Software Project Management

Chapter Six

Activity planning

Scheduling

‘Time is nature’s way of stopping everything happening at once’

Having

- worked out a method of doing the project
- identified the tasks to be carried
- assessed the time needed to do each task

need to allocate dates/times for the start and end of each activity

Activity networks

These help us to:

- Assess the feasibility of the planned project completion date
- Identify when resources will need to be deployed to activities
- Calculate when costs will be incurred

This helps the co-ordination and motivation of the project team

Defining activities

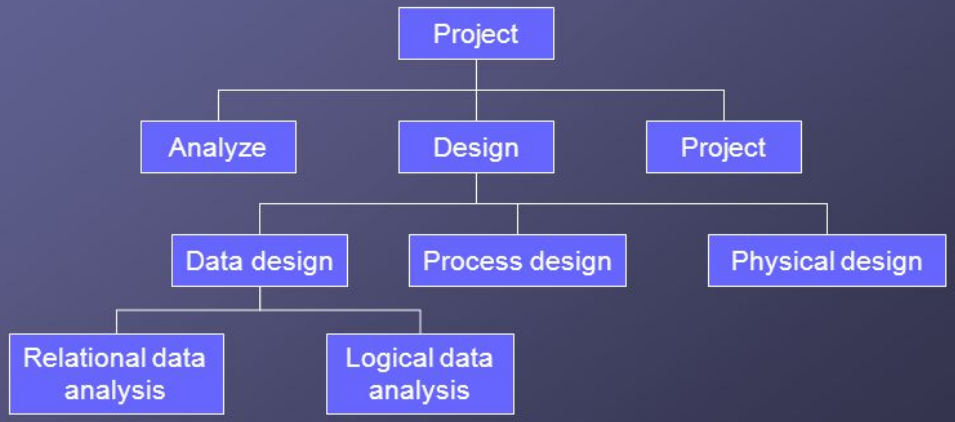
Activity networks are based on some assumptions:

- A project is:
  - Composed of a number of **activities**
  - May start when at least one of its activities is ready to start
  - Completed when all its activities are completed

Activity based approach

Activity based approach (2)

- WBS Example



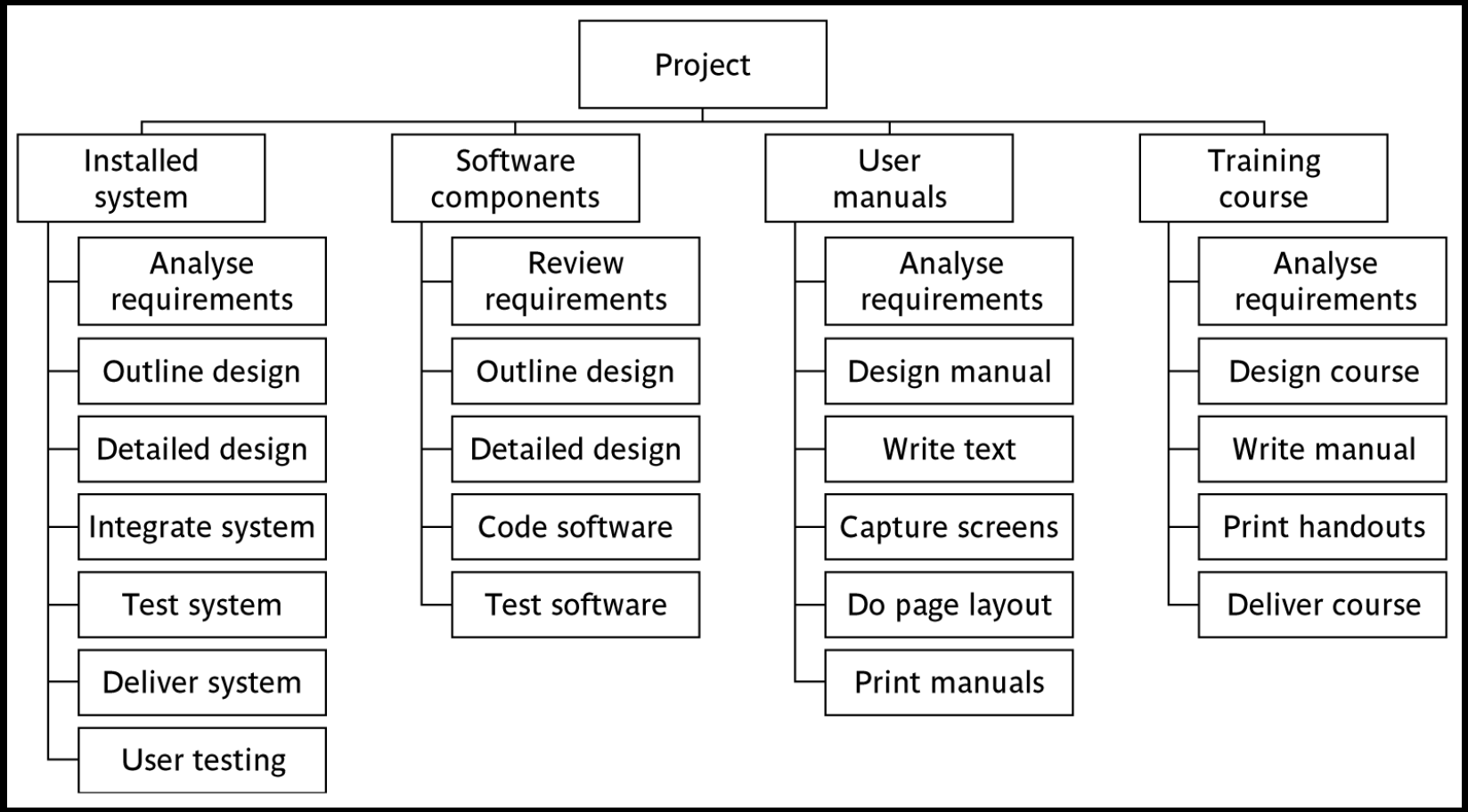
Defining activities -continued

- An activity
  - Must have clearly defined start and end-points
  - Must have resource requirements that can be forecast: these are assumed to be constant throughout the project
  - Must have a duration that can be forecast
  - May be dependent on other activities being completed first (precedence networks)

