

Project Management

Activity Planning

Scheduling

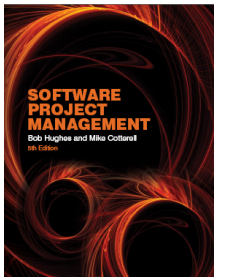
- Having
 - worked out a method of doing the project
 - identified the tasks to be carried
 - assessed the time needed to do each task
- need to allocate dates/times for the start and end of each activity

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

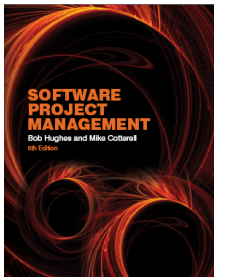
This helps the coordination and motivation of the project team.

Defining activities



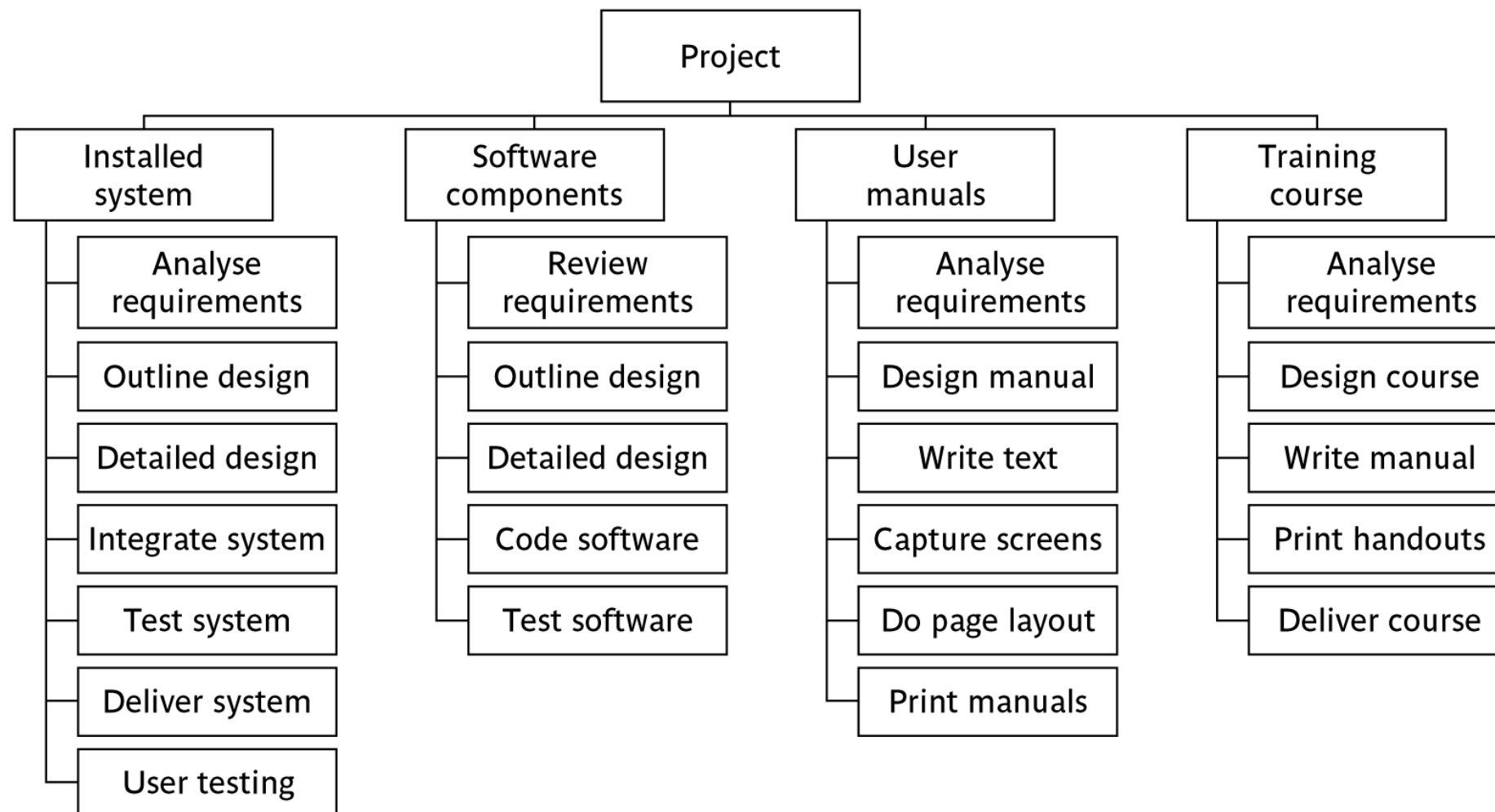
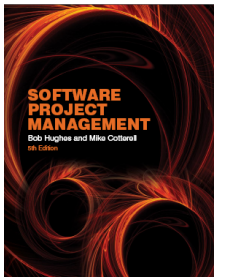
- Activity networks are based on some assumptions:
 - A project is:
 - Composed of a number of activities
 - May start when at least one of its activities is ready to start
 - Completed when all its activities are completed
 - An activity
 - Must have clearly defined start and end-points
 - Must have 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



