IIT ROORKEE

NPTEL ONLINE CERTIFICATION COURSE

Project Management for Managers

Lec – 34

Project Time Management (Project Scheduling)

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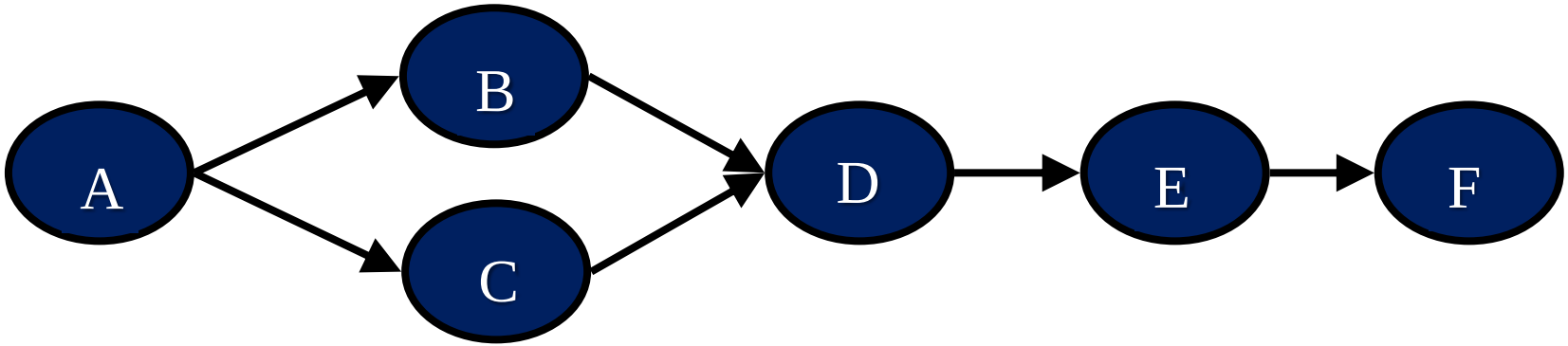
Project Scheduling Terms

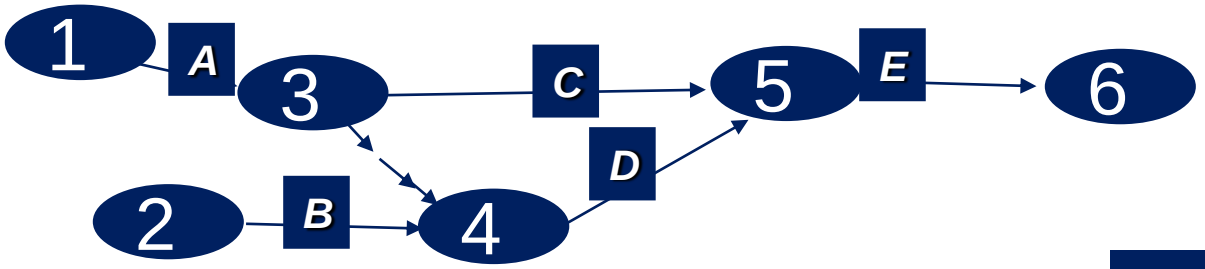
- Successors
- Predecessors
- Network diagram
- Serial activities
- Concurrent activities

