

# Project Planning & Control

## *Lesson 6*

### *Review Network Analysis Concepts, Apply Network Analysis to Two-Span Bridge (Cont.,)*

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# Learning Objectives

1. Review Network Analysis Concepts
2. Apply Network Analysis to Two-Span Bridge
3. Discussion on results and alternatives

# Exercise – Network Analysis & Parameter Calculation

(From Lecture – 7)

Activity	Dur	Preced
A	11	S
B	3	S
C	9	S
D	7	B
E	9	A
F	5	A
G	5	C
H	19	A,C
I	5	F,G
J	17	E,D
K	3	H,I,K

Draw AON Network &  
Calculate

- ES, EF
- Project Duration
- LF, LS
- TF, FF,
- Critical activities
- INTF, INDF



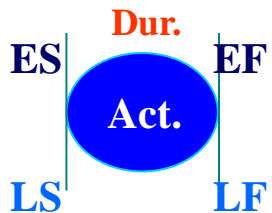
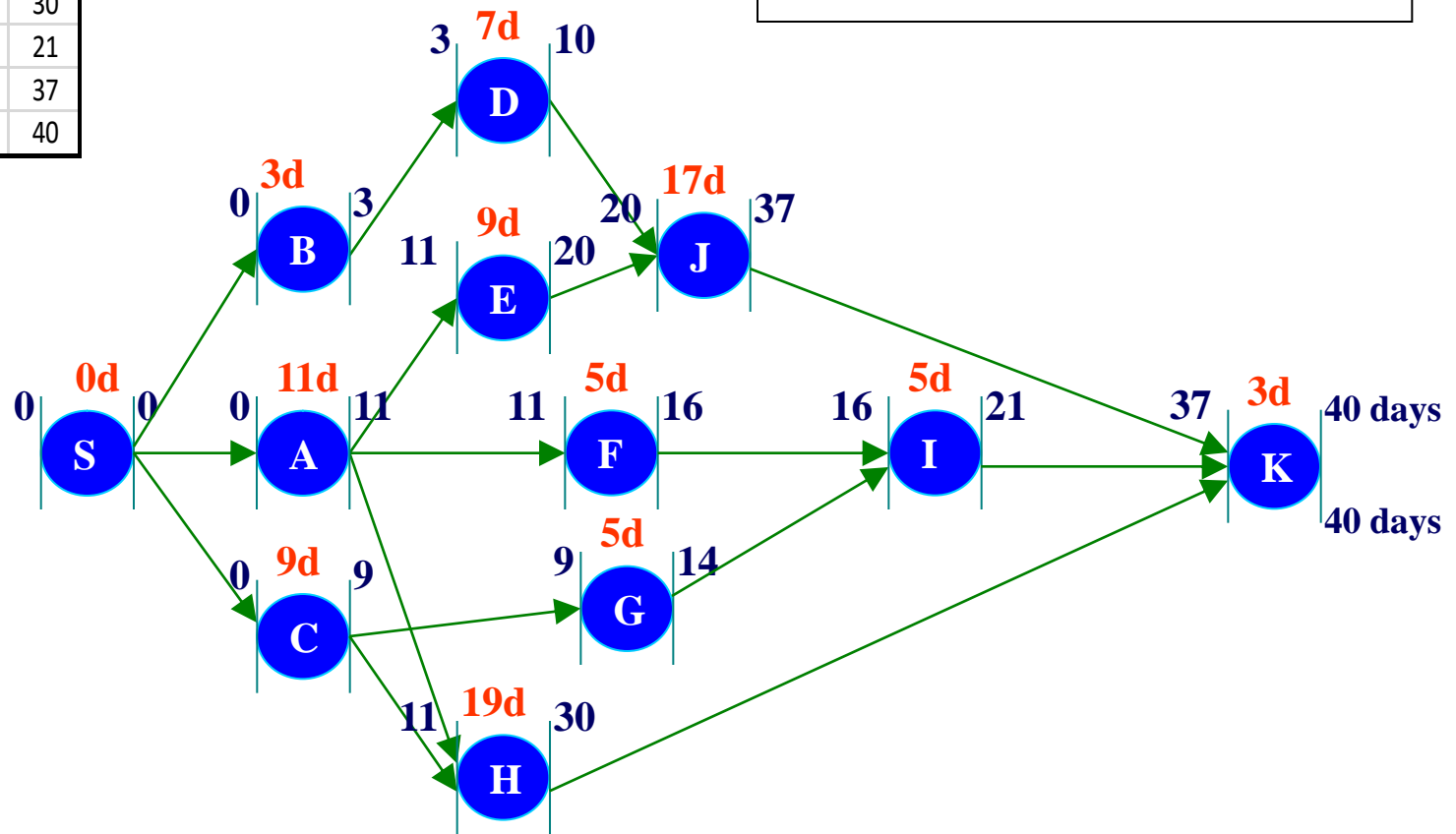
# Network Analysis

Activity	Dur	Preced	ES	EF
A	11	S	0	11
B	3	S	0	3
C	9	S	0	9
D	7	B	3	10
E	9	A	11	20
F	5	A	11	16
G	5	C	9	14
H	19	A,C	11	30
I	5	F,G	16	21
J	17	E,D	20	37
K	3	H,I,J	37	40

