IIT ROORKEE

NPTEL ONLINE CERTIFICATION COURSE

Project Management for Managers

Lec – 37

Project Time Management – CPM

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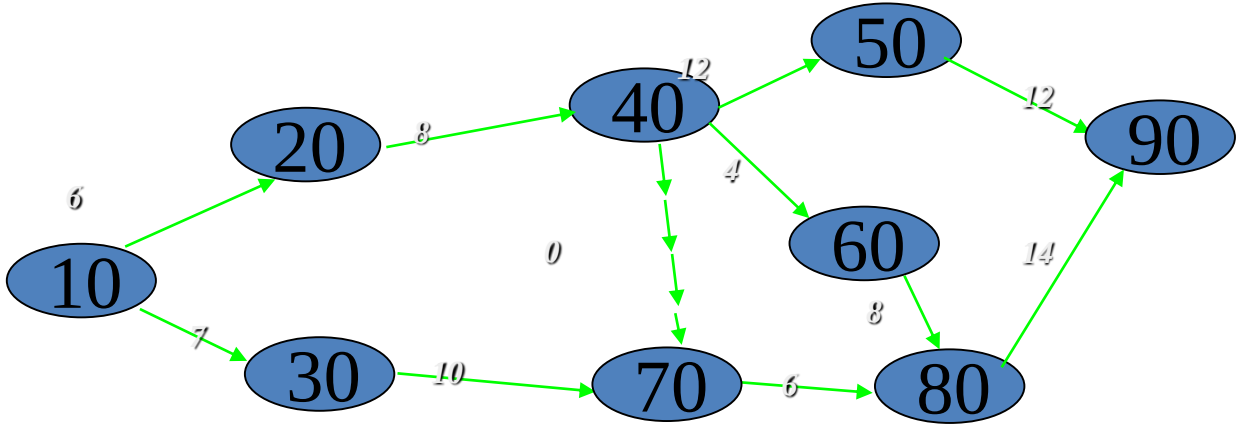
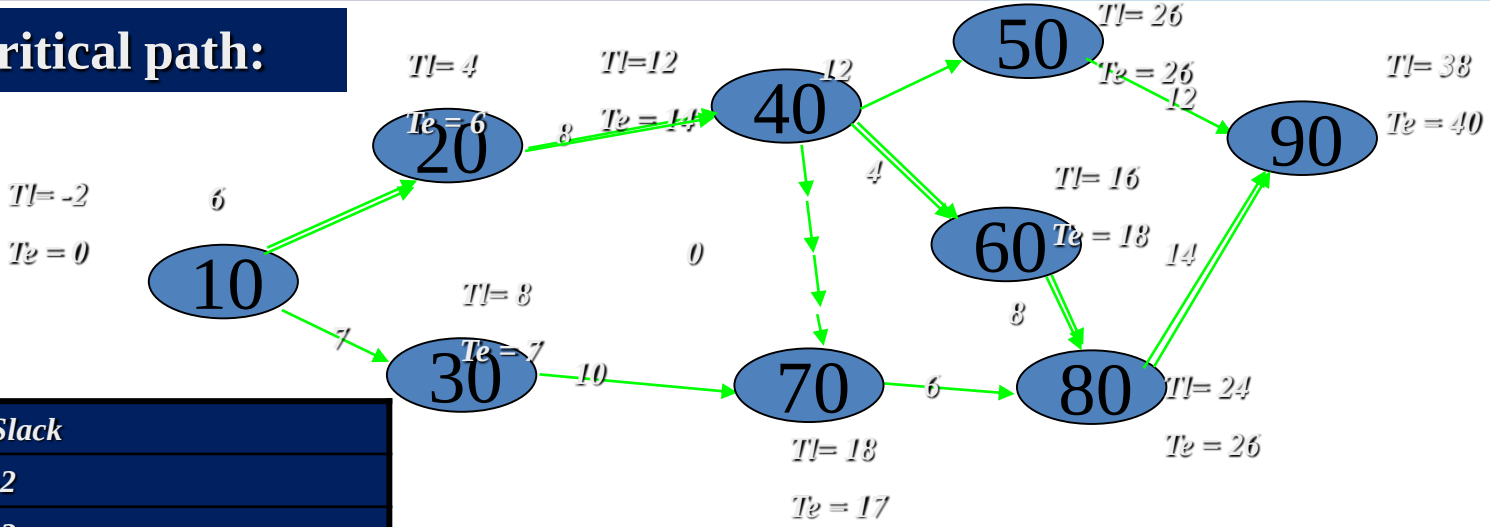
Department of Management

Indian Institute of Technology Roorkee



Find critical and Semi critical paths:

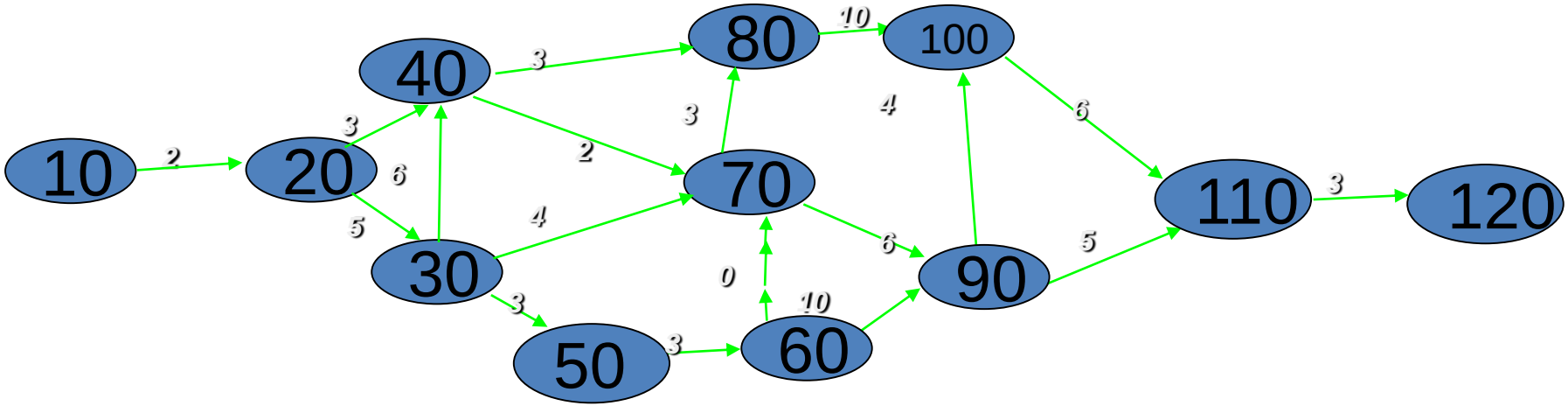
Semi critical path:



