PROJECT MANAGEMENT via NETWORKS

This Hypercard stack was prepared by:
Dennis L. Bricker,
Dept. of Industrial Engineering,
University of Iowa,
Iowa City, Iowa 52242
e-mail: dbricker@icaen.uiowa.edu

Project:

a set of complex interrelated tasks directed toward the accomplishment of an objective

Project Management

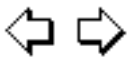
A system of procedures which provides for

- planning
- scheduling
- control

of a project

Important characteristics of Project Management

- forces detailed planning
- improves communications
- identifies potential problem areas
- provides management with timely progress reports
- offers ability to simulate effects of alternate decisions
- assists in long-range planning



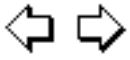
Network Models of a Project

AOA: Activity on Arrow model

the tasks (activities) are represented by arcs (arrows) in the network

AON: Activity on Node model

the tasks (activities) are represented by the nodes in the network

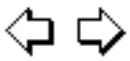


Example

A company is about to introduce a new product (#3). One unit of product #3 is produced by assembling one unit of product #1 and one unit of product #2.

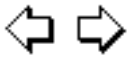
Before production begins on either product #1 or #2, raw materials must be purchased and workers must be trained.

Before products #1&2 can be assembled into product #3, the finished product #2 must be inspected.

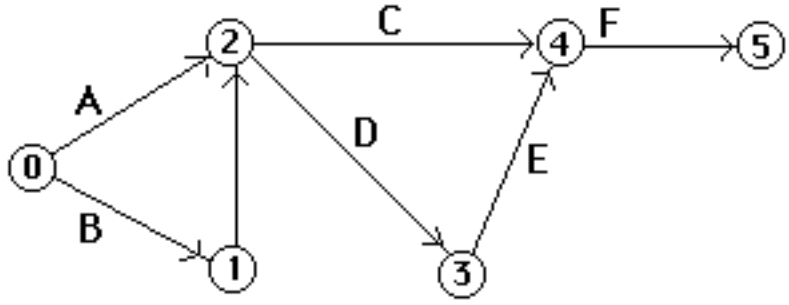


Tasks required for completion of project

task	predecessors	duration (days)
A = train workers	none	6
B = purchase raw mat'ls	none	9
C = produce product #1	A,B	8
D = produce product #2	A,B	7
E = test product #2	D	10
F = assemble product #3	C,E	12

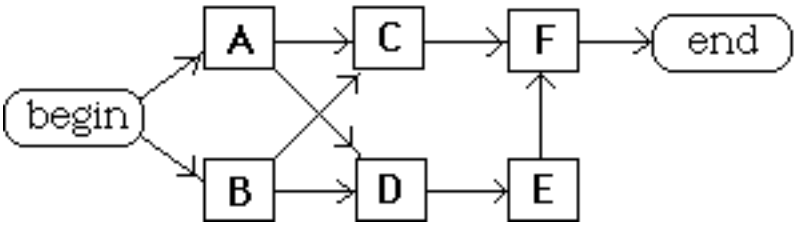


AOA model

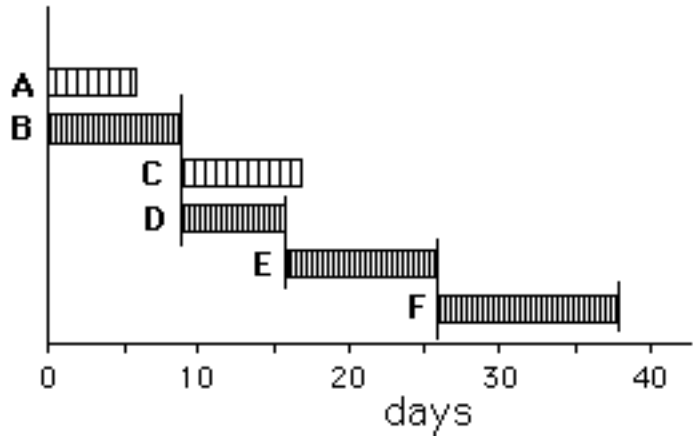


tasks
A=train workers
B=purchase raw materials
C=produce #1
D=produce #2
E=test #2
F=assemble #3

AON model



GANTT Chart



Each activity is represented by a bar, which specifies the beginning and ending of the activity.

What is the shortest time required for the production of product #3?

If the durations are known with certainty, the project completion time can be found using the Critical Path Method (CPM)

If the durations of the tasks are random, the project completion time can be estimated using the Program Evaluation & Review Technique (PERT)

- **CPM** – Critical Path Method
- **PERT** – Program Evaluation & Review Technique
- **SLAM** – Simulation of project
- **"Crashing"** – Reducing project completion time