Final outcome of planning

Task: Person \ Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13
A: Andy	■												
B: Andy		■											
C: Andy			■										
D: Andy				■									
E: Bill			■	■	■	■							
F: Bill						■	■	■	■				
G: Charlie				■	■	■	■	■					
H: Charlie									■	■			
I: Dave										■	■	■	■

Activity key

A: Overall design
B: Specify module 1
C: Specify module 2
D: Specify module 3
E: Code module 1

F: Code module 3
G: Code module 2
H: Integration testing
I: System testing

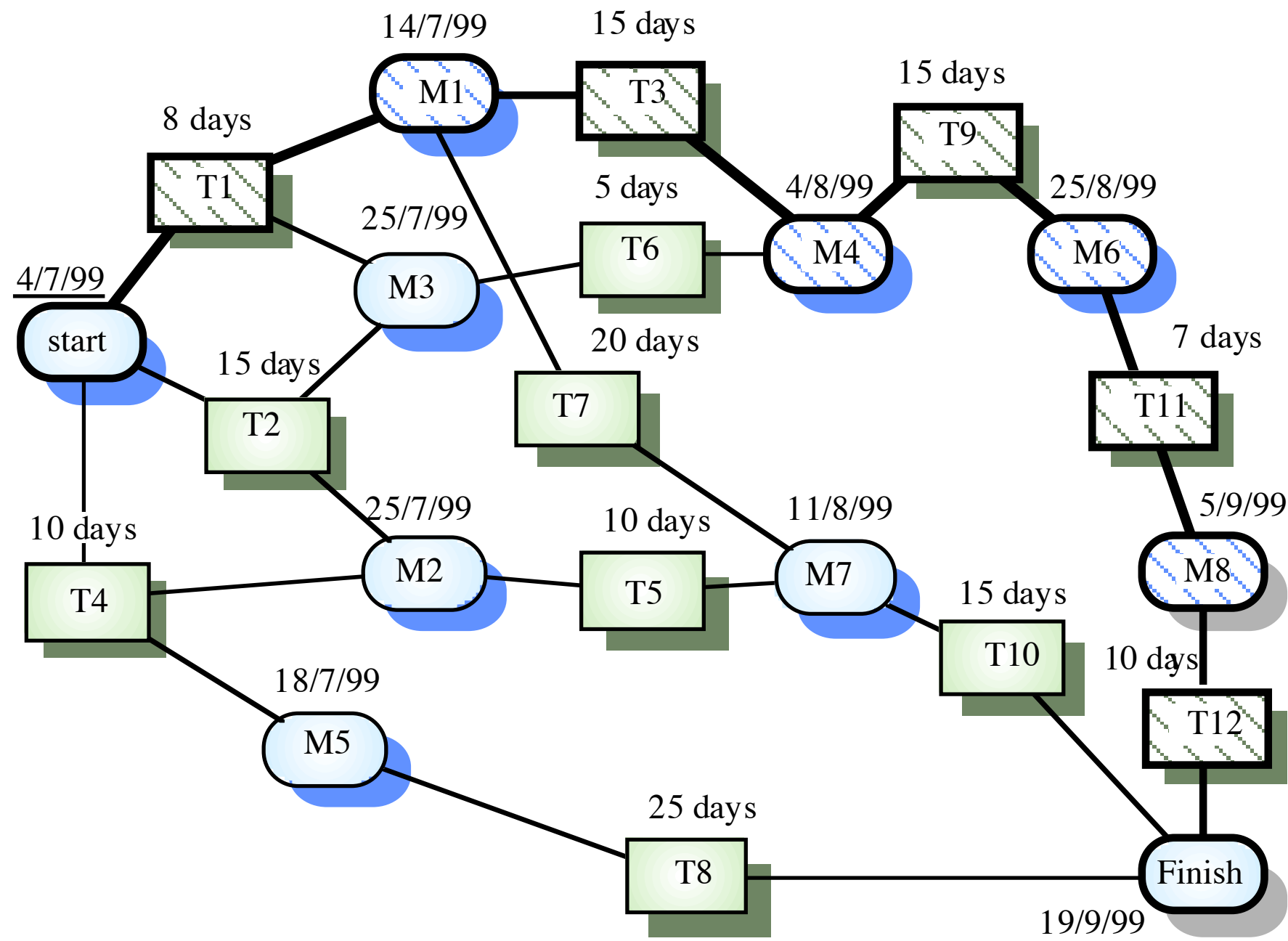
project plan as a bar chart

Example: Task Durations and Dependencies

