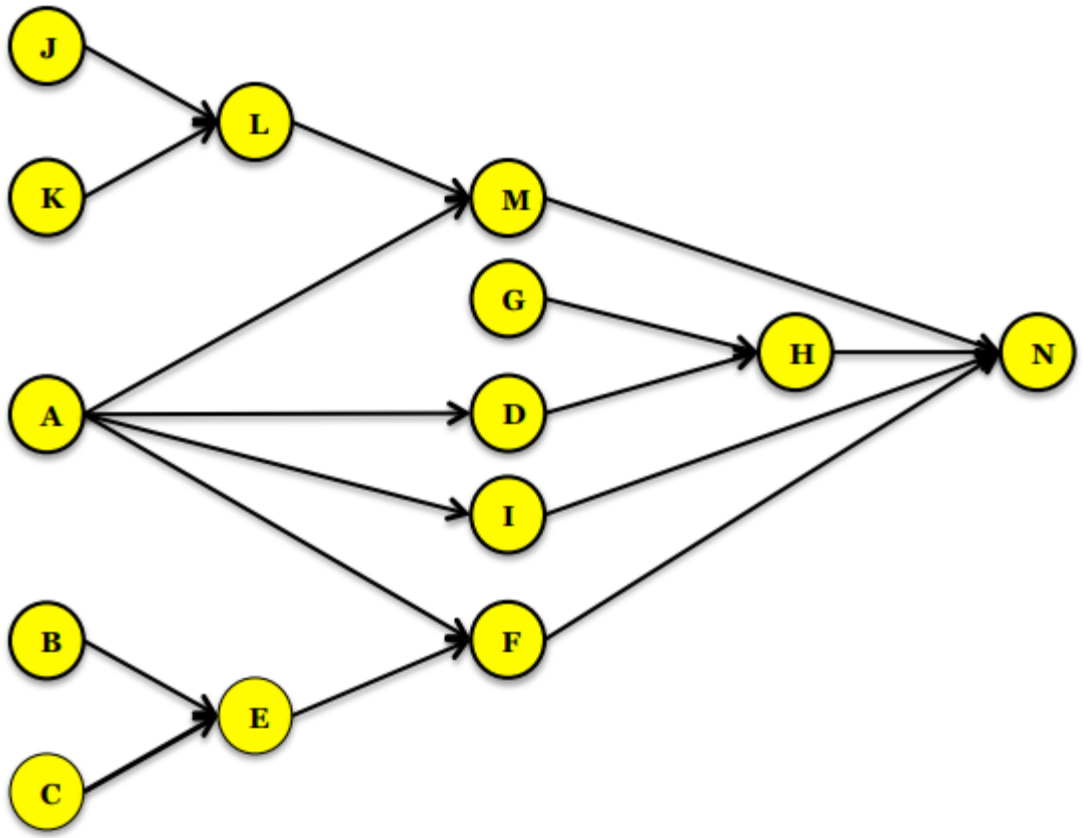
Work element	Time (seconds)	Immediate Predecessor(s)
A	10	None
B	25	None
C	10	None
D	35	A
E	65	B, C
F	35	A, E
G	30	None
H	20	D, G
I	45	A
J	50	None
K	20	None
L	40	J, K
M	30	A, L
N	70	F, H, I, M

a) Draw a precedence diagram.
b) What cycle time results in the desired output rate?
c) What is the theoretical minimum number of work stations?
d) Using longest work-element rule, balance the assembly line.
e) What is the efficiency of your solution?



b) CT = (450x60) / 270 = 100s/unit.

c) Total process time = 485s.
485/100 = 4.85, which means that at least 5 stations are required.



c) Longest Work Element rule gives:

Station	Element	Cumulative time	Slack
S1	J	50	
	G	80	
	K	100	0
S2	L	40	
	B	65	
	C	75	
	A	85	15
S3	E	65	
	F	100	0
S4	D	35	
	I	80	
	H	100	0
S5	M	30	
	N	100	0

d) Efficiency: 485/(5x100) = 97%