- Merge activities
- Burst activities
- Node
- Path



Types of dummy activities

Job	Immediate predecessors
A	-
B	-
C	A
D	A,B
E	C,D

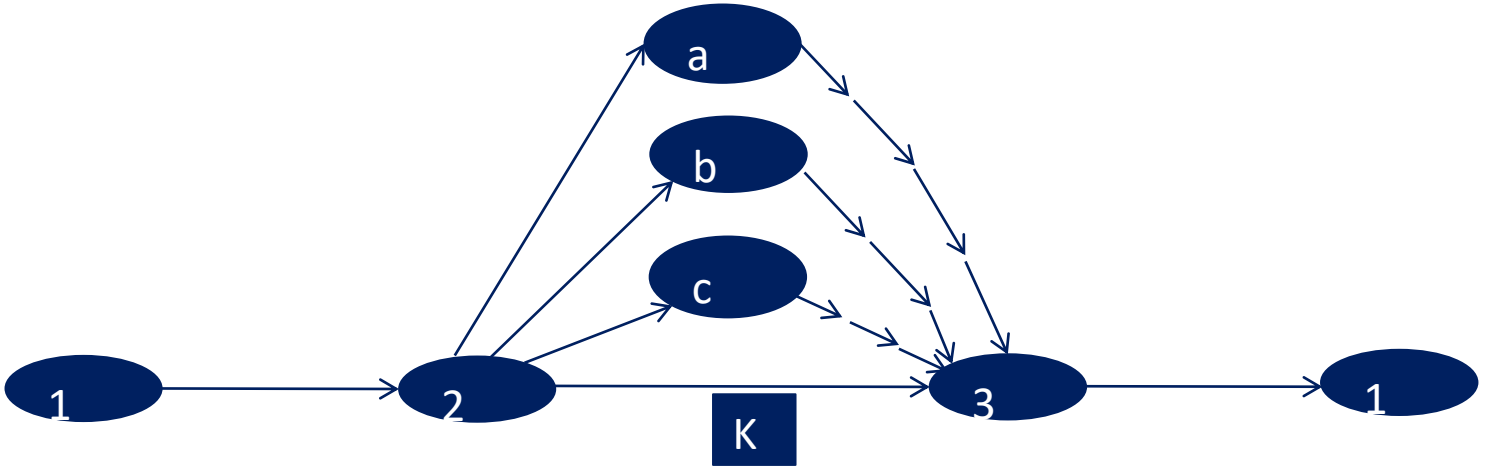


3-4 is a logical dummy activity

Apart from logical dummies one may be faced with situations where two or more activities have identical sets of predecessors and successors.

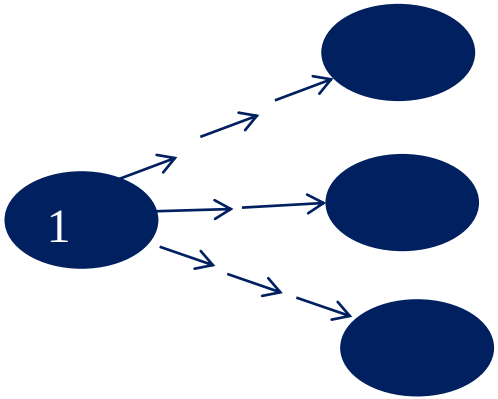
In this situation, the activities can be done in parallel or concurrently and their unique identification by referring to node numbers is *not* possible.

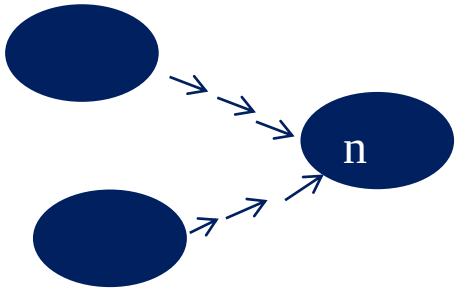
In such a situation , k parallel activities are modeled using k-1 dummies. The dummies so inserted are not logical dummies, but perform the function of dummies for unique representation



Dummies for unique representation of parallel activates

Another use of dummies is for creating a single source or single sink in a network which has multiple sources and/or sinks.



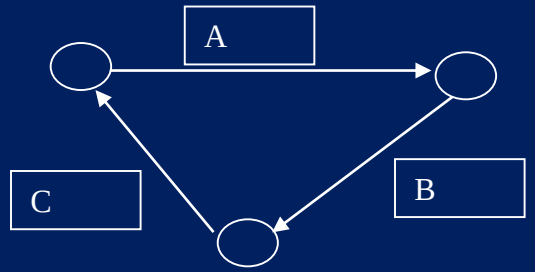


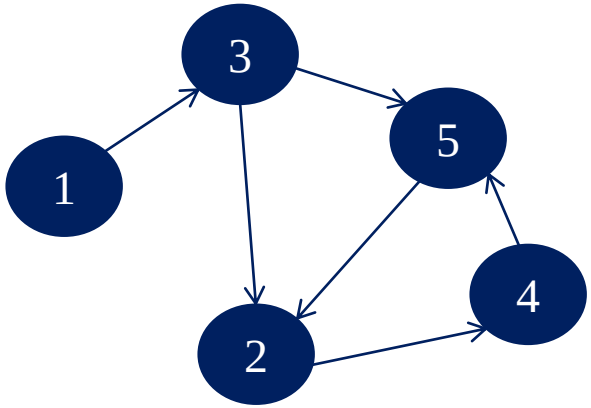
Dummies added for single source and sink

Types of network representation : A-O-N and A-O-A

It may be noted that if we use the A-O-N mode of representation where each activity is represented as a node, there is no need of adding any dummy activities to represent precedence or parallelism in activities since each activity would be well taken care of with suitable predecessors.

