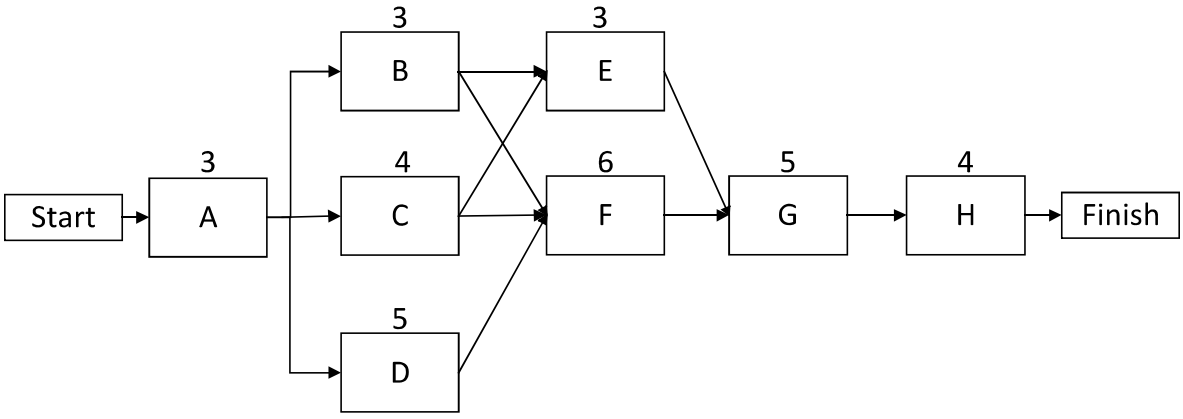
Practice 2

Here is a table of the network diagram that you will need to draw out and answer the following questions:

Activity	Preceding Activity	Durations(in days)
Start		0
A	Start	3
B	A	3
C	A	4
D	A	5
E	B, C	3
F	B, C, D	6
G	E, F	5
H	G	4
Finish	H	0

1. What is the critical path?
2. What is the slack on activity C?
3. What is the late start on activity F?
4. What happens if B is increased to 7 days?

Your first task would have been to draw the diagram as follows:



Make a box for Start and then follow the table to link the activities. Next, we will find all the paths:

1. Start, A, B, E, G, G, H Finish = 18
2. Start, A, B, F, G, H, Finish = 21
3. Start, A, C, E, F, G, H, Finish = 19
4. Start, A, C, F, G, H, Finish = 22
5. **Start, A, D, F, G, H, Finish = 23**

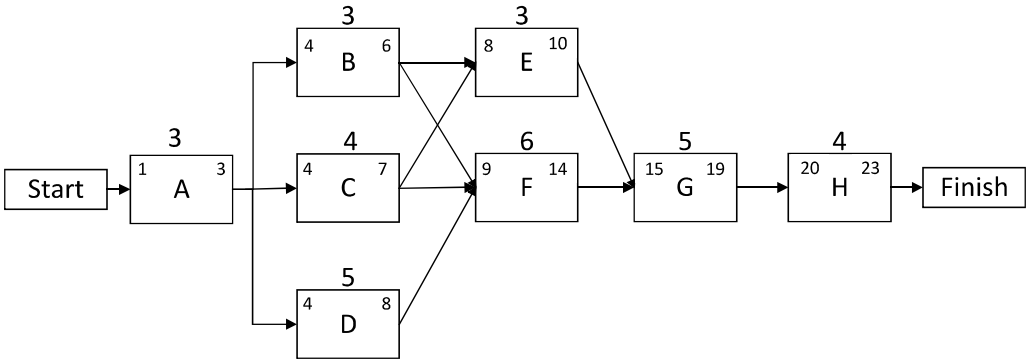
The critical path is Start, A, D, F, G, H, Finish. That is the longest path on the diagram.