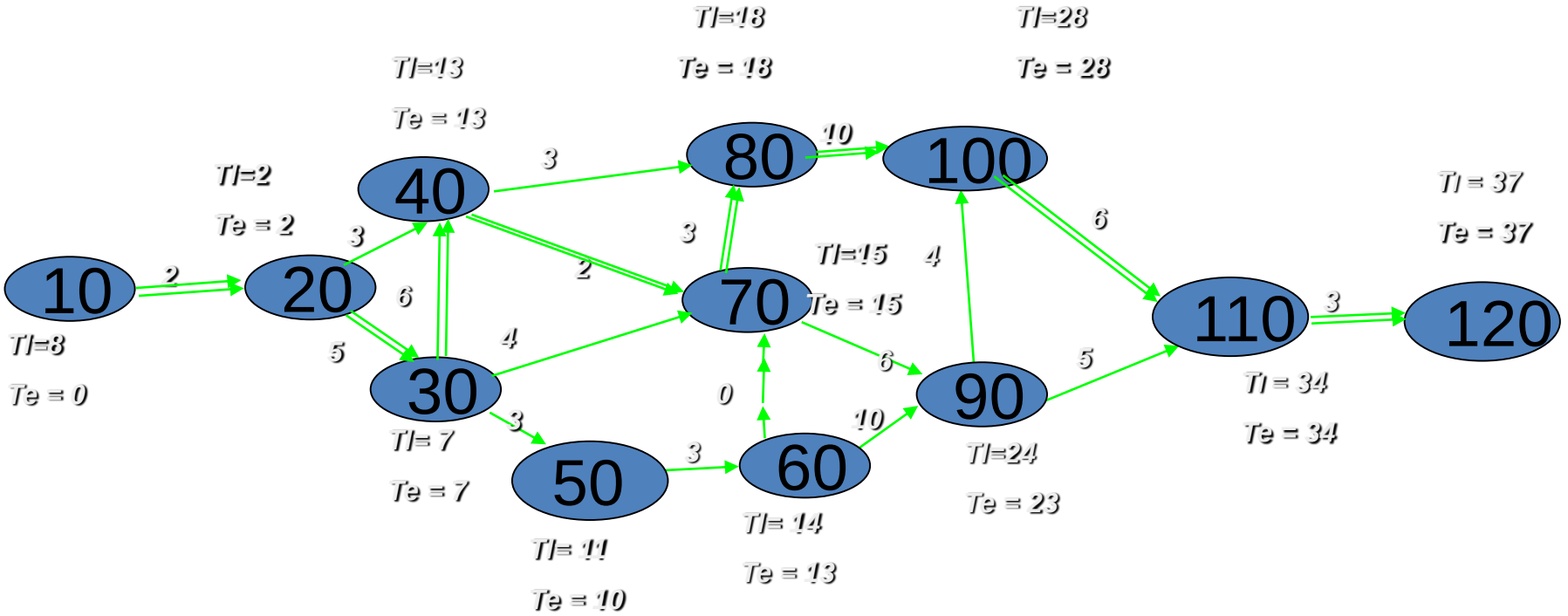
Node	Slack
10	-2
20	-2
30	1
40	-2
50	0
60	-2
70	1
80	-2
90	-2

Semi critical path: *Slack at node 50 is 0, which is connected to node 40 and 90. Semi critical path is 40-50-90.*

The other semi critical path is 30-70



Find critical and semi critical paths??