What is the minimum total duration of this project?

Task	Duration (days)	Dependencies
T1	8	
T2	15	
T3	15	T1
T4	10	
T5	10	T2,T4
T6	5	T1,T2
T7	20	T1
T8	25	T4
T9	15	T3,T6
T10	15	T5,T7
T11	7	T9
T12	10	T11

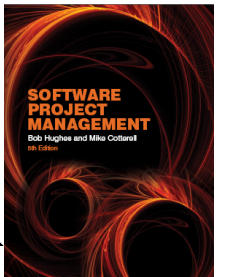
Pert Chart: Activity Network



55 days on the critical path (8+15+15+7+10)

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Formulating an network

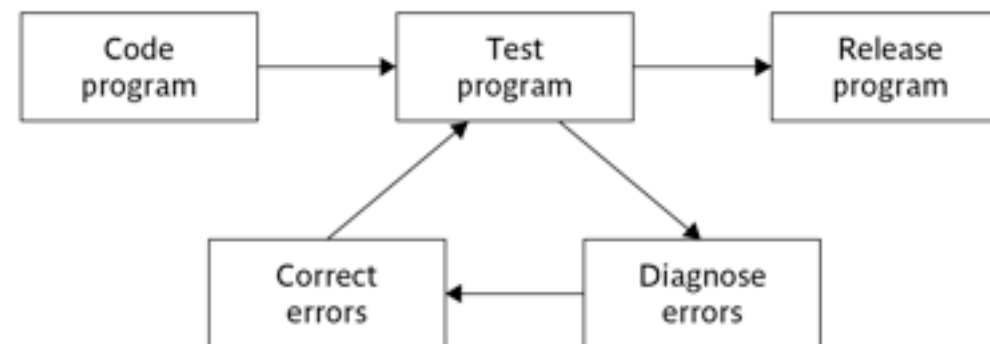


- constructing activity-on-node, some rules:
 - only one start node in a network
 - only one end node in a network
 - node has duration
 - links have no duration
 - time moves from left to right