Identifying activities

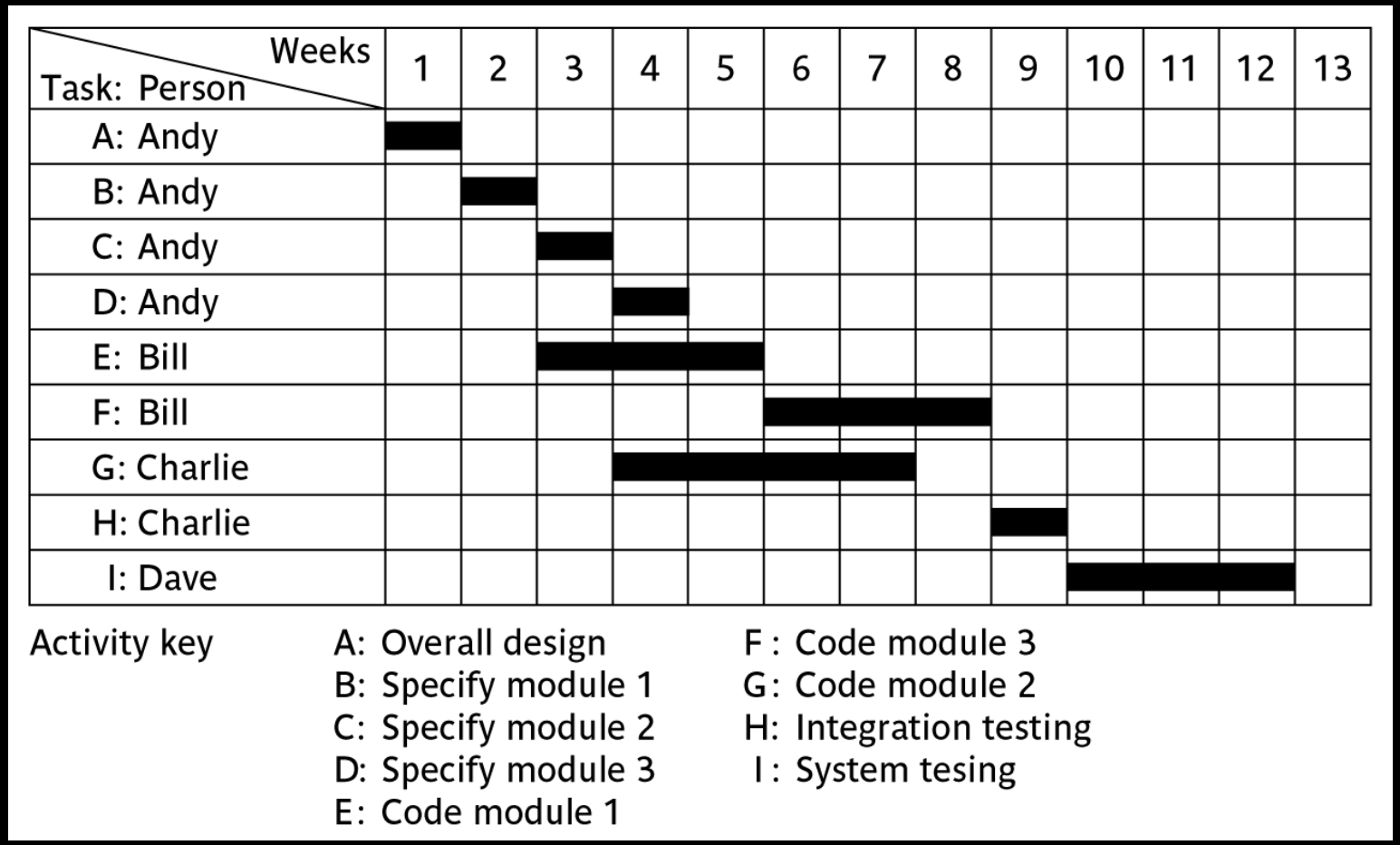
- Work-based: draw-up a Work Breakdown Structure listing the work items needed
- Product-based approach
  - list the deliverable and intermediate products of project – product breakdown structure (PBS)
  - Identify the order in which products have to be created
  - work out the activities needed to create the products