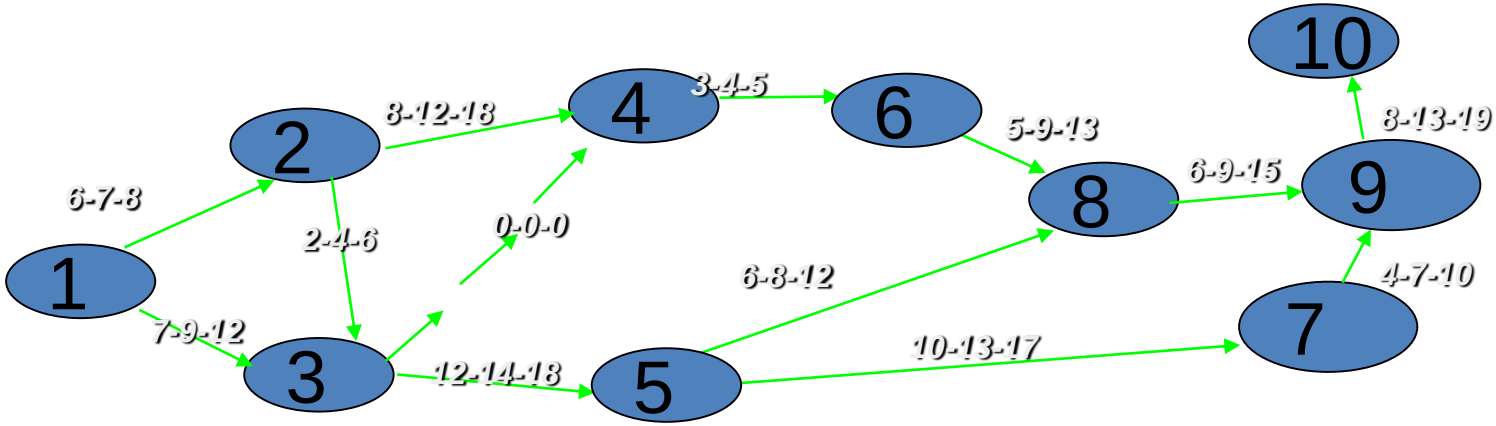

10
Tl=8
Te = 0
2
20
Tl=2
Te = 2
3
6
5
40
Tl=13
Te = 13
3
2
30
Tl= 7
Te = 7
4
3
50
Tl= 11
Te = 10
3
60
Tl= 14
Te = 13
0
3
70
Tl=15
Te = 15
4
6
80
Tl=18
Te = 18
10
90
Tl=24
Te = 23
10
100
Tl=28
Te = 28
6
5
110
Tl = 34
Te = 34
3
120
Tl = 37
Te = 37

PERT Network and Time Estimates.

1. The Optimistic Time Estimate:

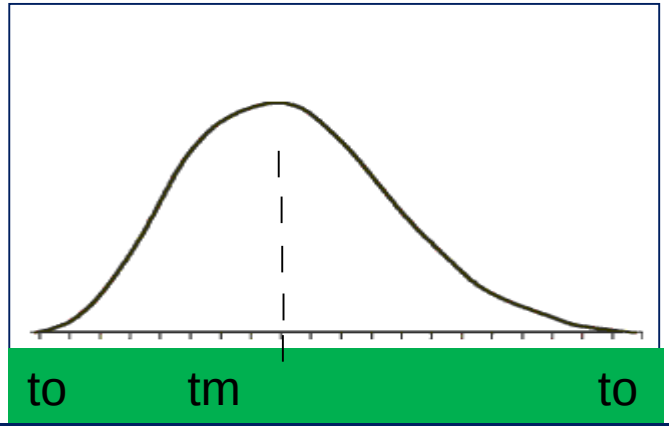
2. The Pessimistic Time Estimate:

3. The Most Likely Time Estimate:



Find critical and semi critical paths??

The Beta Distribution: The PERT analysts have found that the beta distribution curve happened to give fairly satisfactory results for most of the activities. (skewed to right- positively skewed curve- tails off toward high end of the scale)



For distribution of this type, the standard deviation is approximately one-sixth of the range.

$\sigma = (tp-to) / 6$

$(\sigma)^2 = ((tp-to) / 6)^2$

The Beta Distribution:

Consider the time estimates for two persons, x and y , for the execution of a particular job.

	to	tm	tp
Estimate by x	6	8	10
Estimate by y	5	7	11

Who is more uncertain.???????????

The Beta Distribution:

Consider the time estimates for two persons, x and y , for the execution of a particular job.

	to	tm	tp
Estimate by x	6	8	10
Estimate by y	5	7	11

Who is more uncertain.

$(\sigma x)^2 = ((tp - to) / 6)^2 = 0.44$

$(\sigma y)^2 = ((tp - to) / 6)^2 = 1$

EXPECTED TIME OR AVERAGE TIME.

After finding SD and variance, let us find average time taken for completion of a job.

In PERT, average time is called as expected time. There is 50-50 chance of getting the job done within that time.

$$te = 1/6\ (to) + 2/3\ (tm) + 1/6\ (tp)$$

$$= (to+4tm+tp)/\ 6$$

Lags in Precedence Relationships

The logical relationship between the start and finish of one activity and the start and finish of another activity.

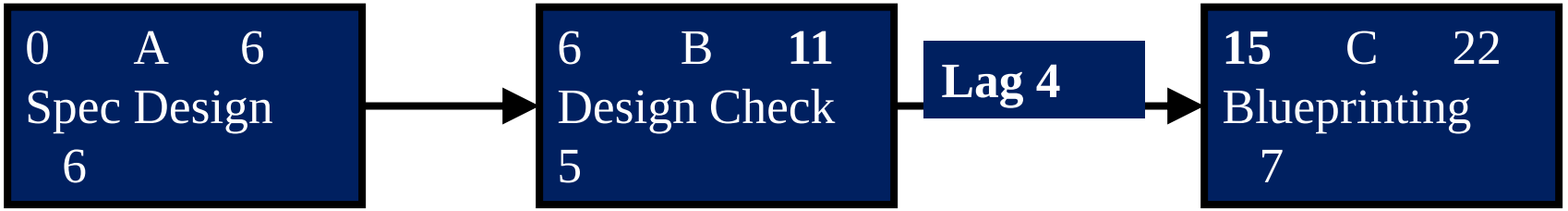
Four logical relationships between tasks

1. Finish to Start
2. Finish to Finish
3. Start to Start
4. Start to Finish

Finish to Start Lag: A **finish to start** lag of 4 days between completion of activity B and the start of activity C, as shown in figure. Three activities (A,B,C), activity C cant be started , as activity B is to be done by external supplier.

