Resource Management

Chapter 12

Types of Constraints

- Technical
- Physical
- Resource
- Time
- Mixed

Resource Loading

The amounts of individual resources that a schedule requires during specific time periods.

Resource loading table

Resource Name	Work	Details	5/5	5/12	5/19	5/26
Bob	40 hrs	Work	8h	32h		
Assign Bids	*40 hrs*	Work	8h	32h		
Carol	40 hrs	Work		8h	32h	
Calculate Cost	*40 hrs*	Work		8h	32h	
Ted	40 hrs	Work		8h	32h	
Documentation	*40 hrs*	Work		8h	32h	
Alice	8 hrs	Work				8h
Select Bid	*8 hrs*	Work				8h

Resource Leveling (Smoothing)

A ***multivariate***, ***combinatorial*** problem

Objectives

- To determine the resource requirements so that they will be available at the right time
- To allow each activity to be scheduled with the smoothest possible transition across resource usage levels

Prioritization Rules for Leveling

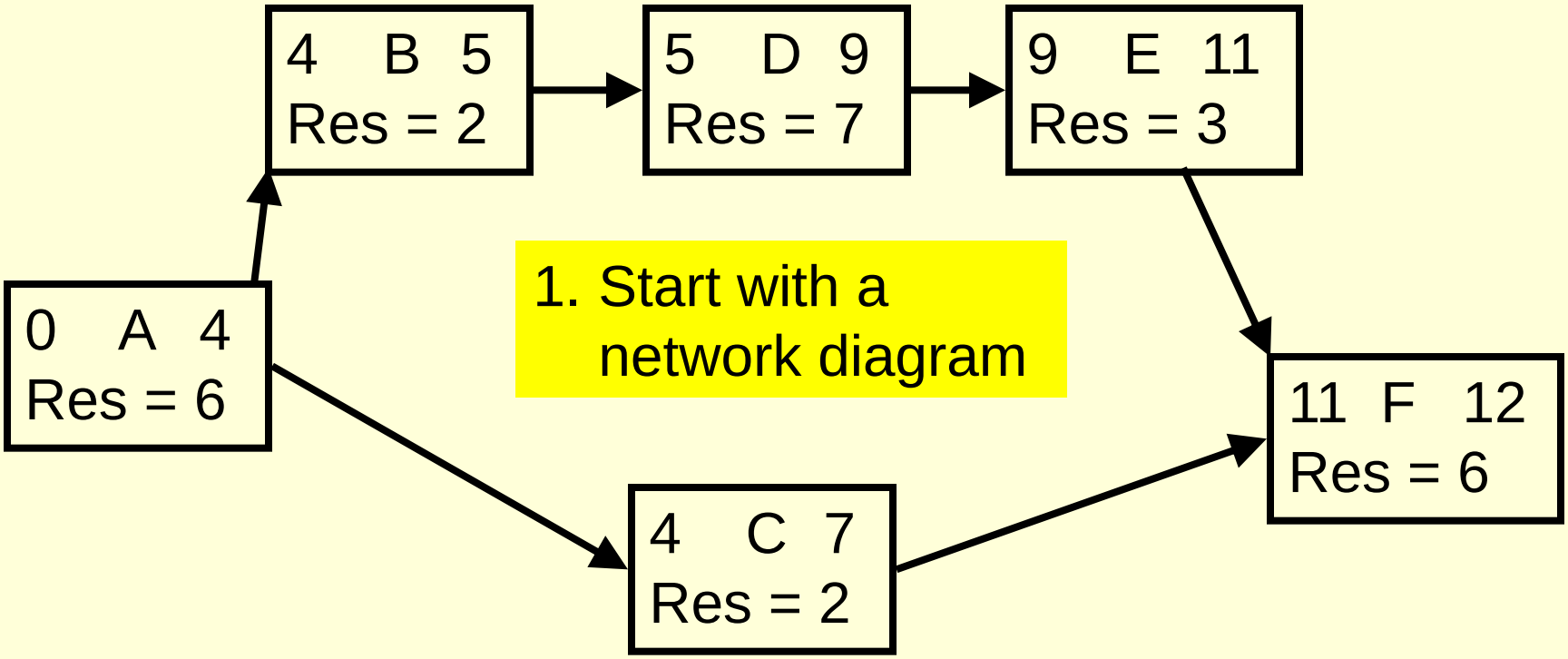
- Smallest amount of slack
- Smallest duration
- Lowest ID number (FCFS)
- Greatest number of successor tasks
- Requiring the most resources

General Procedure for Leveling

1. Create a project activity **network diagram**
2. Develop resource **loading table**
3. Determine activity **late finish** dates
4. Identify resource **over allocation**
5. Resource **level** the loading table

Creating Resource Loading Charts

Display the amount of resources required as a function of time.