Hybrid approach

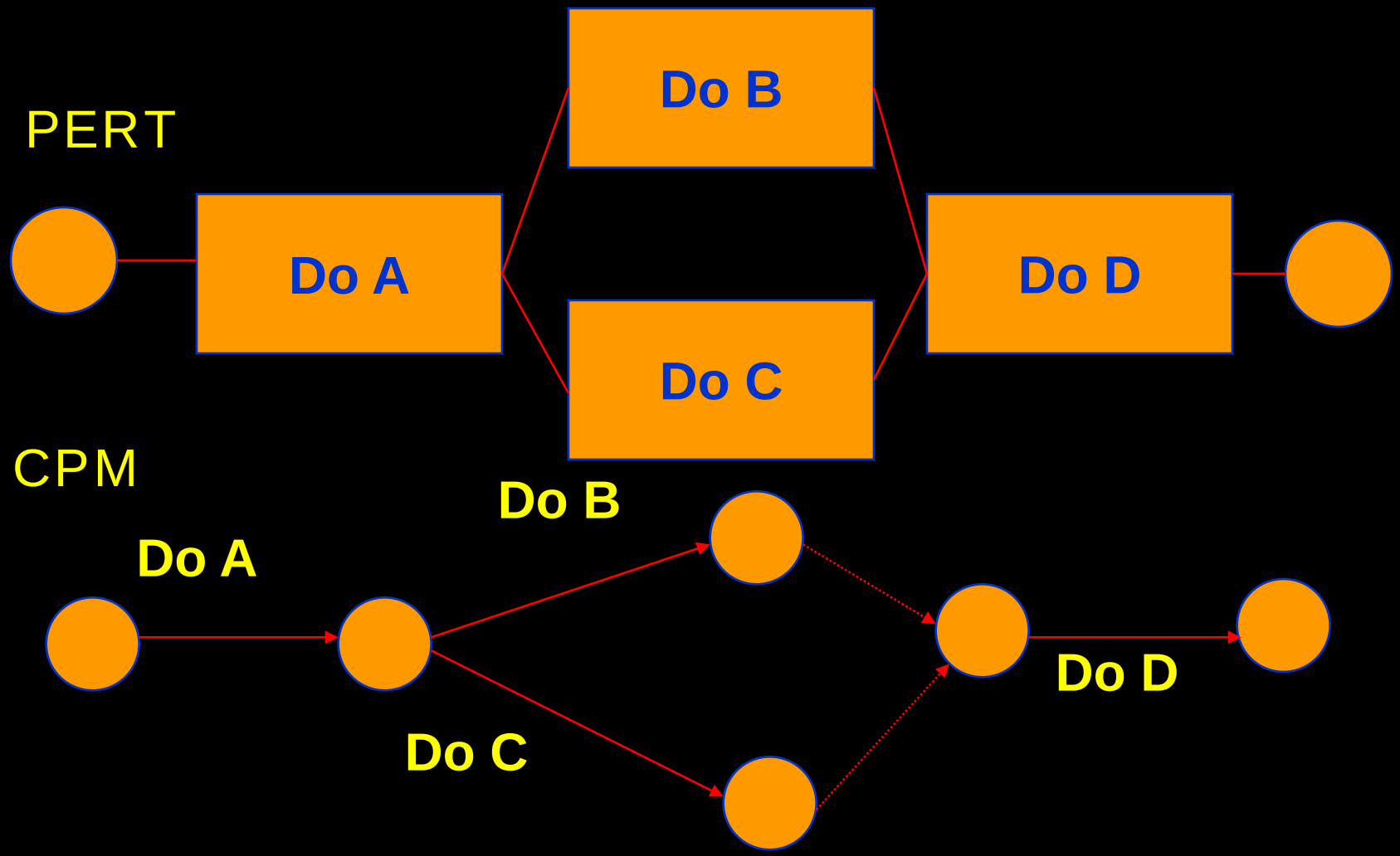


Sequencing and scheduling activities

A project plan as a bar chart

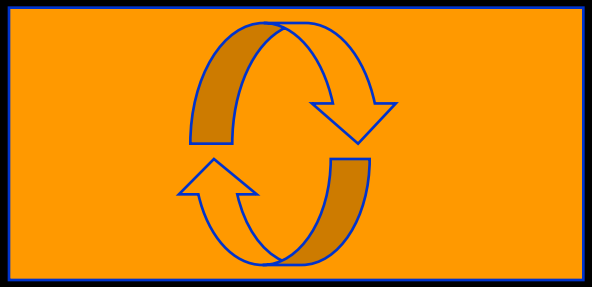


PERT vs CPM



Drawing up a PERT diagram

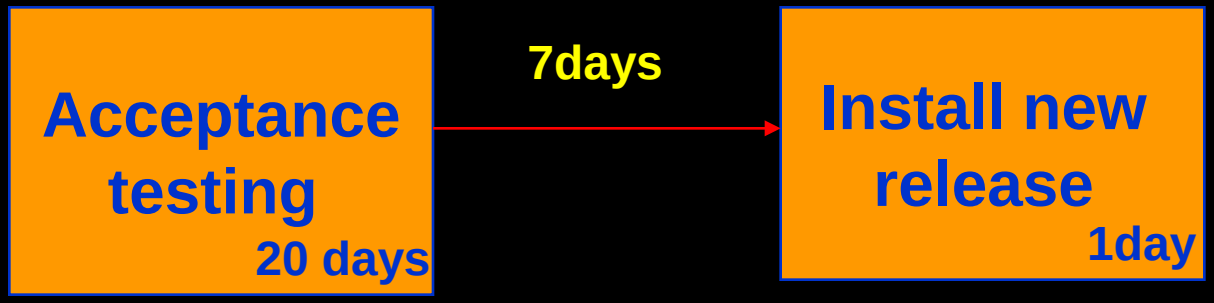
- No looping back is allowed – deal with iterations by hiding them within single activities



- *milestones* – ‘activities’, such as the start and end of the project, which indicate transition points. They have zero duration.