3. The arrow heads should not form a close loop/ consistency in project network





Adjacency matrix M

From node "i"to node "j"	1	2	3	4	5
1	0	0	1	0	0
2	0	0	0	1	0
3	0	1	0	0	1
4	0	0	0	0	1
5	0	1	0	0	0

M^2

From node "i"to node "j"	1	2	3	4	5
1	0	1	0	0	1
2	0	0	0	0	1
3	0	1	0	1	0
4	0	1	0	0	0
5	0	0	0	1	0

M^2 has all zeros on the diagonal, we compute M^3

From node "i"to node "j"	1	2	3	4	5
1	**0**	**1**	**0**	**1**	**0**
2	**0**	**1**	**0**	**0**	**0**
3	**0**	**0**	**0**	**1**	**1**
4	**0**	**0**	**0**	**1**	**0**
5	**0**	**0**	**0**	**0**	**1**

The appearance of 1^s to diagonal elements of nodes 2,4,5 indicates presence of loop and inconsistency . The loop is (2-4-5).

Hints for drawing networks:

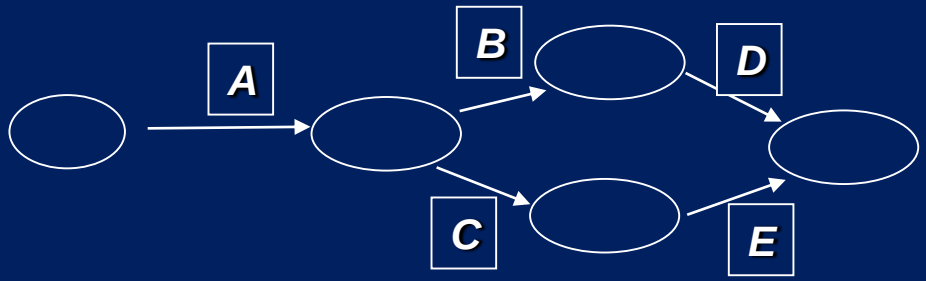
Example 1

-‘A’ precedes ‘B’ and ‘C’ or ‘B’ and ‘C’ follow ‘A’ or ‘B ‘and ‘C’ depend on ‘A’

- ‘D’ follows ‘B’

- E follows C

- D and E are terminal activities.



Hints for drawing networks:

Example 2

-‘A’ and ‘B’ start immediately

- ‘C’ follows both ‘A’ and ‘B’

- D follows A

- E follows D

- The project is complete when C and E are done

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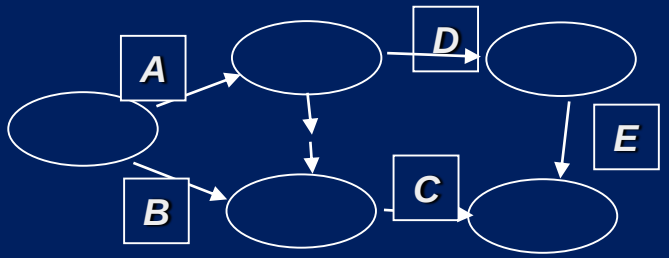

Hints for drawing networks:

Example 3

- 'A' starts immediately

- 'B', 'C' and 'D' follow 'A'

- E follows B, C, and D

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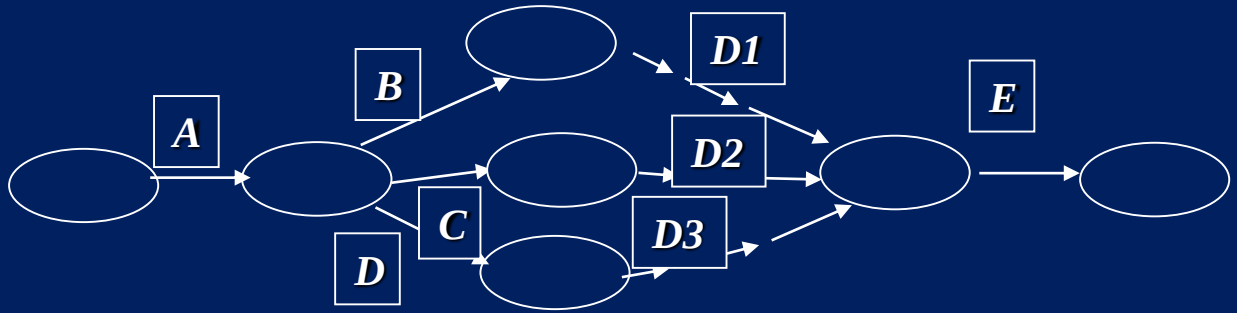