- Most common type of sequencing
- Shown on the line joining the nodes
  - Added during forward pass
  - Subtracted during backward pass

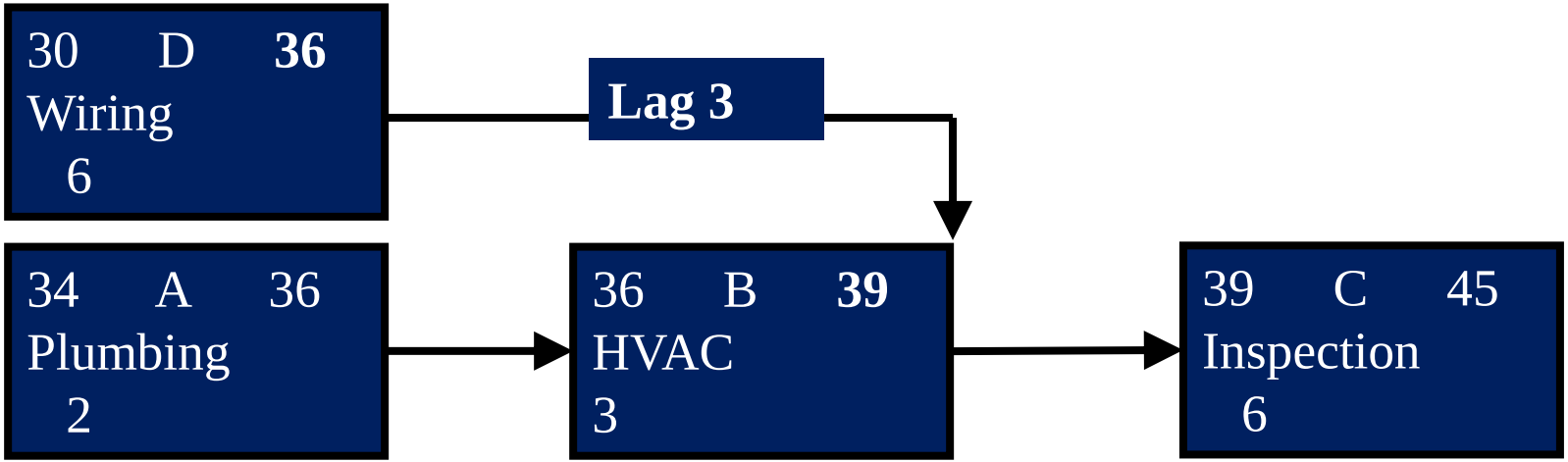
This lag is not the same as activity slack 15-11 =4



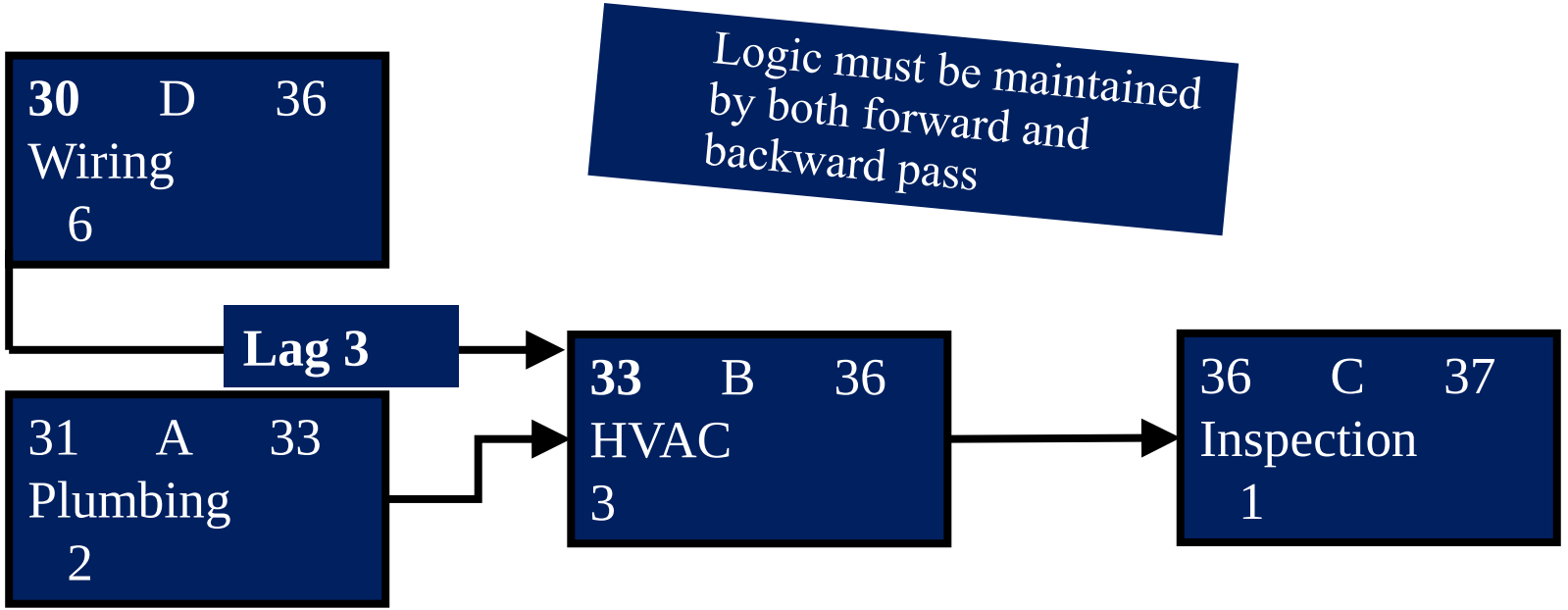
Finish to Finish Lag:

Two activities share a similar completion point

- The mechanical inspection cannot happen until wiring, plumbing, and HVAC installation are complete