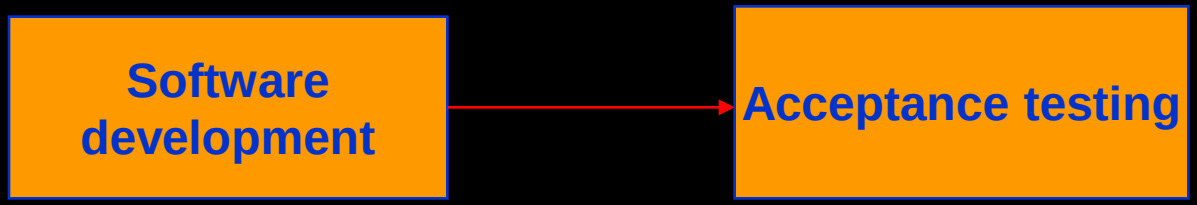
Lagged activities

- where there is a fixed delay between activities e.g. seven days notice has to be given to users that a new release has been signed off and is to be installed

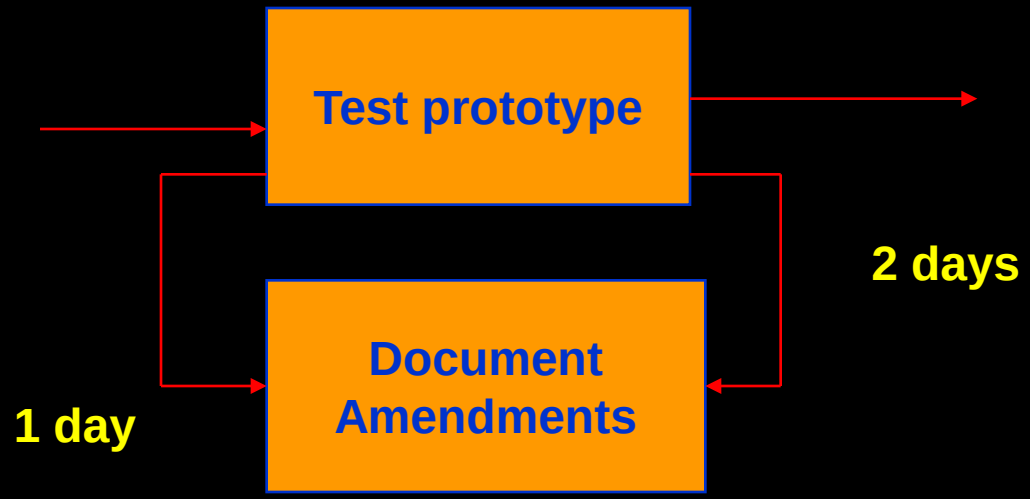


Types of links between activities

- Finish to start

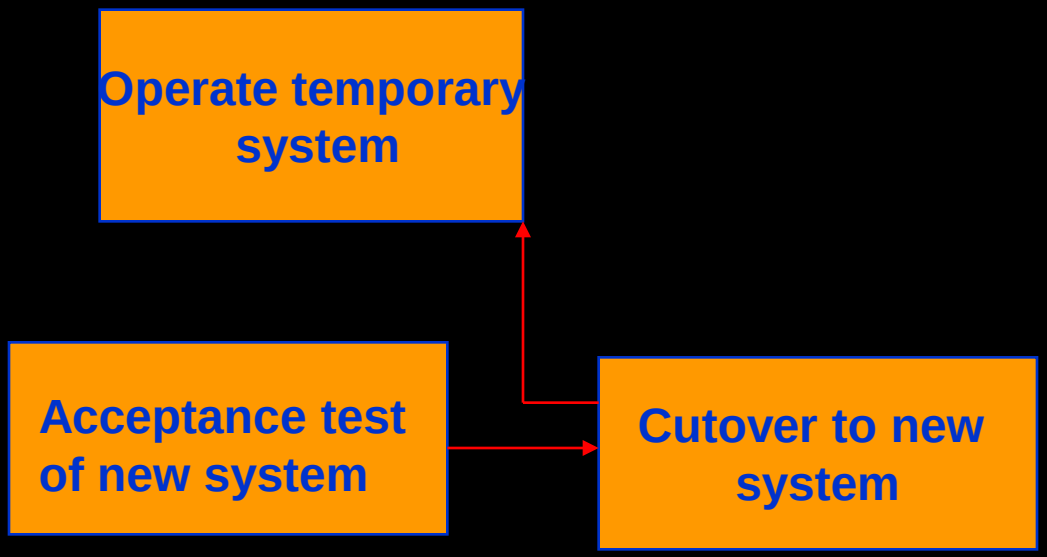


- Start to start/ Finish to finish



Types of links between activities

- Start to finish



Start and finish times

- Activity ‘write report software’
- Earliest start (ES)
- Earliest finish (EF) = ES + duration
- Latest finish (LF) = latest task can be completed without affecting project end Latest start = LF - duration

Example

- earliest start = day 5
- latest finish = day 30
- duration = 10 days

- earliest finish = ?
- latest start = ?