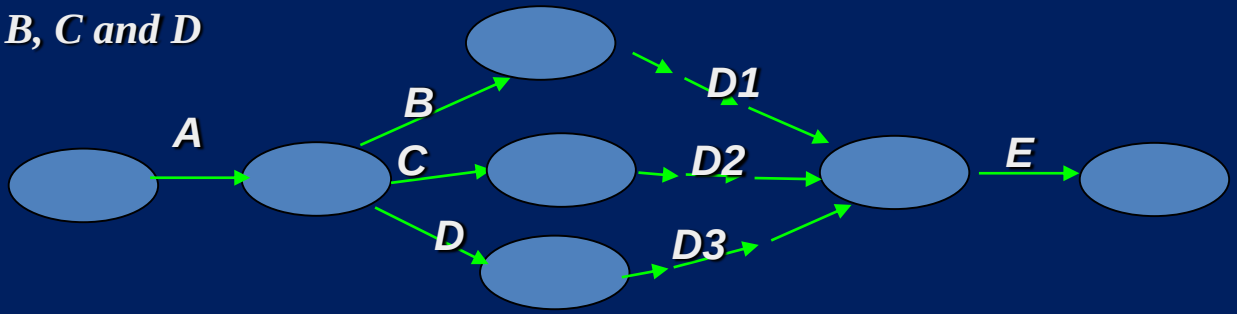
Hints for drawing networks:

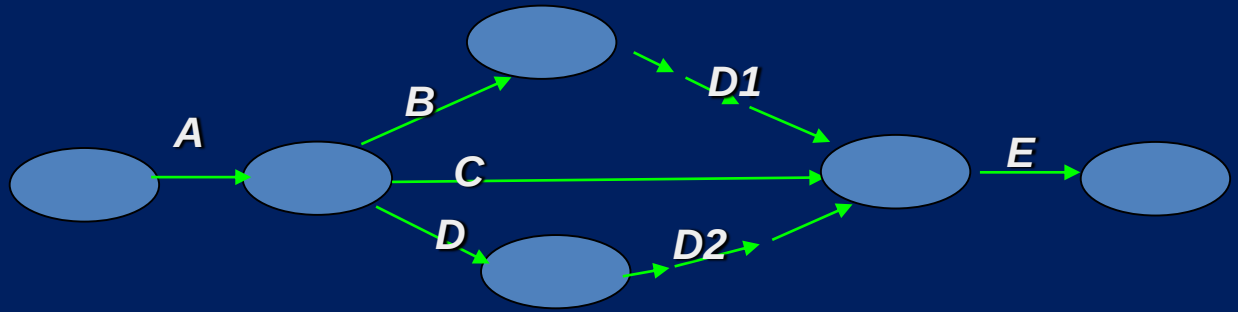
Example 3 Contd……

-'A' starts immediately

- 'B', 'C' and 'D' follow 'A'

- E follows B, C and D





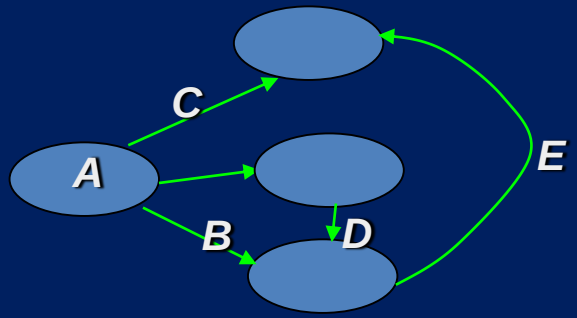
4. The arrows representing activities should be straight not curved.