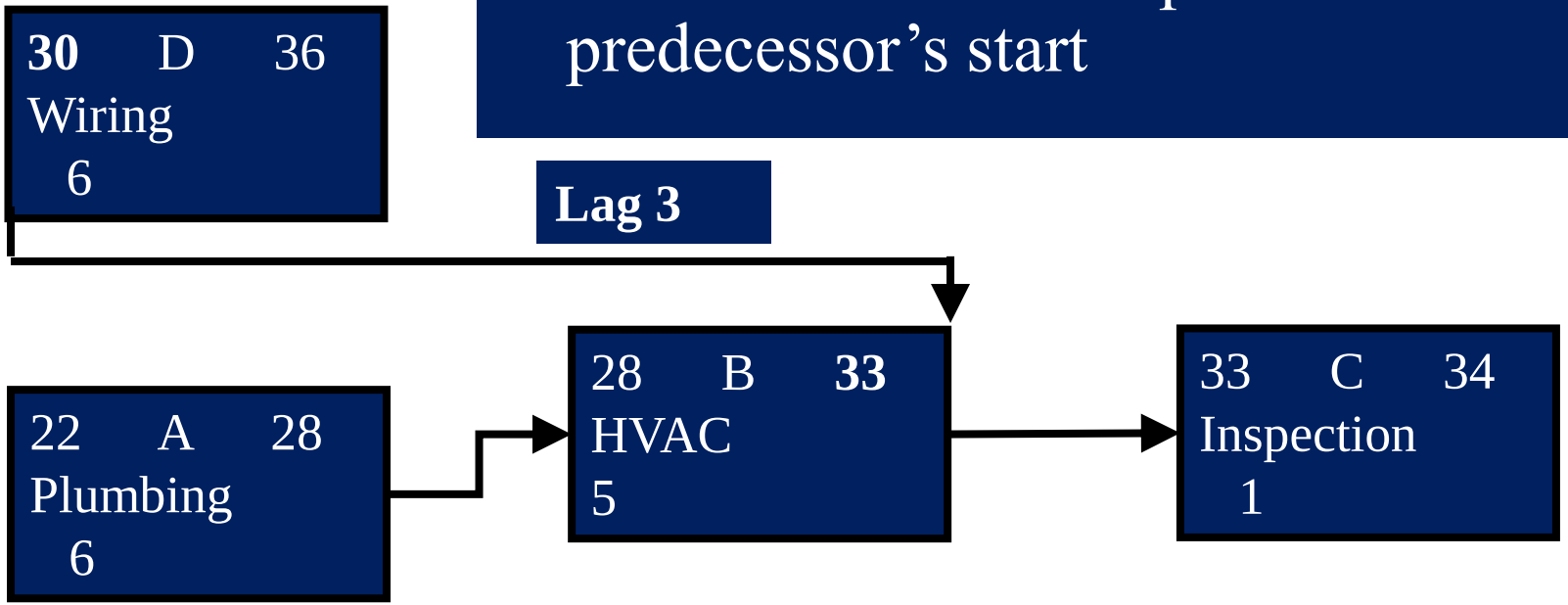


Start to Start Lag

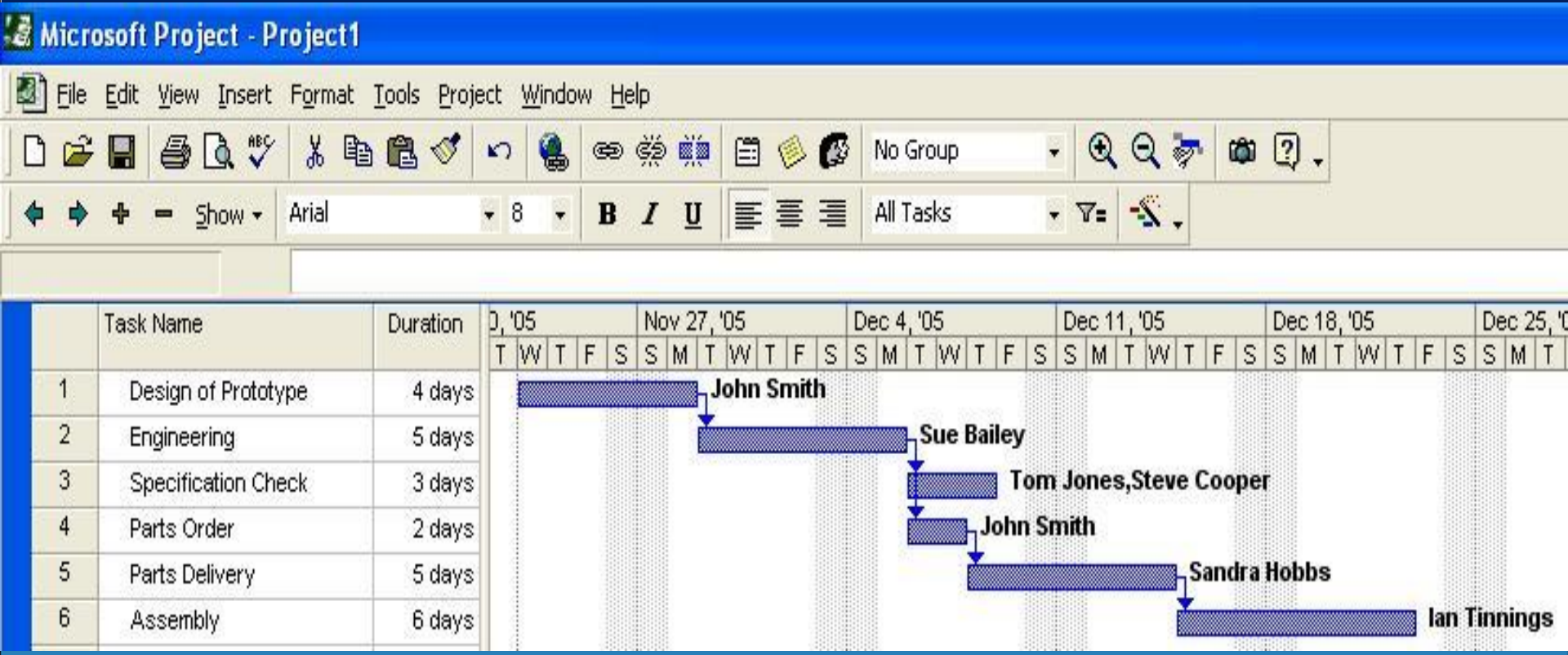


Start to Finish Lag