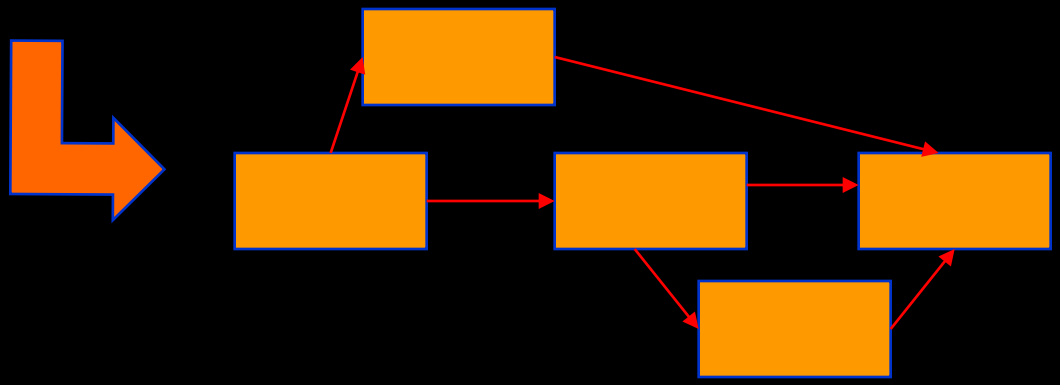
Float = LF - ES - duration

What is it in this case?

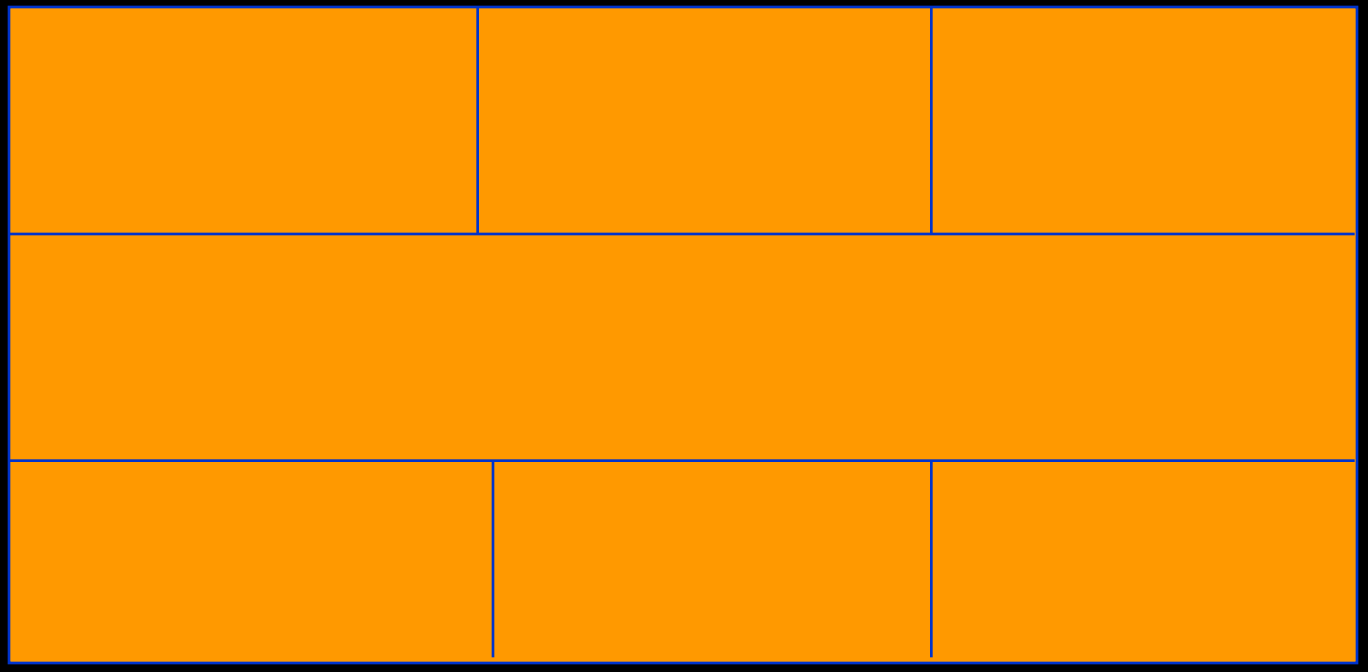
‘Day 0’

- Note that in the last example, day numbers used rather than actual dates
- Makes initial calculations easier – not concerned with week-ends and public holidays
- For **finish** date/times Day 1 means at the END of Day 1.
- For a **start** date/time Day 1 also means at the END of Day 1.
- The first activity therefore begin at Day 0 i.e. the end of Day 0 i.e. the start of Day 1

Earliest start	Duration	Earliest finish
Activity label, activity description		
Latest start	Float	Latest finish