- A,B and C start immediately

- D follows A

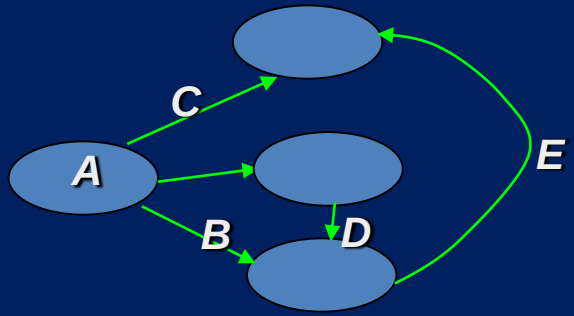
- E follows B and D

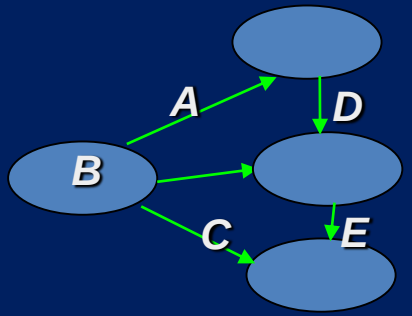
- C and E are terminal activities



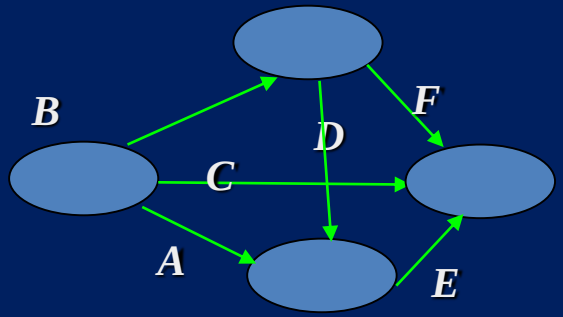
The arrows representing activities should be straight not curved.

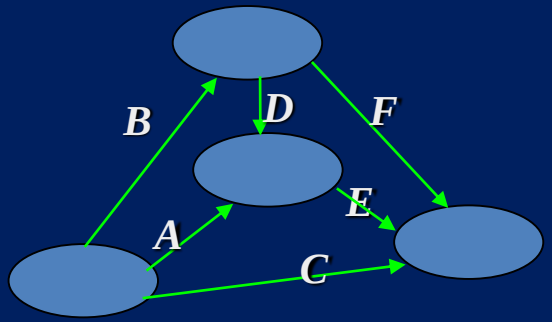
- *A, B and C start immediately*
- *D follows A*
- *E follows B and D*
- *C and E are terminal activities*





5. Avoid crossover of activities whenever possible.





Construct a network

- A and B are the first activities of the project start immediately,

- A precedes C and F,

- B precedes D and E ,

- F and D precede G and H,

- C and G precede I ,

- E , H and I are terminal activities.

Construct a network

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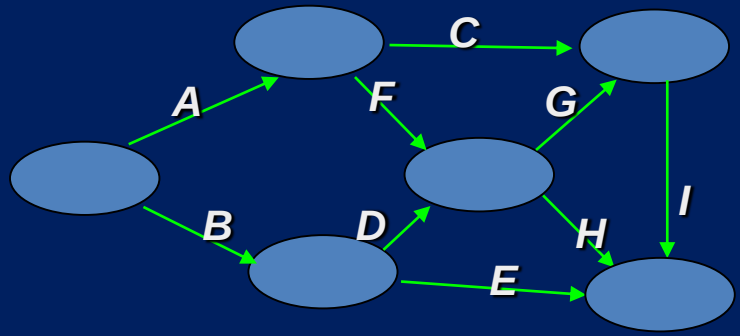
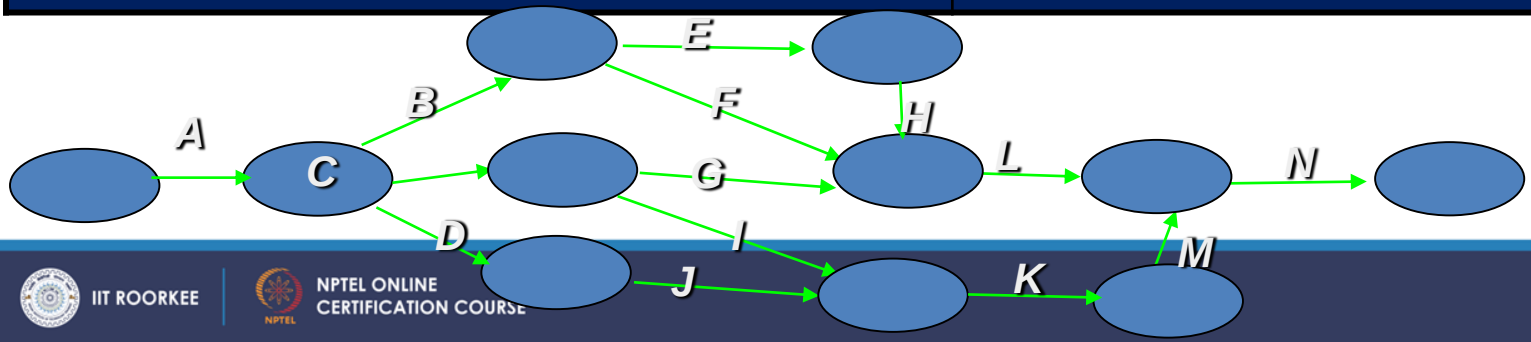


