Chapter 6 Activity planning

Further exercise pointers

1. Draw an activity network using either activity-on-node or activity-on-arrow network conventions for each of the following projects:
- *Redecorating a room;*
- *Choosing and purchasing a desktop computer;*
- *Organizing and carrying out a survey of users' opinions of an information system.*

The precise nature of the networks drawn up will depend on the particular approaches taken. There are no sole correct answers, but plenty of scope for discussion.

2. If you have access to a project planning exercise, use it to produce a project plan for the IOE maintenance group accounts project. Base you plan on that used for Exercise 6.2 and verify that your application reports the same information as you calculated manually when you did the exercise.

3. Based on your answer to Exercise 6.2, discuss the options Amanda might consider if she found it necessary to complete the project earlier than day 104?
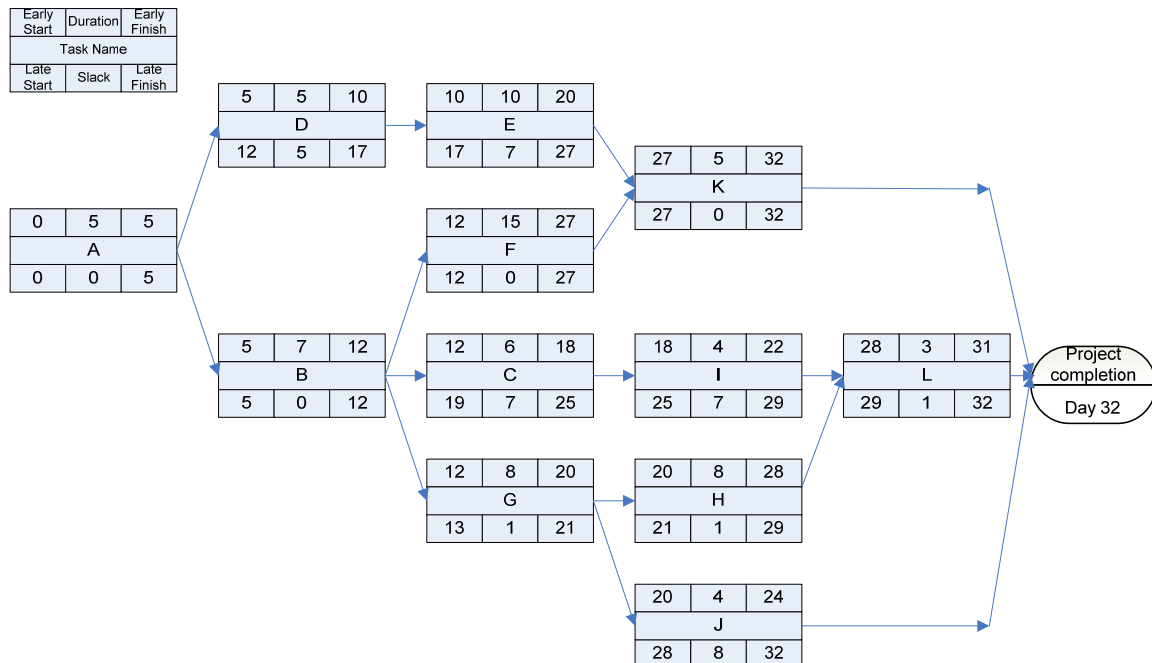
One option could be to sacrifice the 'check specifications' activity. This in itself would save 2 days. Because 'design module A' which is on the critical path would no longer be dependent on 'specify module C', which takes 25 days, but is only dependent on 'specify module A' which is 20 days then this would save a further 5 days. This option would be at the expense of possible quality shortfalls, which might mean that system integration might take longer than the 6 days currently allocated.

If further cuts were required then you might consider dividing modules up into smaller components that could be developed in parallel. This would require additional design and specification effort and also more co-ordination and integration. Additional staff would need to be deployed.

4. Create a precedence activity network using the following details:

Activity	Depends on	Duration (days)
A		5
B	A	7
C	B	6
D	A	5
E	D	10
F	B	15
G	B	8
H	G	8
I	C	4
J	G	4
K	E,F	5
L	I,H	3

5. Calculate the earliest and latest start and end dates and the float associated with each activity. From this identify the critical path.