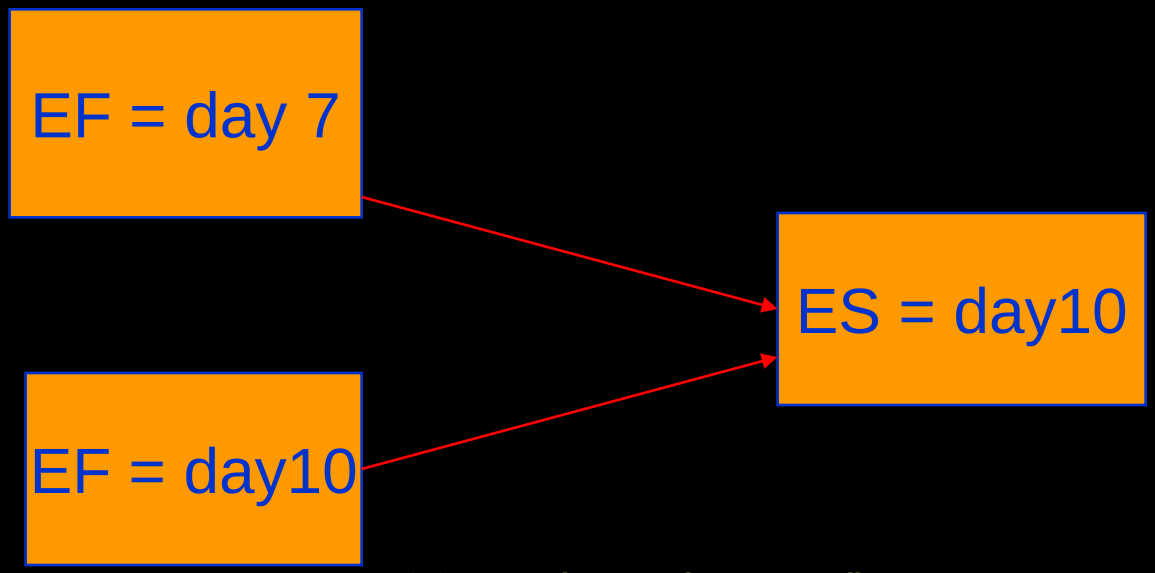


Complete for the previous example

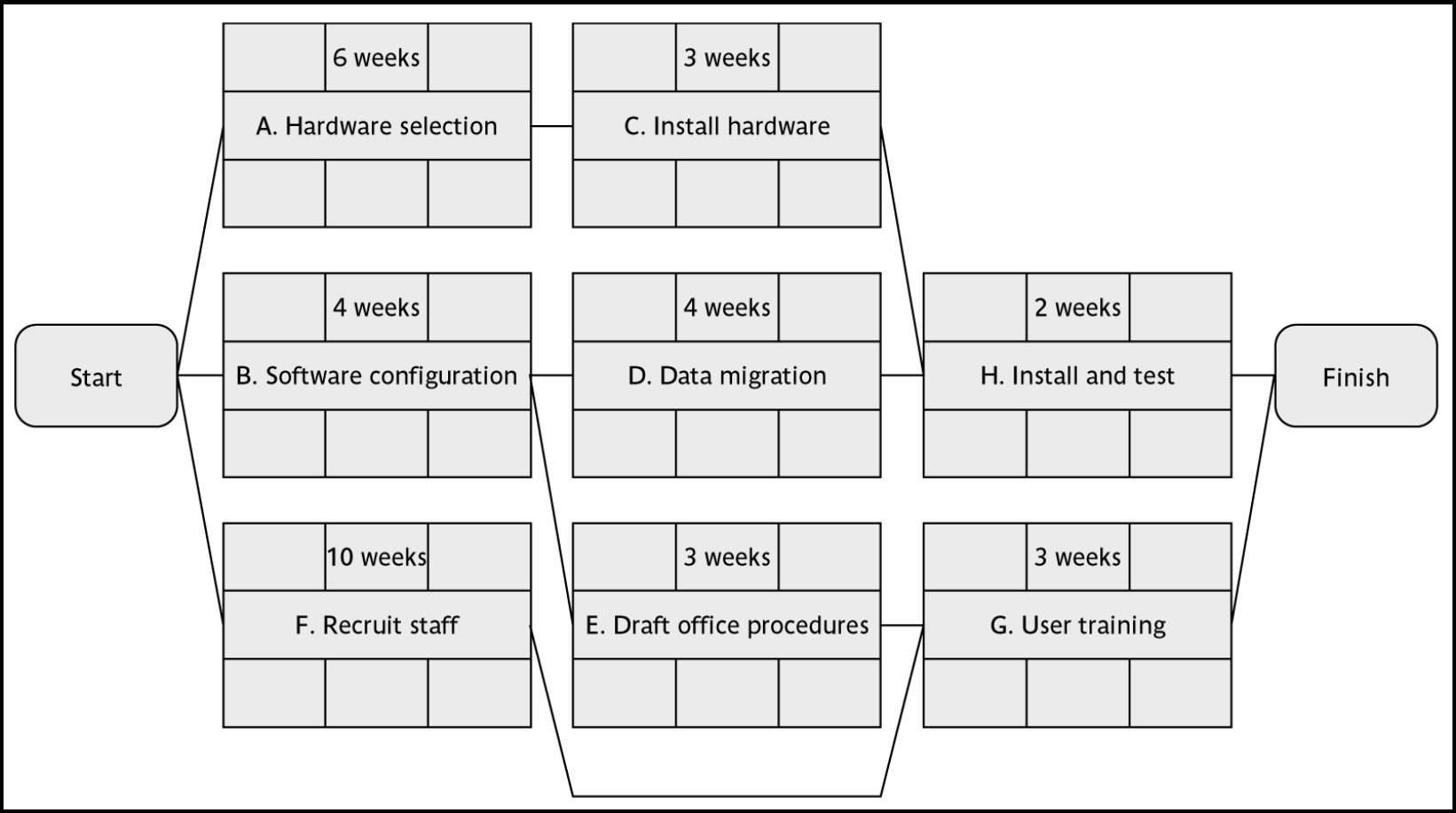


Forward pass

- Start at beginning (Day 0) and work forward following chains.
- Earliest start date for the *current* activity = earliest finish date for the *previous*
- When there is more than one previous activity, take the *latest* earliest finish