Construct a network

Activity	Depends on
A	None
B	A
C	A
D	A
E	B
F	B
H	E
G	C
I	C
J	D
K	I and J
L	F, G and H
M	K
N	L and M

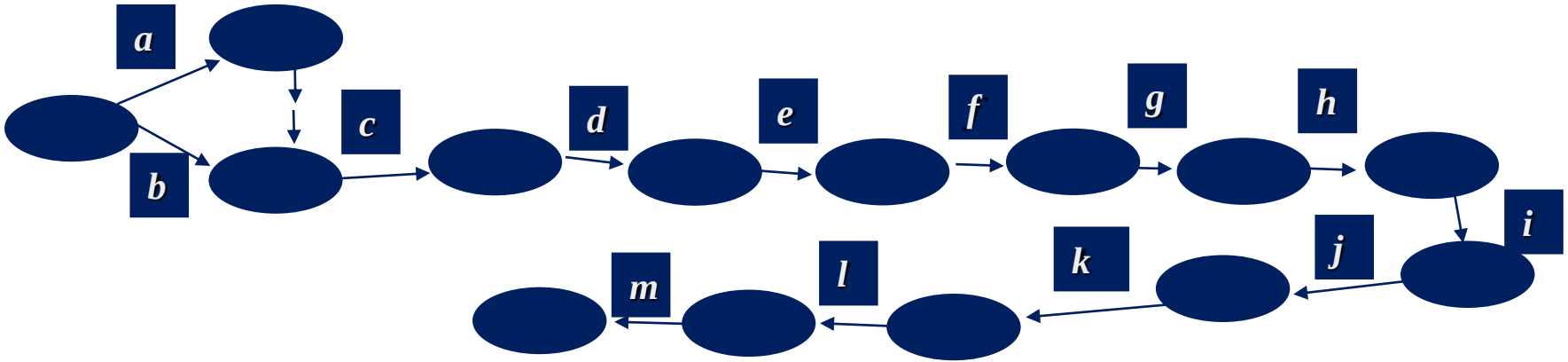
Activity	*Depends on*
A	*None*
B	*A*
C	*A*
D	*A*
E	*B*
F	*B*
H	*E*
G	*C*
I	*C*
J	*D*
K	*I and J*
L	*F, G and H*
M	*K*
N	*L and M*



a-review houses,
b-finalize requirements,
c-engage architect,
d-evaluate alternate designs,
e-finalize contractor,
f-foundations,

g-brickwork,
h-RCC,
i-plumbing,
j-wooden work,
k-organize party,
l-shift luggage,
m-settling in new house

Job	a	b	c	d	e	f	g	h	i	j	k	l	m
Predecessors	-	-	a,b	a,c	d	d,e	f	g	g,h	i	j	k	l



Activity on Arrow Network (A-O-A)

Activity on Node Network (A-O-N): Activities are represented on nodes and the arrows represent the precedence relation

a-review houses,
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Predecessors	-	-	a,b	a,c	d	d,e	f	g	g,h	i	j	k	l