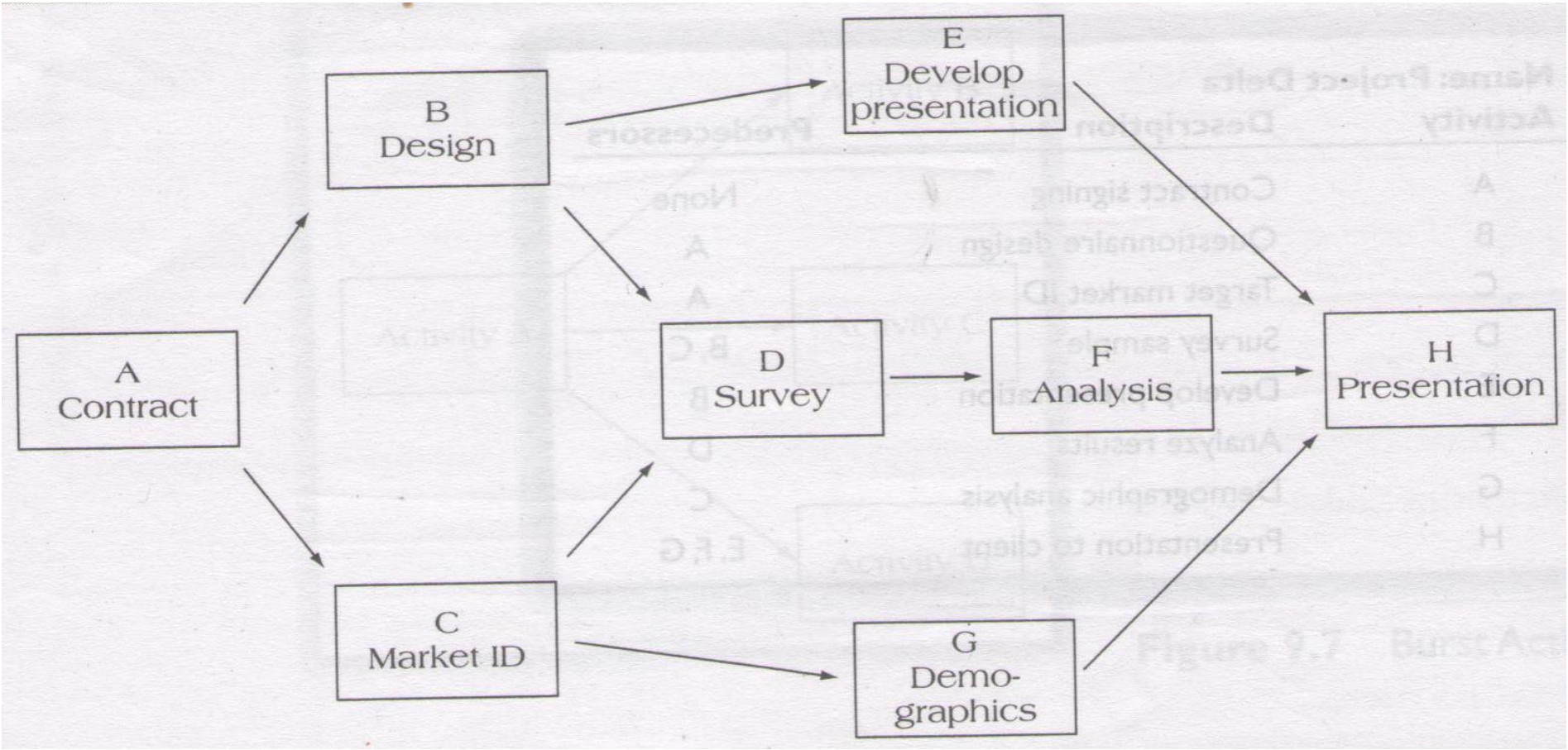
- Least common type of lag relationship
- Successor's finish dependent on predecessor's start