Example of an activity network



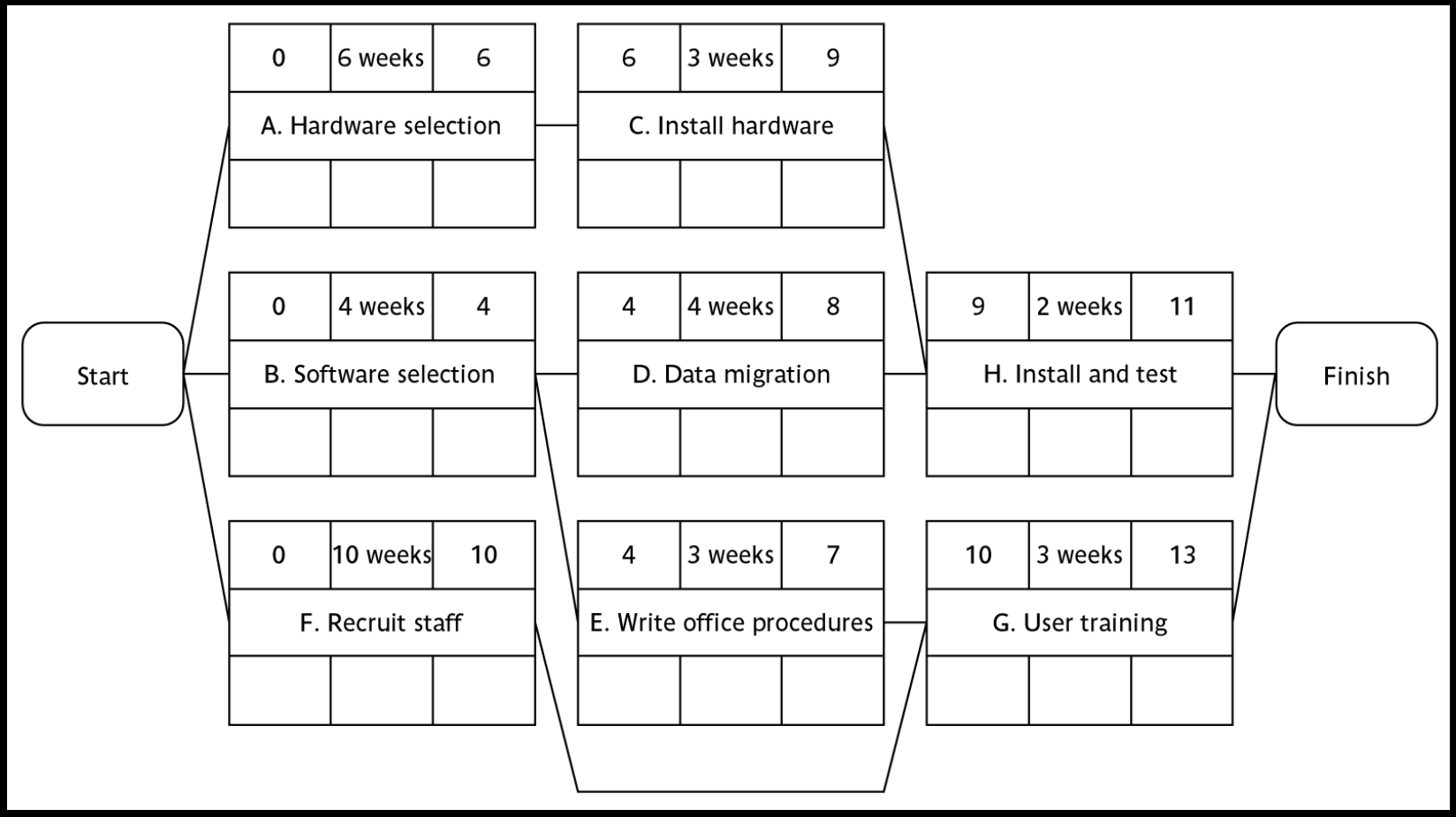
Complete the table

Activity	ES	duration	EF
A			
B			
C			
D			
E			
F			
G			
H			

Backward pass

- Start from the *last* activity
- Latest finish (LF) for last activity = earliest finish (EF)
- work backwards
- Latest finish for *current* activity = Latest start for the *following*
- More than one following activity - take the *earliest* LS
- Latest start (LS) = LF for activity - duration

Example: LS for all activities?