Next, we will do the forward and backwards passes as follows:

Forward Pass:

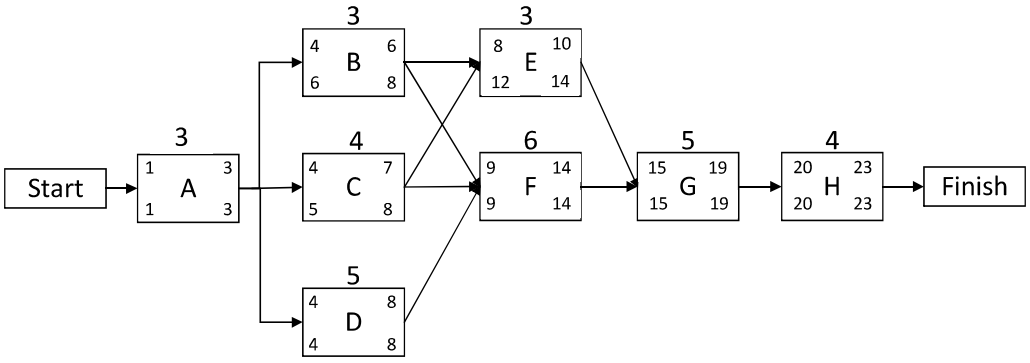
- On A, make the ES 1 because it starts day one. The EF would be 3. That you can get from the formula: 1 + 3 – 1 = 3
- On B, make the ES 4 because it will start the day after A. The EF would be 6. That you can get from the formula: 4 + 3 – 1 = 6
- On C, make the ES 4 because it starts one day after A. The EF would be 7. That you can get from the formula: 4 + 4 – 1 = 7
- On D, make the ES 4 because it starts one day after A. The EF would be 8. That you can get from the formula: 4 + 5 – 1 = 8
- On E, make the ES 8 because it starts one day after C, which is the longest of B and C. The EF would be 10. That you can get from the formula: 8 + 3 – 1 = 10
- On F, make the ES 9 because it starts one day after D, which is the longest of B, C, and D. The EF would be 14. That you can get from the formula: 9 + 6 – 1 = 14
- On G, make the ES 15 because it starts one day after F. The EF would be 19. That you can get from the formula: 15 + 5 – 1 = 19
- On H, make the ES 20 because it starts one day after G. The EF would be 23. That you can get from the formula: 20 + 4 – 1 = 23

The diagram should like the one below. We still cannot answer all the questions without doing a backwards pass



Backward Pass

- On H, make the LF 23, since that is the latest the project can be done. The LS will be 20. That you can get using the formula of 23 – 4 + 1 = 20.
- On G, make the LF 19, since H will late start on 20. The LS will be 15. That you can get using the formula of 19 – 5 + 1 = 15.
- On F, make the LF 14, since G will late start on 15. The LS will be 9. That you can get using the formula of 14 – 6 + 1 = 9.
- On E, make the LF 14, since G will late start on 15. The LS will be 12. That you can get using the formula of 14 – 3 + 1 = 12.
- On D, make the LF 8, since F will late start on 9. The LS will be 4. That you can get using the formula of 8 – 5 + 1 = 4.
- On C, make the LF 8, since E will late start on 9. The LS will be 5. That you can get using the formula of 8 – 4 + 1 = 5.
- On B, make the LF 8, since E will late start on 9. The LS will be 6. That you can get using the formula of 8 – 3 + 1 = 6.
- On A, make the LF 3, since D will late start on 4. The LS will be 1. That you can get using the formula of 3 – 3 + 1 = 1.



The answers to the questions are as follows now that we have the full diagram:

1. **What is the critical path?**
   The critical path is Start, A, D, F, G, H, Finish = 23
2. **What is the slack on activity C?**
   The slack of C is one day, since LF-EF or 8 – 7 = 1 or LS-ES or 5 – 4 = 1. This means that you can delay activity C by one day and still have it not affect the project schedule.
3. **What is the latest we can start activity F?**
   Day 9
4. **What happens if B increases to 7 days?**
   Increasing B to 7 days would change the critical path to Start, A, B, F, G, H, Finish. The new end would be on day 25 instead of day 23.