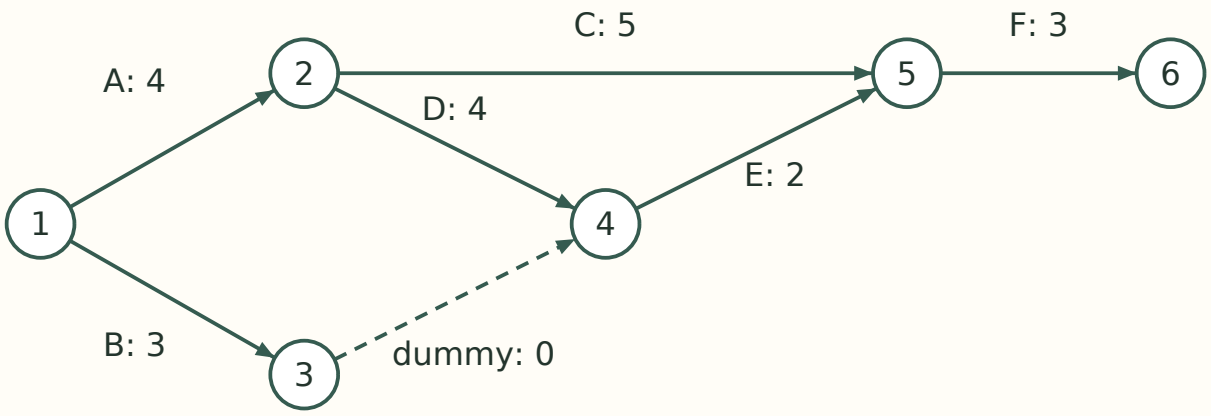
Forward and backward scans

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. Perform a complete forward scan on the displayed network. [4 marks]



Activity-on-arrow network; durations are in days.

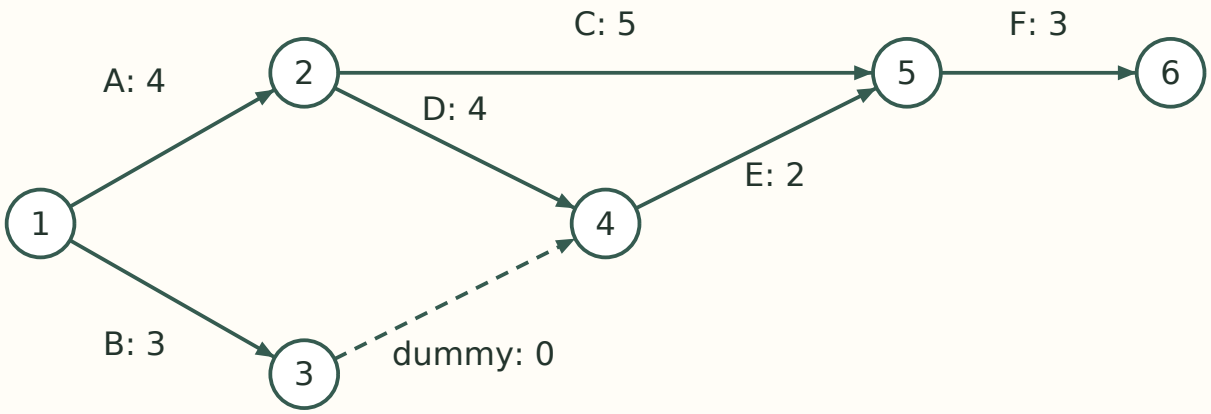
E1=0; E2=4; E3=3.

E4=max(4+4,3+0)=8.

E5=max(4+5,8+2)=10; E6=10+3=13.

Answer: Events 1-6: 0, 4, 3, 8, 10, 13.

2. Perform the backward scan for the displayed network using project finish 13. [4 marks]



Activity-on-arrow network; durations are in days.

L6=13; L5=10; L4=8; L3=8.

L2=min(10−5,8−4)=4.

L1=min(4−4,8−3)=0.

Answer: Events 1-6 latest: 0, 4, 8, 8, 10, 13.

3. Find the earliest time at a merge when incoming tail times and durations are (2,7), (6,2) and (4,6). [2 marks]

Candidates are 9, 8 and 10.

Their maximum is 10.

Answer: 10.

4. Find a latest event time when outgoing head times and durations are (15,4), (19,6) and (14,2). [2 marks]

Candidates are 11, 13 and 12.

Their minimum is 11.

Answer: 11.

5. A forward scan gives an event earliest time 9. A claimed backward scan gives latest time 7 for a finish target equal to the earliest project finish. What does this indicate? [2 marks]

The event cannot both require at least 9 and be required by 7.

Recheck durations, directions and the final-time assumption.

Answer: The scans or the model contain an error.

6. Why does adding all incoming durations at a merge usually give the wrong earliest time? [2 marks]

Each candidate already measures elapsed time from the common start.

The event waits for the latest arrival, not the sum of arrivals.

Answer: It assumes parallel branches occurred one after another.