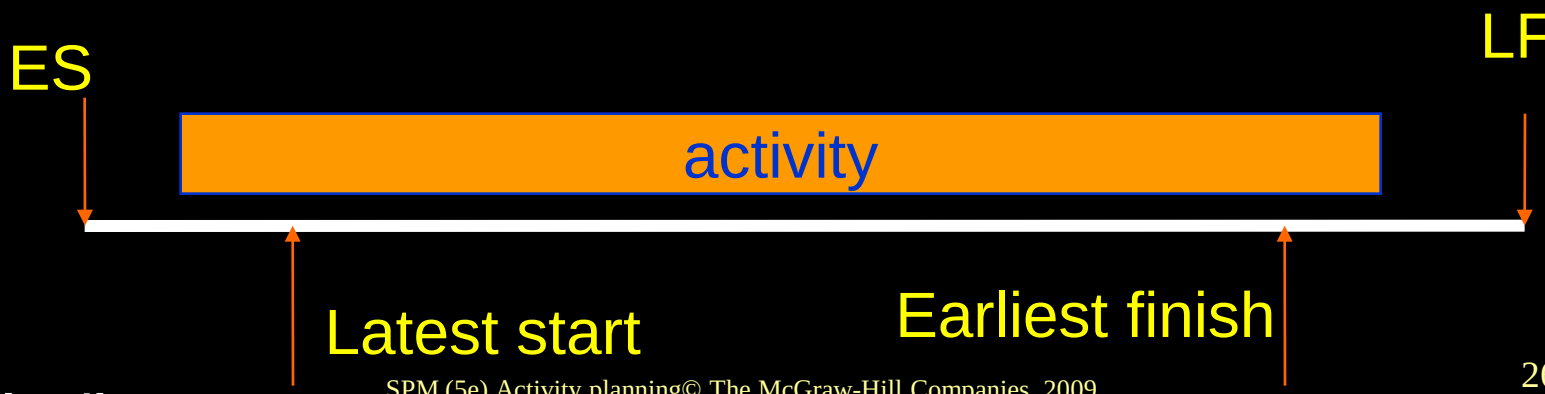


Complete the table

Activity	ES	Dur	EF	LS	LF
A					
B					
C					
D					
E					
F					
G					
H					

Float

Float = Latest finish - Earliest start - Duration



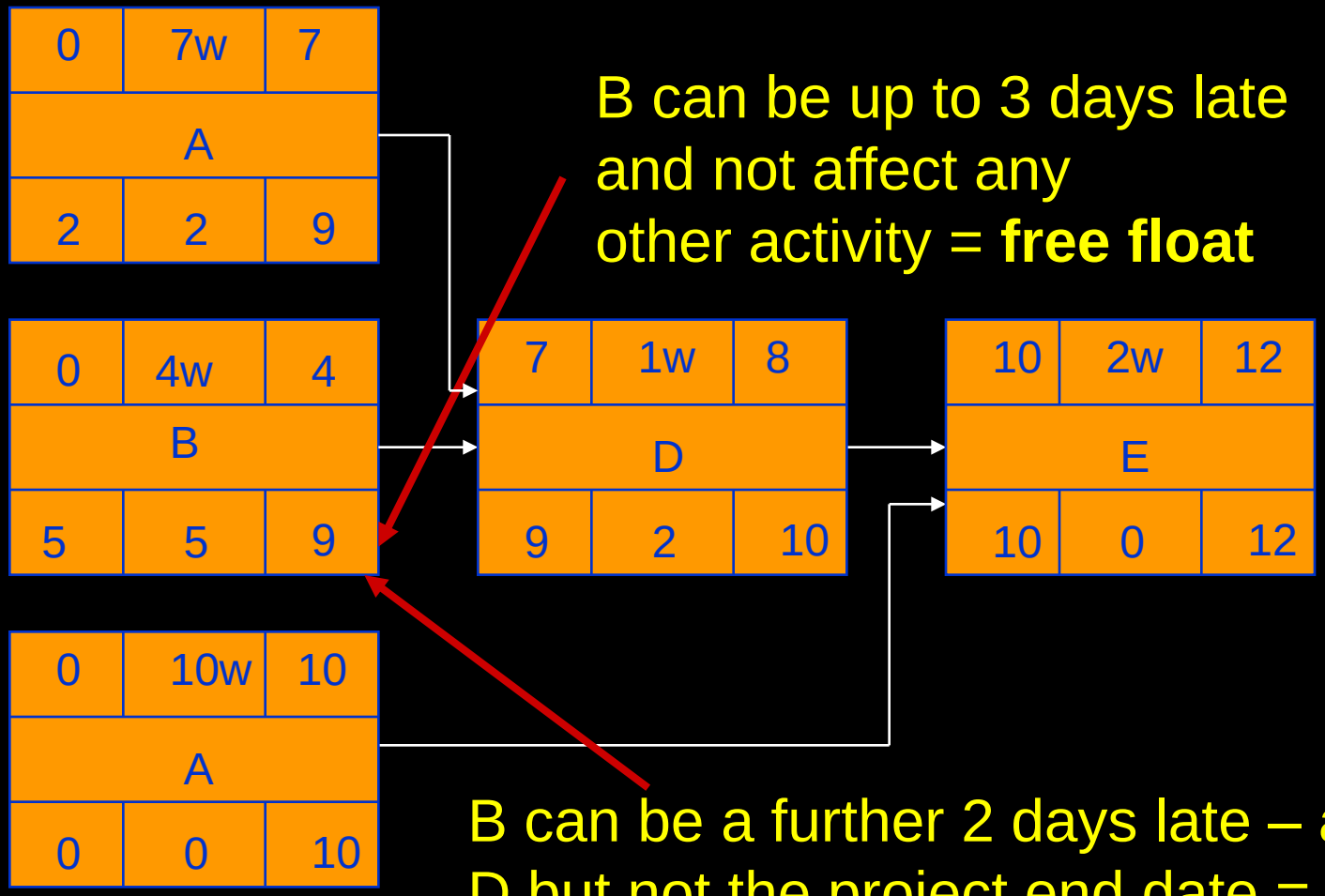
Complete the table

Act-ivity	ES	Dur	EF	LS	LF	Float
A						
B						
C						
D						
E						
F						
G						

Critical path

- Note the path through network with zero floats
- Critical path: any delay in an activity on this path will delay whole project
- Can there be more than one critical path?
- Can there be no critical path?
- Sub-critical paths

Free and interfering float



Network planning models

- Model project activities and their relationships as a network
- Techniques used are
- PERT and CPM
- both techniques used activity on arrow approach to visualizing the project as network