Forward Pass

ES = MAX (EF Preceding activities)

EF = ES + Duration

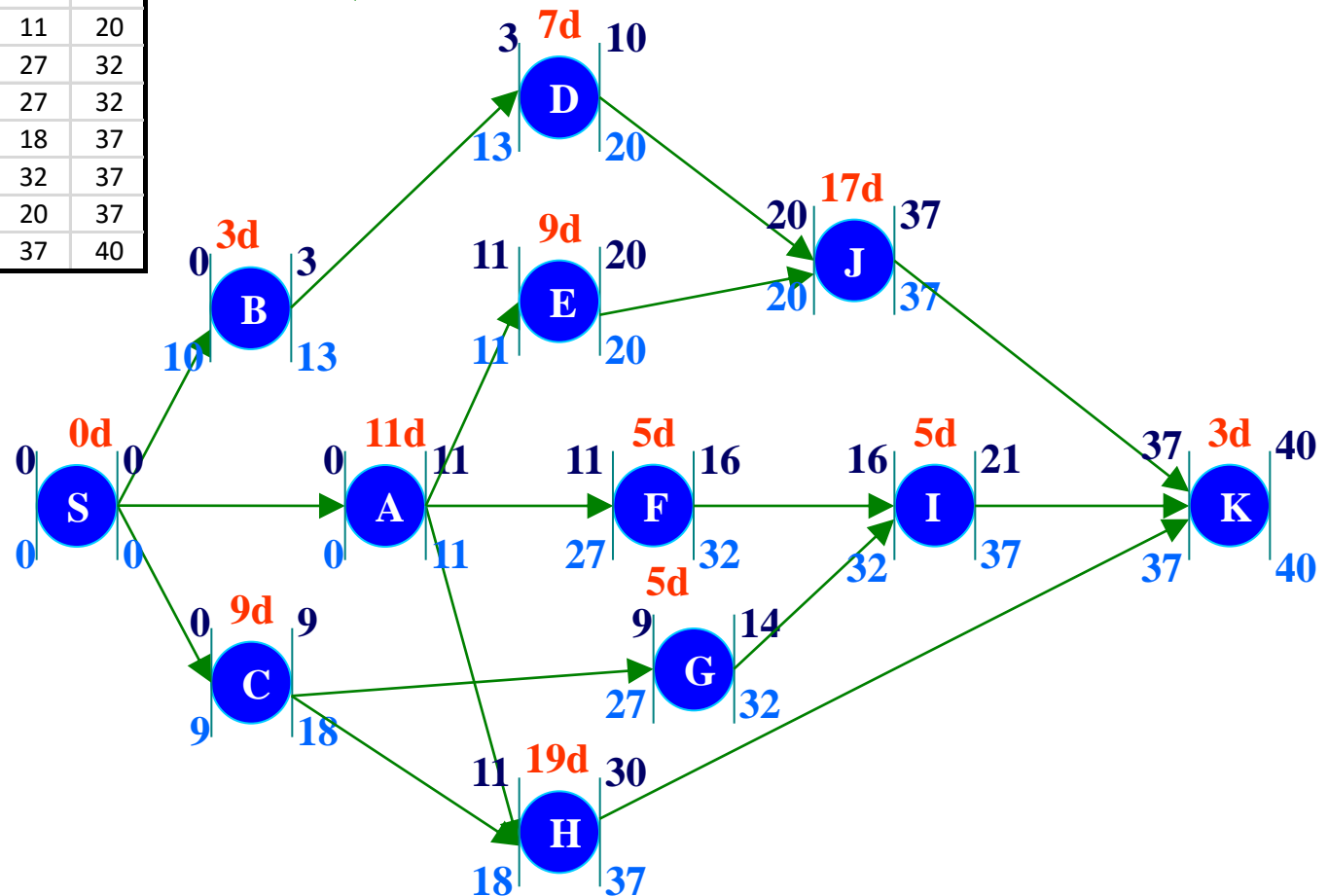
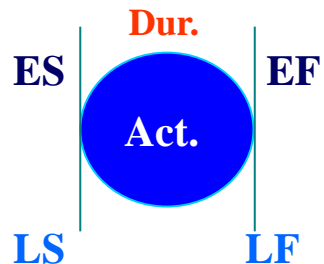


# Network Analysis

Activity	Dur	Preced	ES	EF	LS	LF
A	11	S	0	11	0	11
B	3	S	0	3	10	13
C	9	S	0	9	9	18
D	7	B	3	10	13	20
E	9	A	11	20	11	20
F	5	A	11	16	27	32
G	5	C	9	14	27	32
H	19	A,C	11	30	18	37
I	5	F,G	16	21	32	37
J	17	E,D	20	37	20	37
K	3	H,I,J	37	40	37	40