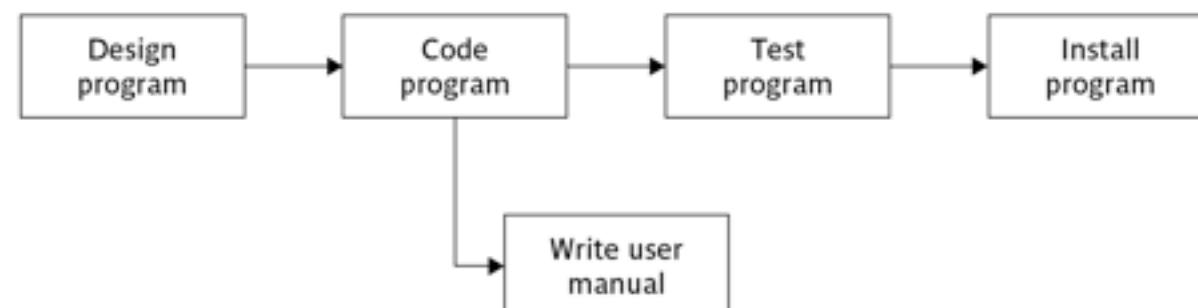
Formulating an network



- precedents are the immediate preceding activities



- network may not contain loops
- network should not contain dangles



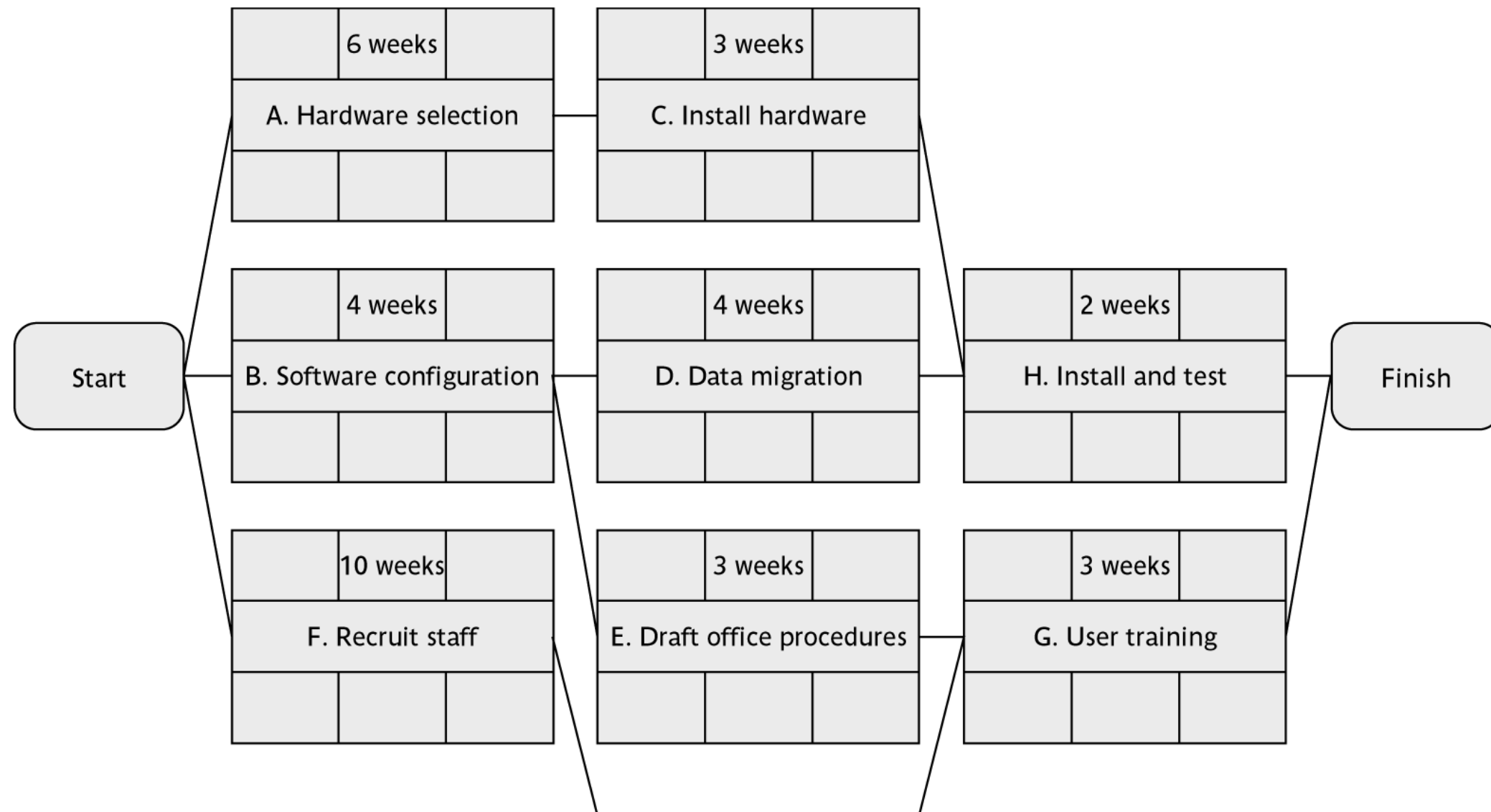
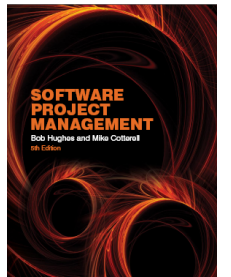
Labeling Convention

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

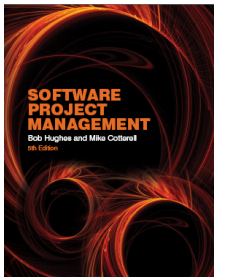
Example

Activity		Duration	Precedents
A	hardware selection	6	
B	software configuration	4	
C	install hardware	3	A
D	data migration	4	B
E	draft office procedures	3	B
F	recruit staff	10	
G	user training	3	E, F
H	install and test system	2	C, D