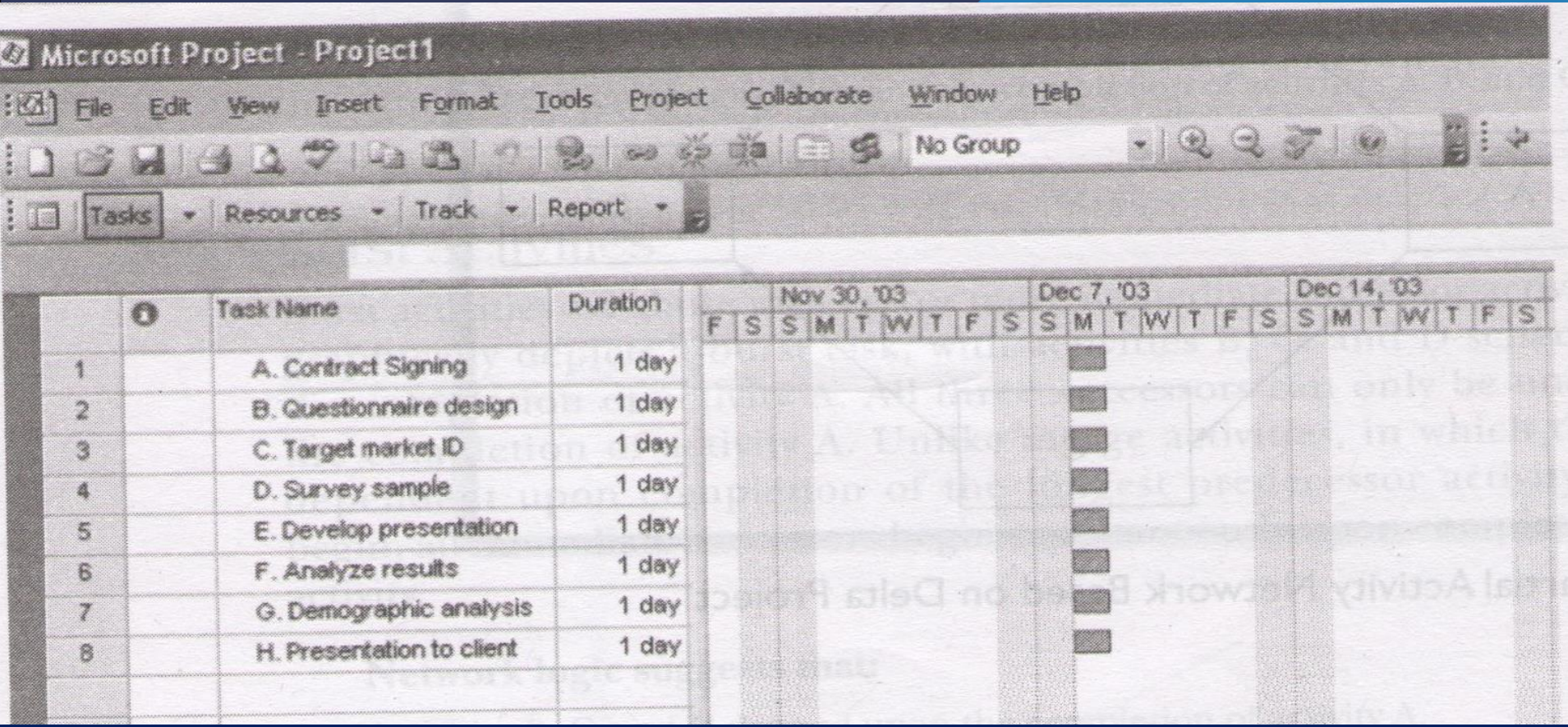


Gantt Chart With Resources in MS Project

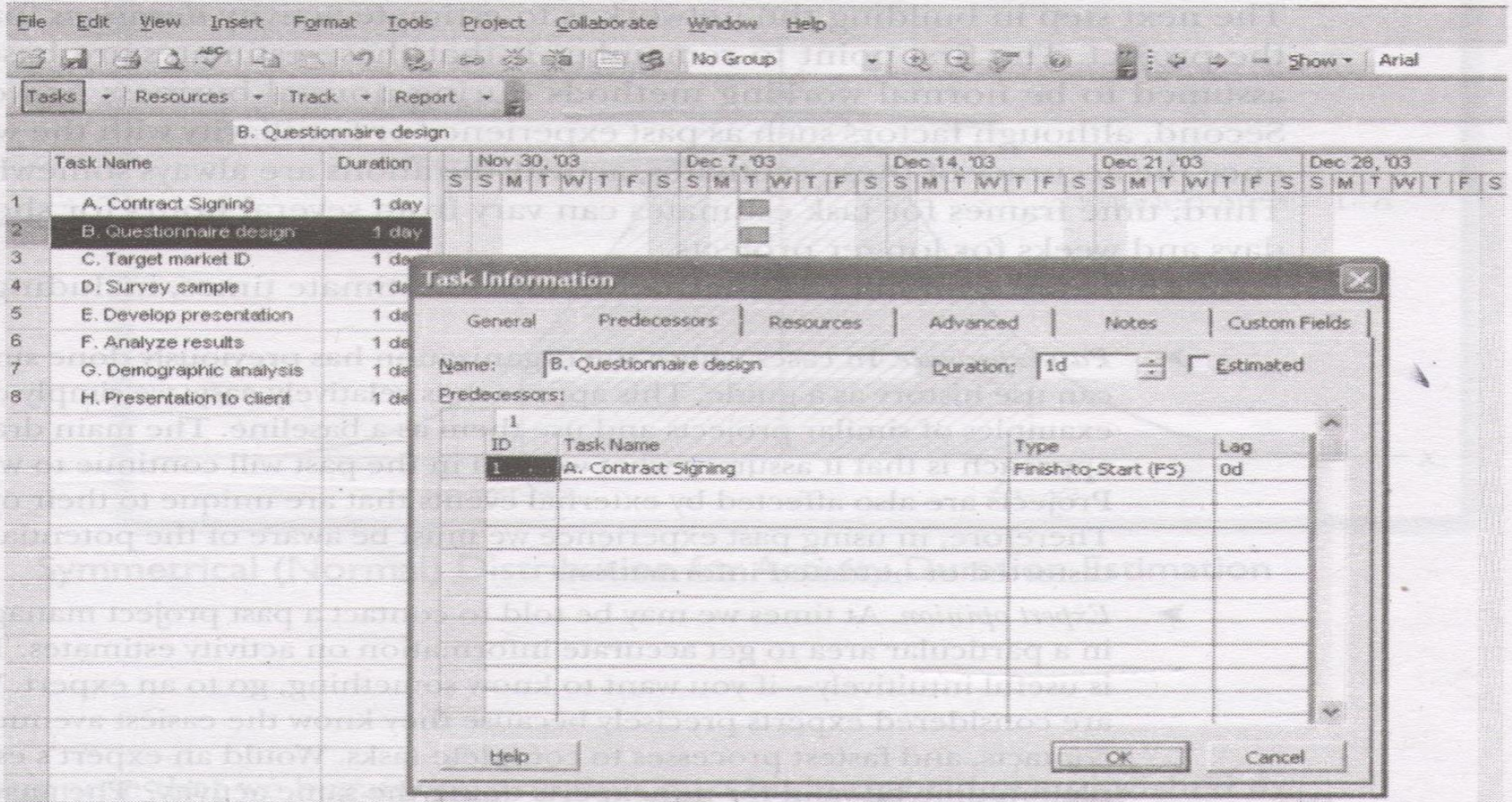


Activity	Description	Predecessors
A	Contract signing	None
B	Questionnaire design	A
C	Target market	A
D	Survey sample	B,C
E	Develop presentation	B
F	Analyze results	D
G	Demographic analysis	C
H	Presentation to client	E,F,G