Legend:

Early Start	Duration	Early Finish
	Task Name	
Late Start	Slack	Late Finish

5	5	10
	D	
12	5	17

10	10	20
	E	
17	7	27

27	5	32
	K	
27	0	32

0	5	5
	A	
0	0	5

12	15	27
	F	
12	0	27

5	7	12
	B	
5	0	12

12	6	18
	C	
19	7	25

18	4	22
	I	
25	7	29

28	3	31
	L	
29	1	32

Project completion — Day 32

12	8	20
	G	
13	1	21

20	8	28
	H	
21	1	29

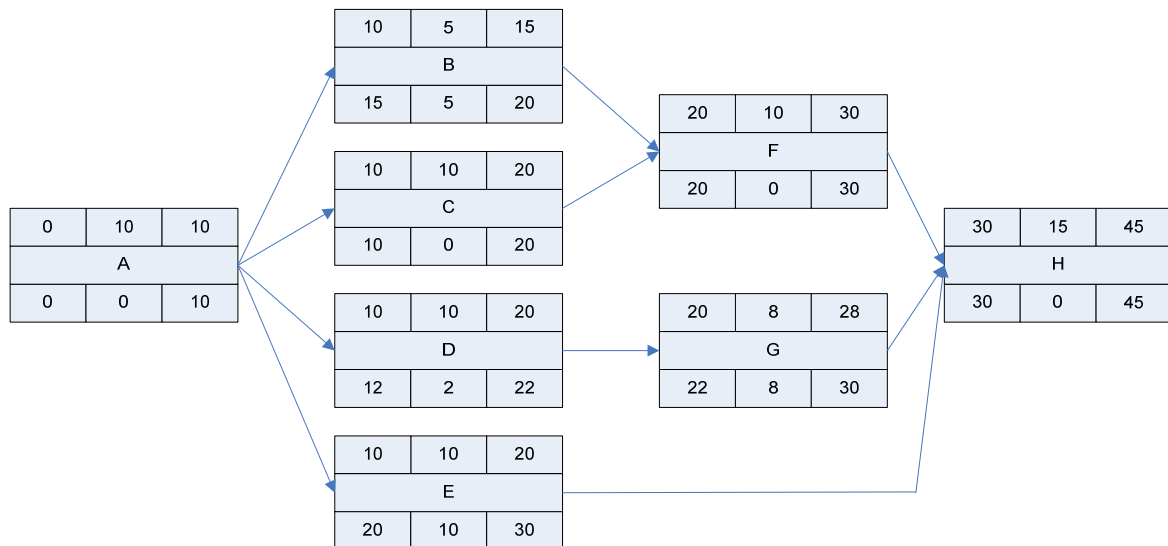| 20	4	24
	J	
28	8	32

The critical path is A-B-F-K where all the floats are 0.

6. Draw up an activity network for the following scenario:

The specification of an IT application is estimated as likely to take two weeks to complete. When this activity has been completed, work can start on three software modules, A,B and C. Design/coding of the modules will need 5, 10 and 10 days respectively. Modules A and B can only be unit -tested together as their functionality is closely associated. This joint testing should take about two weeks. Module C will need eight days of unit testing. When all unit testing has been completed, integrated system testing will be needed taking a further three weeks. This testing will be based on the functionality described in the specification and will need 10 days of planning.

4. For the activity network in 3 above, derive the earliest and latest start dates for each activity and the earliest and latest finish dates. Work out the shortest project duration

A	Specify application	E	Plan integration testing
B	Design/code module A	F	Unit test modules A and B
C	Design/code module B	G	Unit test module C
D	Design/code module C	H	Integration testing

5. What are the limitations of the PERT notation?
These might include:
- Activity networks imply a clean-cut division between the finish of one activity and the start of another, which is often not the case.
- Activity networks do not take account of iterative processes.
- Conditional activities are not catered for e.g. 'if X happens, do Y'

9. Consider a software project with 5 tasks T1--T5. Duration of the 5 tasks in weeks are 3,2,3,5,2 respectively. T2 and T4 can start when T1 is complete. T3 can start when T2 is complete. A T5 can start when both T3 and T4 are complete. Draw the CPM network representation of the project. When is the latest start date of the task T3? What is the float time of the task T4? Which tasks are on the critical path?

Activity	Duration (Weeks)	Earliest Start date	Latest Start date	Earliest Finish date	Latest Finish date	Total float
T1	3	0	0	3	3	0
T2	2	3	3	5	5	0
T3	3	5	5	8	8	0
T4	5	3	3	8	8	0
T5	2	8	8	16	16	0