Example

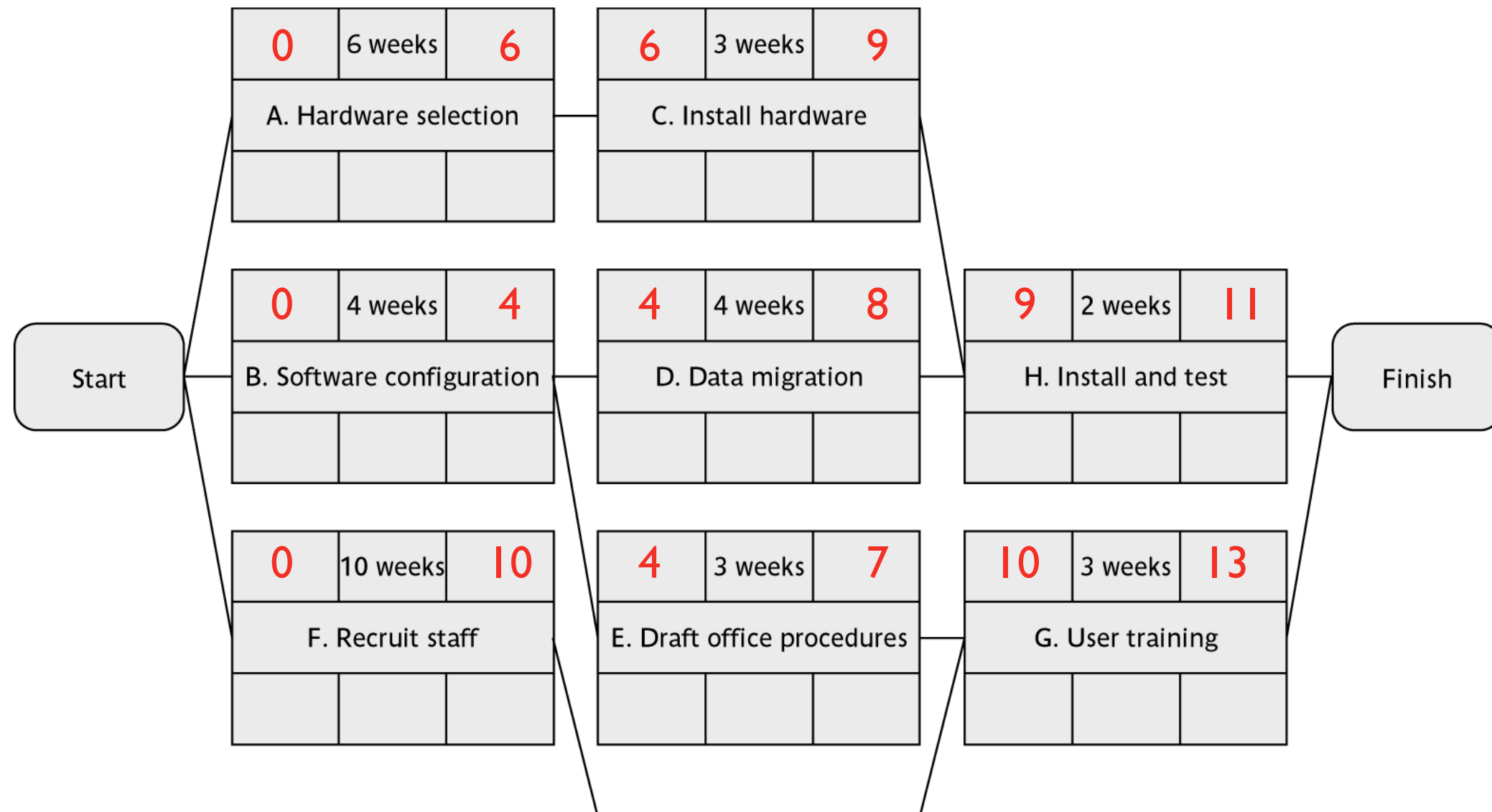
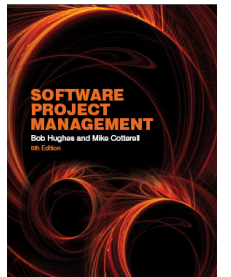


