

PLEASE REFER TO EXAMPLE 2 ON P. 137 OF THE MNO3701 STUDY GUIDE

EST_i	EFT_i
i	T_i
LST_i	LFT_i

t_i = DURATION required to perform activity i

EST_i = earliest possible start for activity i

EFT_i = earliest possible finish for activity i

LST_i = latest possible start for activity i

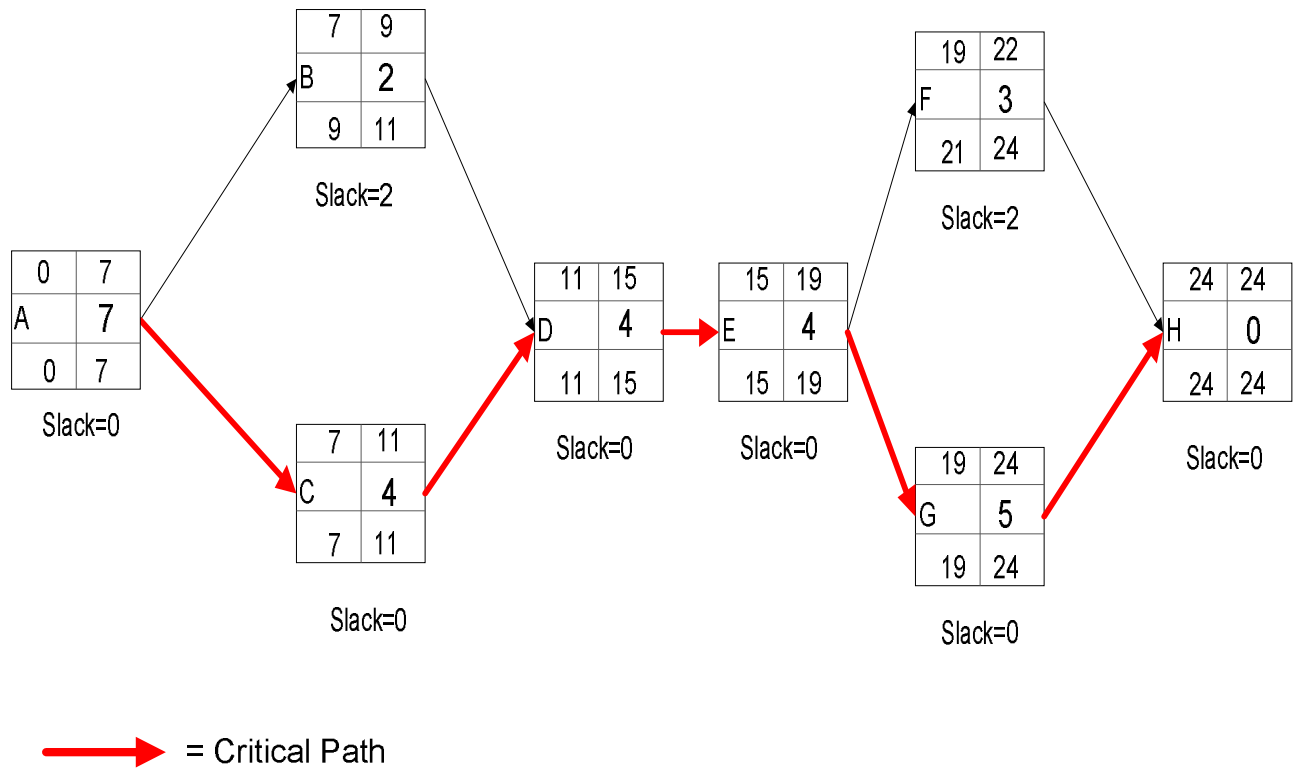
LFT_i = latest possible finish for activity i

Activity	Activity time (days)	Immediate followers
A	7	B,C
B	2	D
C	4	D
D	4	E
E	4	F,G
F	3	H
G	5	H
H	0	-

- (a) Draw the network diagram for this project.
- (b) Determine the critical path and project duration.
- (c) Calculate the free slack for each activity.

Solution (example 2 p.137):

Work from **left to right** through the network in calculating the ES and EF times. Then work from **right to left** calculating the LS and LF.



EXPLANATION: FORWARD PASS (left to right)Activity A:

0	7
A	7

$$0 + 7 = 7$$

Activity B: (7 "carried" over to activity B [ES])

7	9
B	2

$$7 + 2 = 9$$

Activity C: (7 "carried" over to activity C [ES])

7	11
C	4

$$7 + 4 = 11$$

Activity D: (11 "carried" over to activity D [ES] - largest [EF] will determine the [ES] of the follower activity; 11 is larger than 9)

11	15
D	4

$$11 + 4 = 15$$

Activity E: (15 "carried" over to activity E [ES])

15	19
<i>E</i>	4

$$15 + 4 = 19$$

Activity F: (19 "carried" over to activity F [ES])

19	22
<i>F</i>	3

$$19 + 3 = 22$$

Activity G: (19 "carried" over to activity G [ES])

19	24
<i>G</i>	5

$$19 + 5 = 24$$

Activity H: (24 "carried" over to activity H [ES] - largest [EF] will determine the [ES] of the follower activity; 24 is larger than 22)

24	24
<i>H</i>	0

$$24 + 0 = 24$$

EXPLANATION: BACKWARD PASS (right to left)Activity H:

24	24
<i>H</i>	0
24	24

$$24 - 0 = 24$$

Activity G: (24 "carried" over to activity G [LF])

19	24
<i>G</i>	5
19	24

$$24 - 5 = 19$$

Activity F: (24 "carried" over to activity F [LF])

19	22
<i>F</i>	3
21	24

$$24 - 3 = 21$$

Activity E: (19 "carried" over to activity E [LF] - If an activity has more than one follower, then the smallest follower LS will determine the LF of the preceding activity; 19 is smaller than 21)

15	19
<i>E</i>	4
15	19

$$19 - 4 = 15$$

Activity D: (15 "carried" over to activity D [LF])

11	15
<i>D</i>	4
11	15

$$15 - 4 = 11$$

Activity C: (11 "carried" over to activity C [LF])

7	11
<i>C</i>	4
7	11

$$11 - 4 = 7$$

Activity B: (11 "carried" over to activity B [LF])

7	9
<i>B</i>	2
9	11

$$11 - 2 = 9$$

Activity A: (7 "carried" over to activity A [LF] - If an activity has more than one follower, then the smallest follower LS will determine the LF of the preceding activity; 7 is smaller than 9)

0	7
<i>A</i>	7
0	7

$$7 - 7 = 0$$