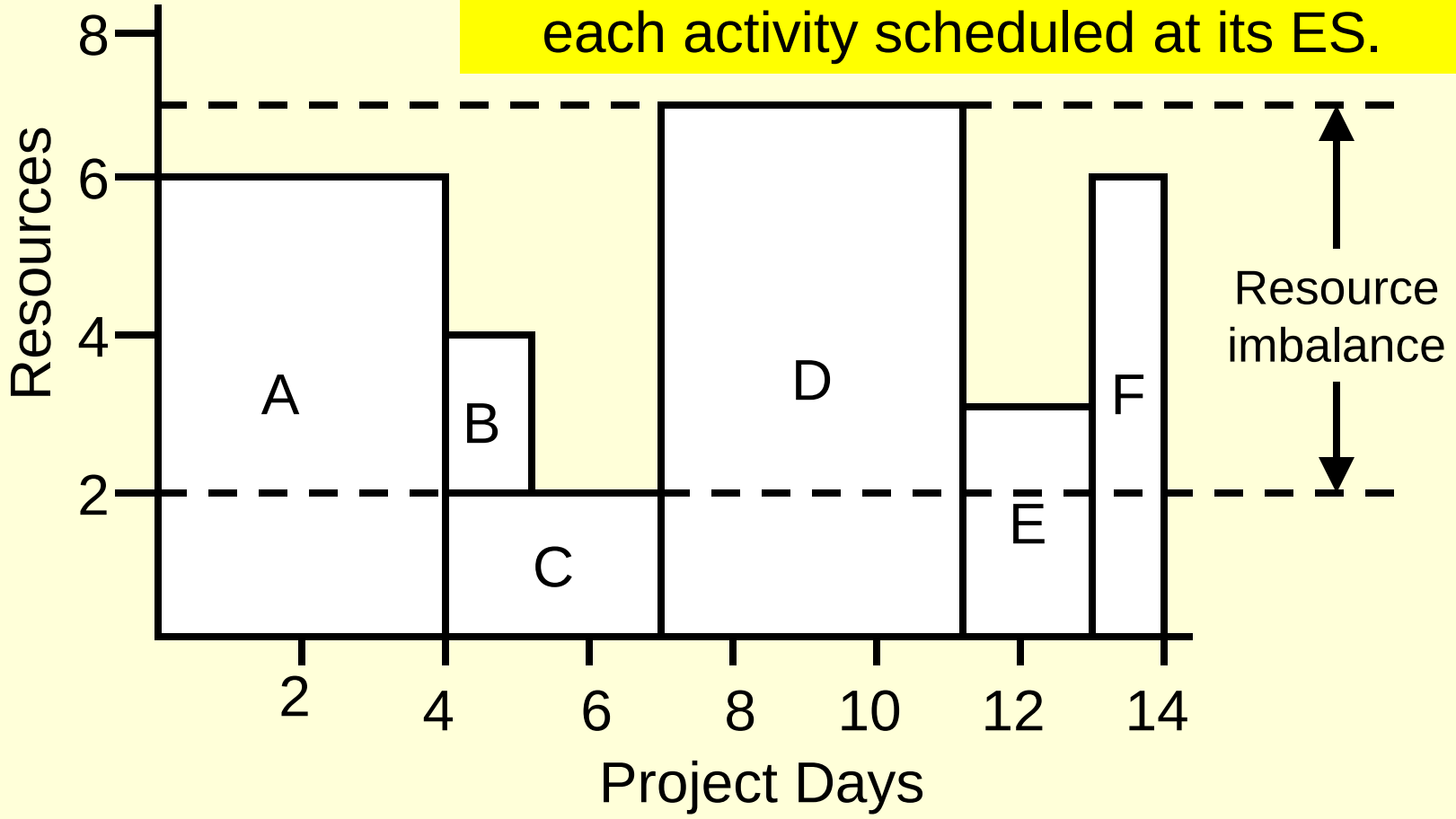
Creating Resource Loading Charts

Activity	Resource	Duration	ES	Slack	LF
A	6	4	0	0	4
B	2	1	4	0	5
C	2	3	4	4	11
D	7	4	5	0	9
E	3	2	9	0	11
F	6	1	11	0	12