Forward pass

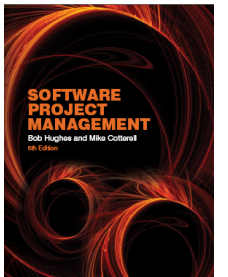


- Start at beginning (Day 0) and work forward following chains.
- Earliest start date for the current activity = earliest finish date for the previous
- When there is more than one previous activity, take the latest earliest finish

Example: forward pass

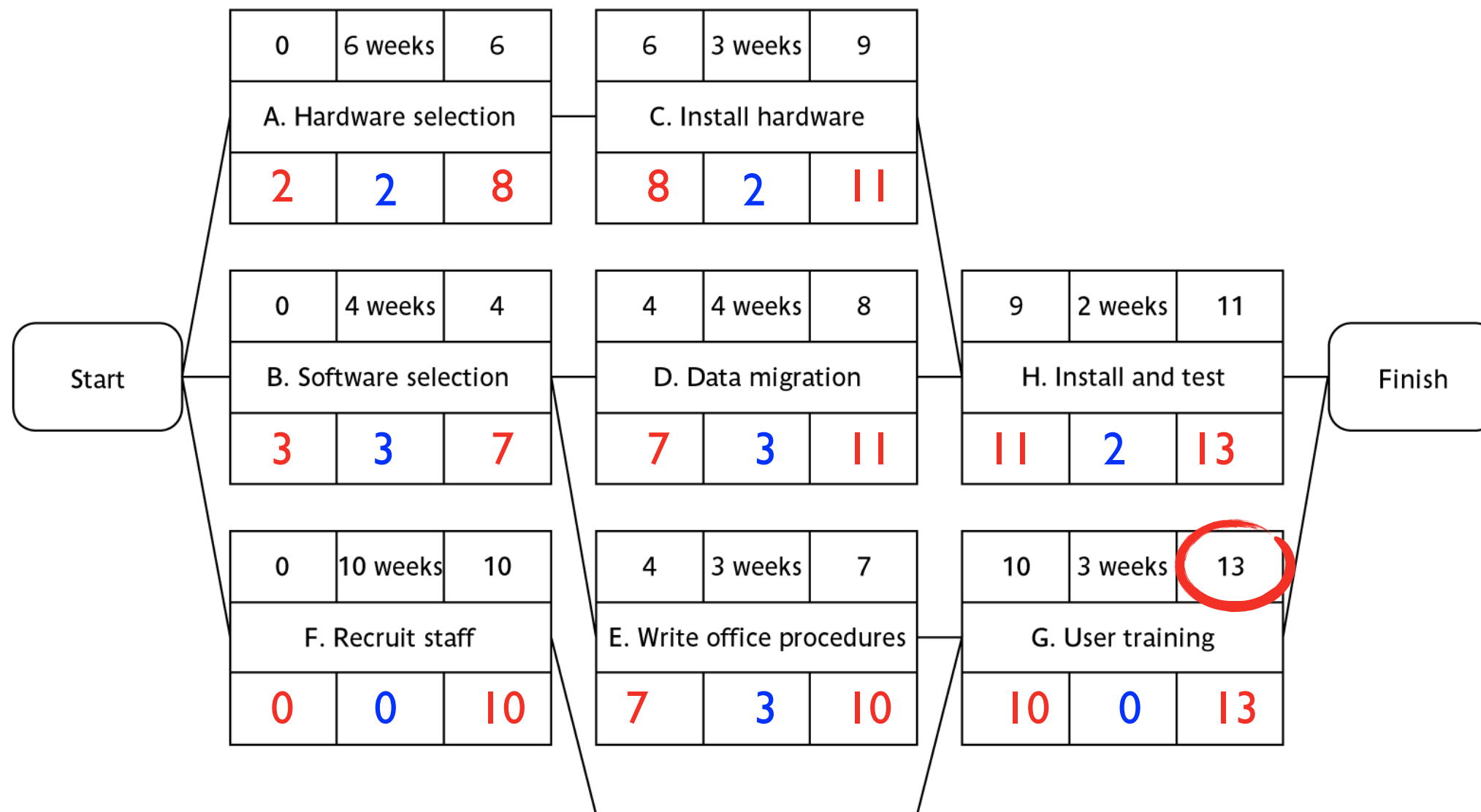
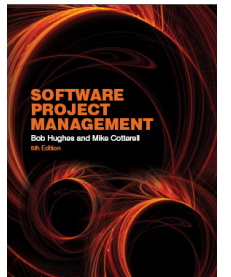