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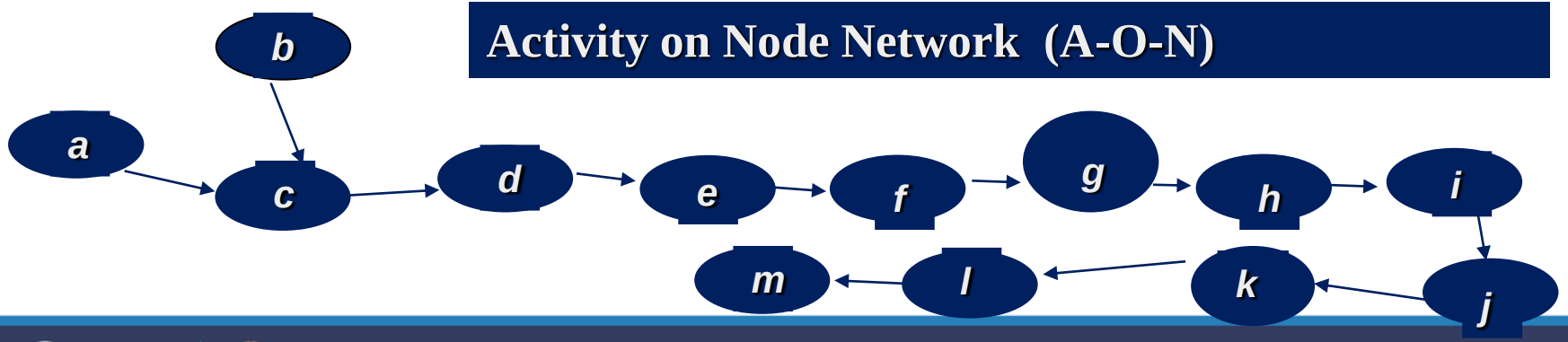
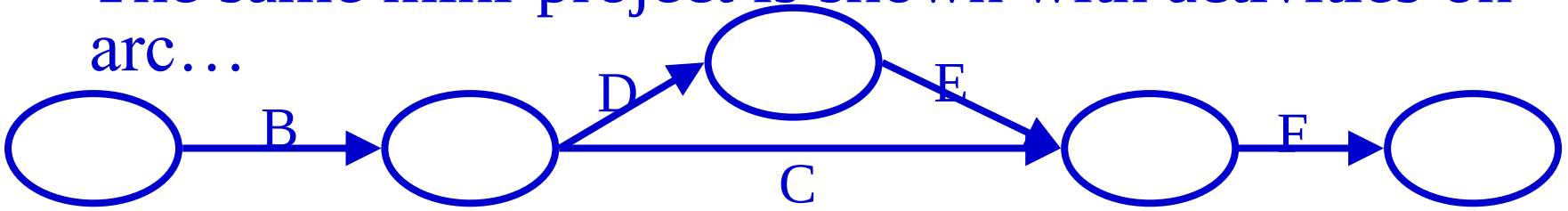
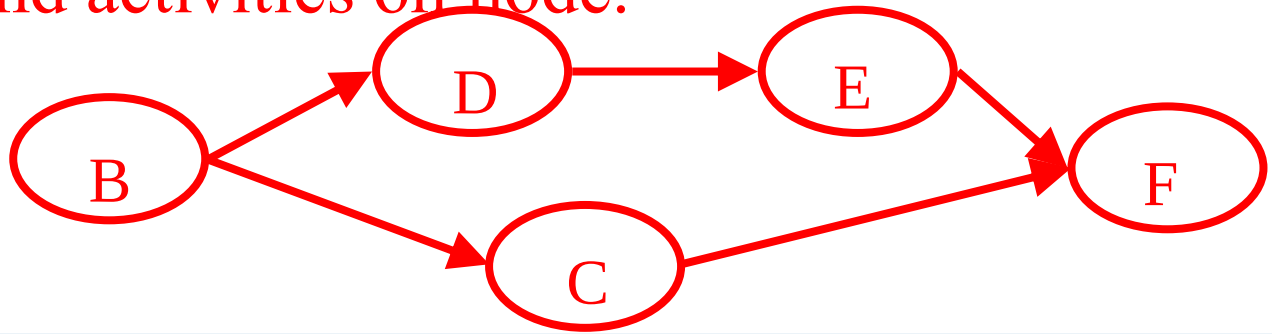
Activity on Node Network (A-O-N)



AOA Vs. AON

The same mini-project is shown with activities on arc…



…and activities on node.