A
Contract
B
Design
C
Market ID
D
Survey
E
Develop
presentation
F
Analysis
G
Demo-
graphics
H
Presentation



Duration is one day by default


File Edit View Insert Format Tools Project Collaborate Window Help
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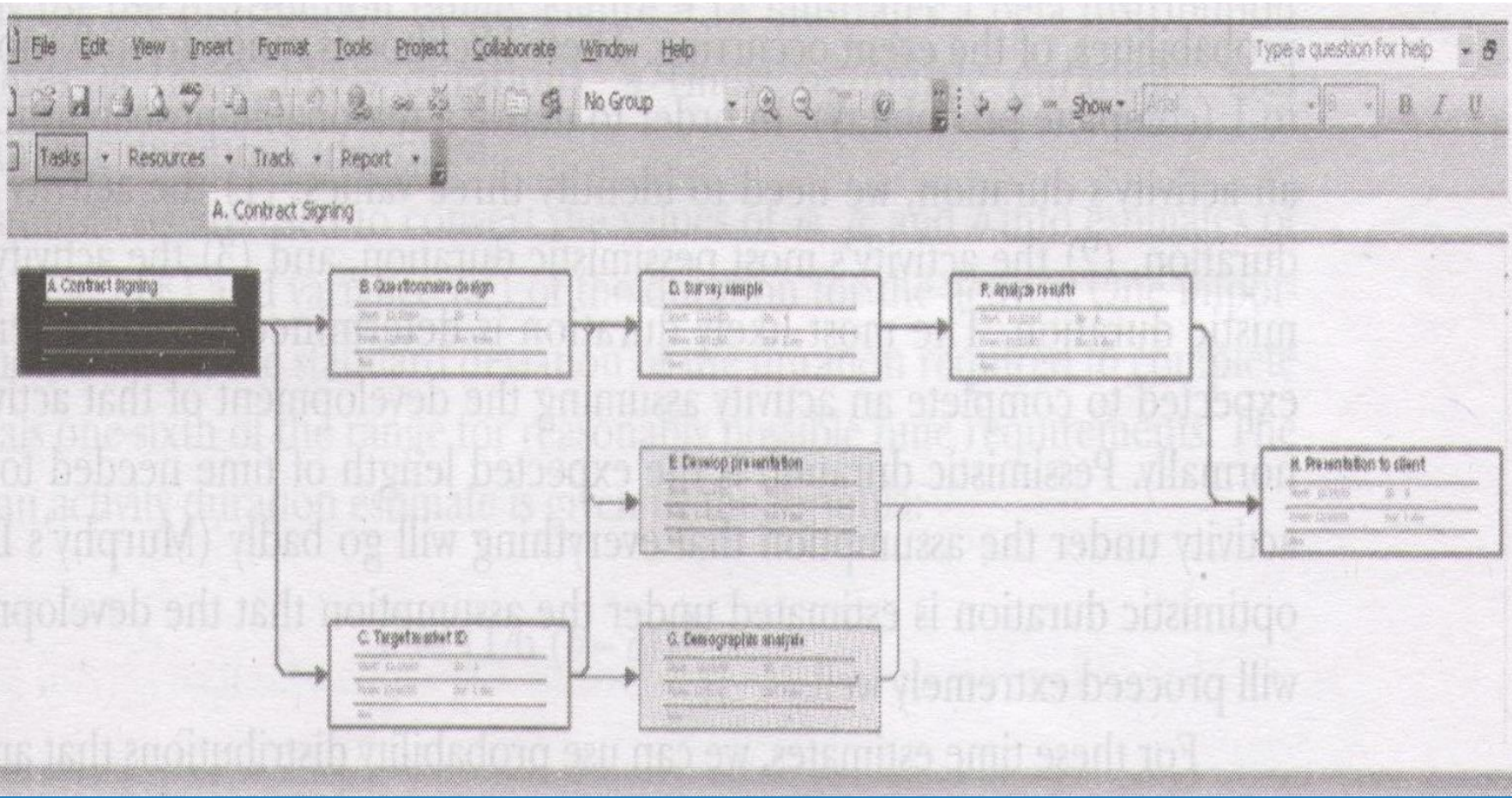
Show
Arial
Tasks
Resources
Track
Report
B. Questionnaire design
Task Name
Duration
1 A. Contract Signing 1 day
2 B. Questionnaire design 1 day
3 C. Target market ID
4 D. Survey sample
5 E. Develop presentation
6 F. Analyze results
7 G. Demographic analysis
8 H. Presentation to client
Nov 30, '03
Dec 7, '03
Dec 14, '03
Dec 21, '03
Dec 28, '03
Task Information
General
Predecessors
Resources
Advanced
Notes
Custom Fields
Name: B. Questionnaire design
Duration: 1d
Estimated
Predecessors:
ID
Task Name
Type
Lag
1 A. Contract Signing Finish-to-Start (FS) 0d
Help
OK
Cancel


File Edit View Insert Format Tools Project Collaborate Window Help
Type a question for help
No Group
Show
Tasks
Resources
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A. Contract Signing
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B. Questionnaire design
D. Survey sample
F. analyze results
E. Develop presentation
H. Presentation to client
C. Target market ID
G. Demographic analysis