Backward pass



- 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

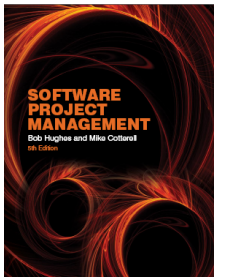
Example: backward pass



Float = LS - ES or LF - EF

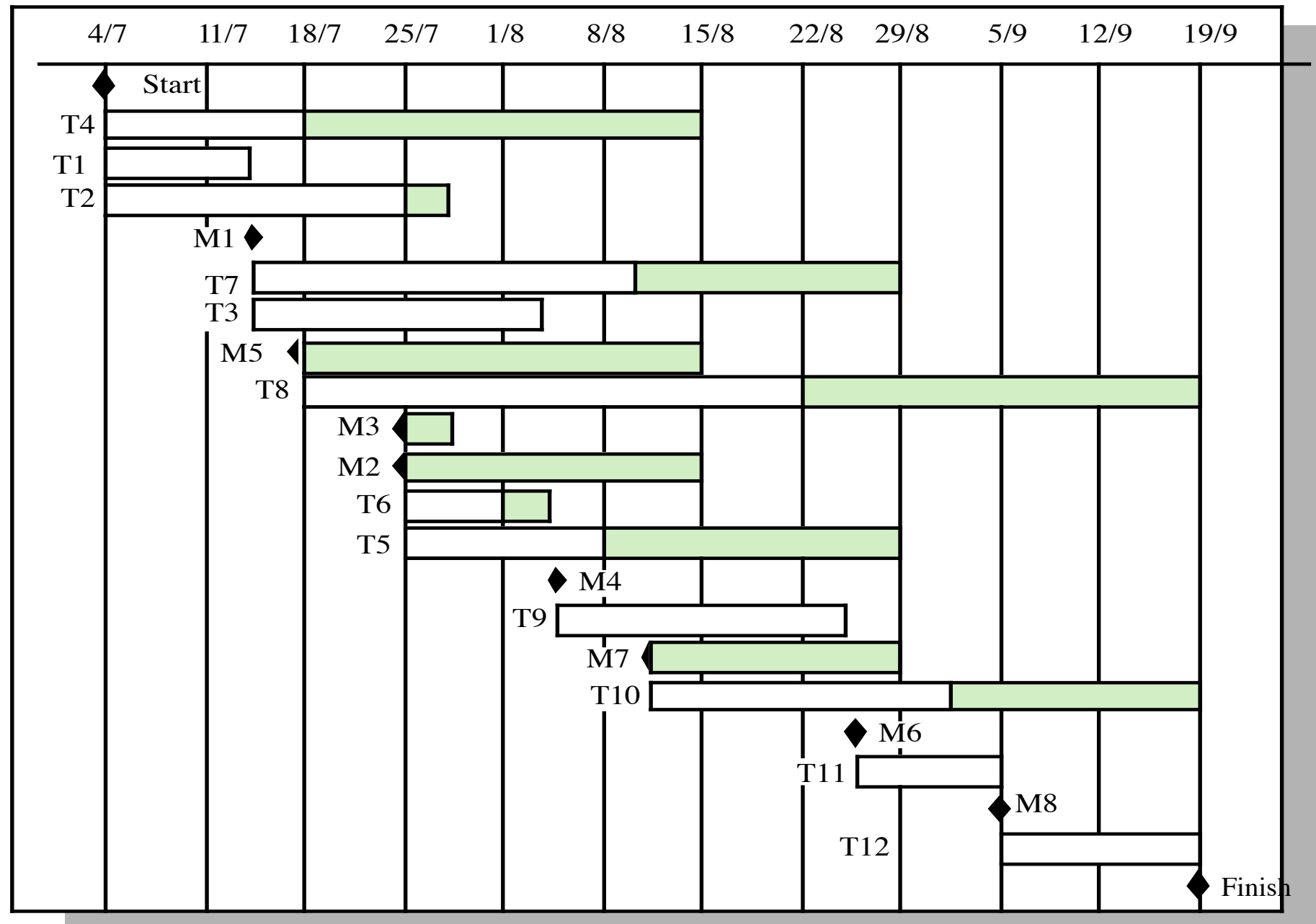
measure of how much the start or completion of an activity may be delayed without affecting end date of project