2. Produce a table that shows the duration, early start, late finish, slack, and resource(s) required for each activity.

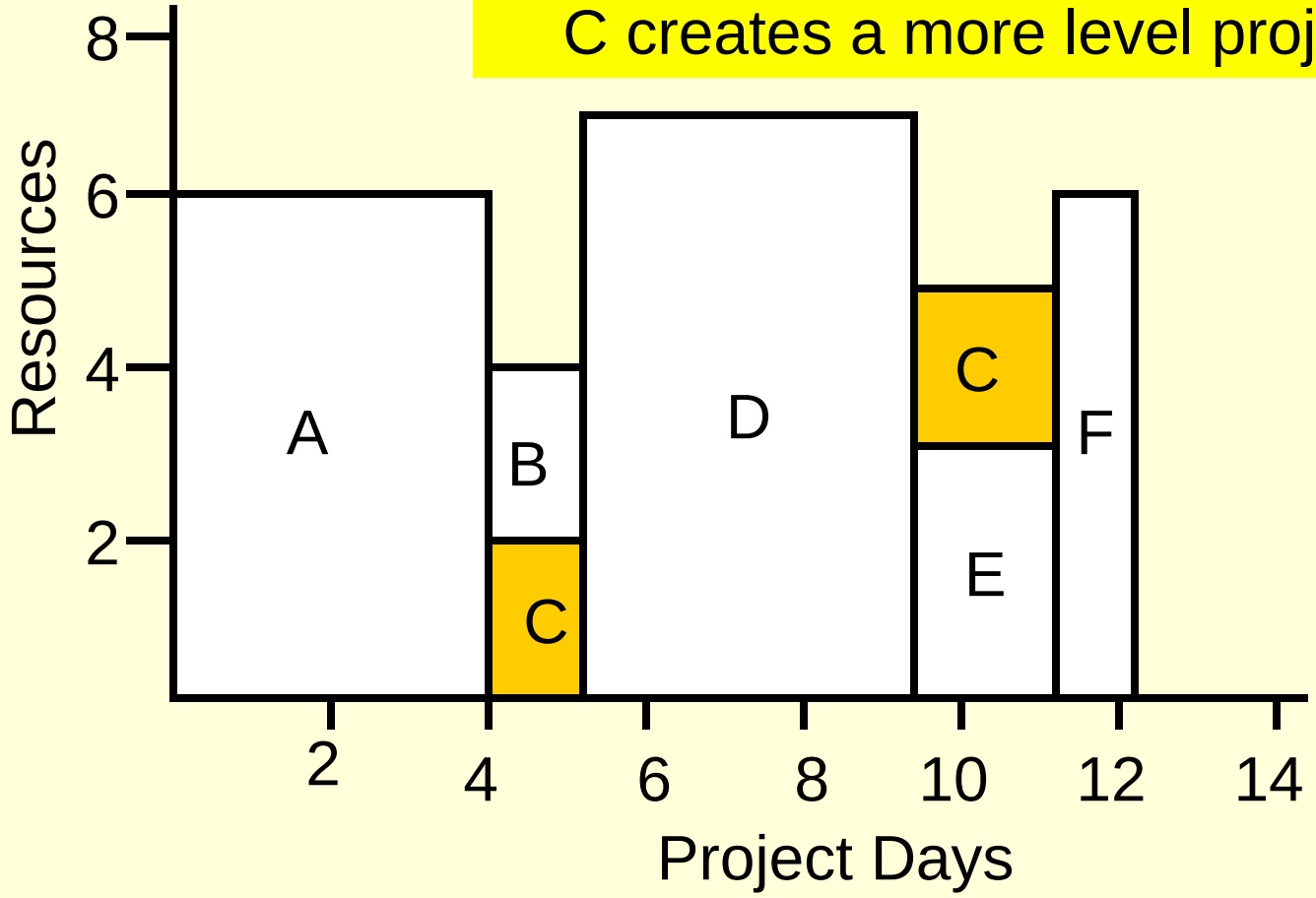
Creating Resource Loading Charts

3. Draw an initial loading chart with each activity scheduled at its ES.



Creating Resource Loading Charts

4. Rearrange activities within their slack to create a more level profile. Splitting C creates a more level project.



Key Parameters in Multi-Project Environments

- Schedule slippage
- Resource utilization
- In-process inventory

Prioritizing Resource Allocations in Multi-Project Environments

- **First come** first served
- Greatest resource **demand**
- Greatest resource **utilization**
- Minimum **late finish** time
- **Mathematical programming**