LF = MIN (LS Following activities)  
LS = LF - Duration

Backward Pass



# Network Analysis

Critical Path Identification → TF=0 for Critical Activities

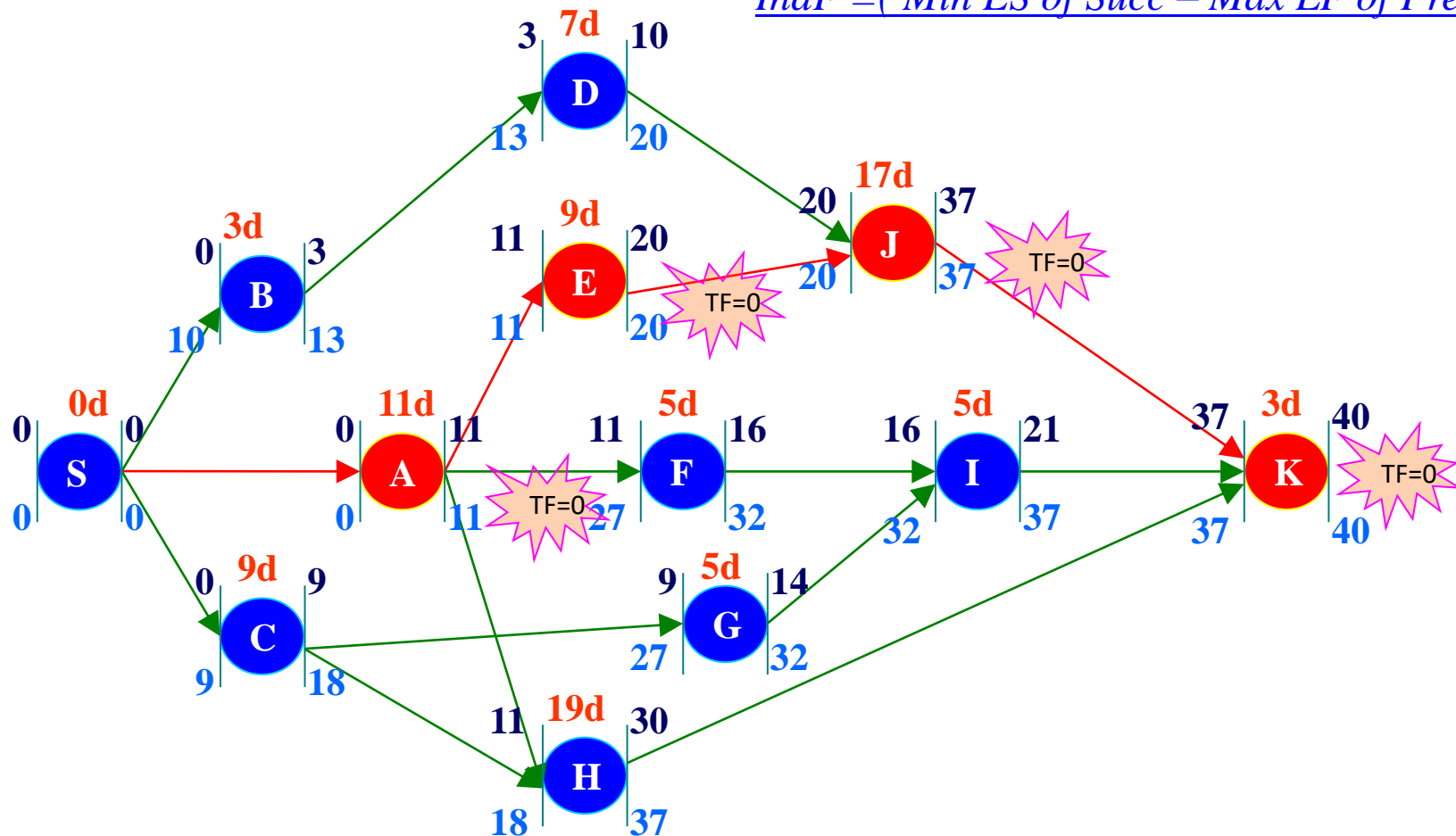
Float Calculation →

$$TF = (LS - ES) = (LF - EF)$$

$$FF = (\text{Min ES of Successor} - EF)$$

$$IntF = (TF - FF)$$

$$IndF = (\text{Min ES of Succ} - \text{Max LF of Pred} - \text{Dur})$$



Activi ty	Dura tion	Predec essor	Early Start	Early Finish	Late Start	Late Finish	TF	Critical	FF	INTF	INDF
A	11	Start	0	11	0	11	0	y	0	0	0
B	3	Start	0	3	10	13	10	n	0	10	0
C	9	Start	0	9	9	18	9	n	0	9	0
D	7	B	3	10	13	20	10	n	10	0	0
E	9	A	11	20	11	20	0	y	0	0	0
F	5	A	11	16	27	32	16	n	0	16	0
G	5	C	9	14	27	32	18	n	2	16	0
H	19	A,C	11	30	18	37	7	n	7	0	0
I	5	F,G	16	21	32	37	16	n	16	0	0
J	17	E,D	20	37	20	37	0	y	0	0	0
K	3	H,I,J	37	40	37	40	0	y	0	0	0



*Represent the activities on a bar-chart. Using the bar-chart explore the various floats.*