Critical path



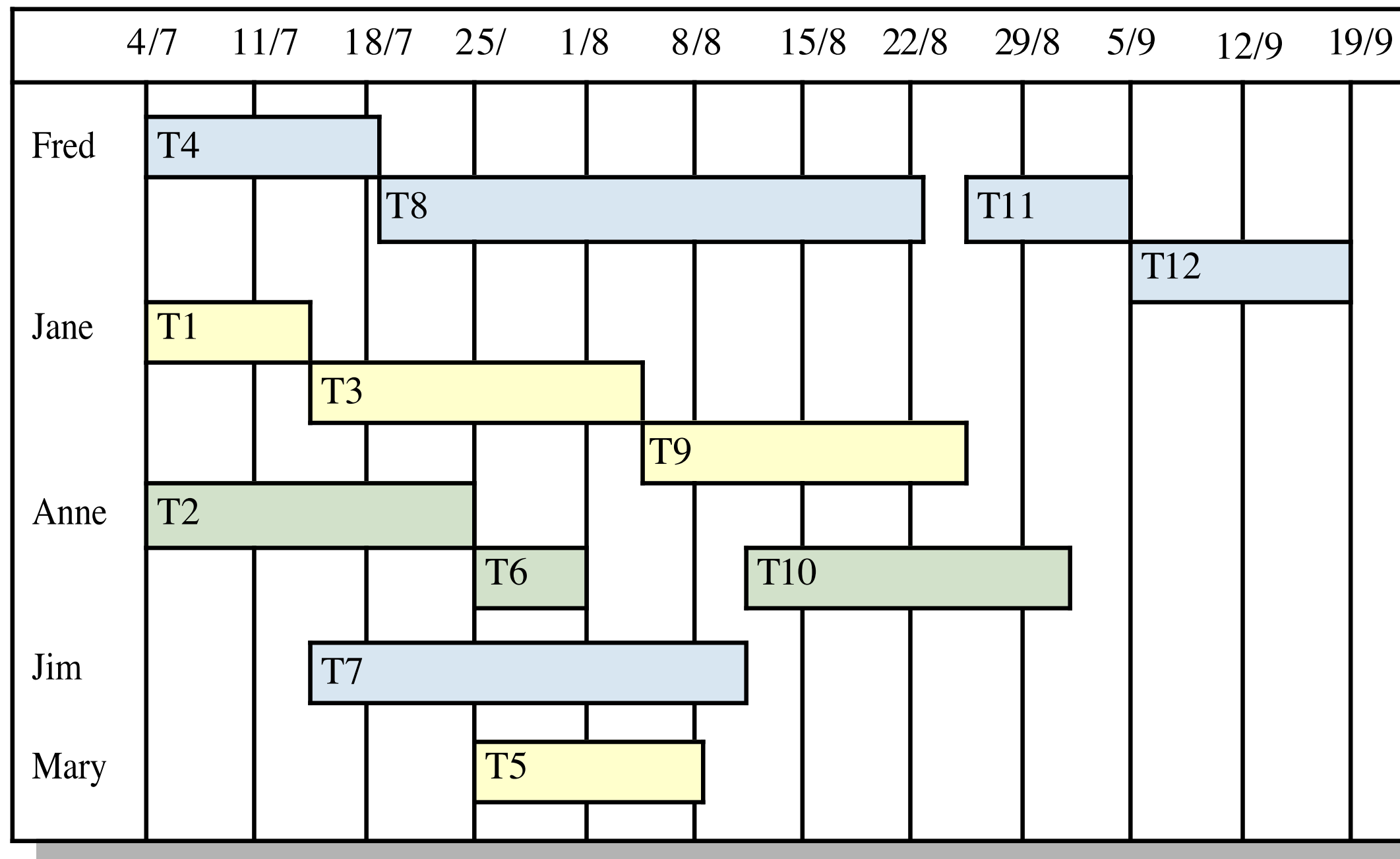
- Note the path through network with zero floats
- Critical path: any delay in an activity on this path will delay whole project
- Can there be more than one critical path?
- Can there be no critical path?
- Sub-critical paths

Gantt Chart: Activity Timeline



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Gantt Chart: Staff Allocation



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