

Homework Planning and Scheduling

1. Keep a record of how you spend your time over the next week. Break it down by 30-minute intervals. What does this tell you about your time management skills?

Answer:

After breaking the week down into 30-minute intervals, I found that I could allocate my limited time more wisely. Work that used to take a lot of time to complete has been broken down to a significantly smaller amount of time, and I've been able to work more efficiently. Simultaneously, allocating my time well in advance allows me to reduce the amount of repetition in my work effectively. For example, before I had time to plan, I would only schedule my time through tasks. Just as before, I needed three days to complete the group project for my intelligent system. This time allocation resulted in a lack of clear goal orientation and interruptions such as a friend asking me to go to the gym or an unplanned recreational activity, which caused me to procrastinate and become easily distracted in the middle of a task. When I measure my tasks in 30-minute increments, I can focus better and have a clearer goal, leading to a significant improvement in my efficiency. As a result, I find that time segmentation provides me with a clear and organized work plan and effectively prevents us from wasting time with aimlessness or additional distractions.

2. Construct a Gantt chart for the project described by the following set of activities, and indicate the project completion time and the available slack for each activity:

Answer:

Activity	Time (Weeks)
1-2	3
1-3	7
2-4	2
3-4	5
3-5	6
4-6	1
5-6	4

Node	Activity	ES	OBS
1	A, B	0	ES = 0 for initial event
2	C	3	ES=0+3
3	D, E	7	ES=0+7
4	F	12	ES=7+5=12
5	G	13	ES=7+6=13
6		17	ES=7+6+4=17

Event &Activity Table

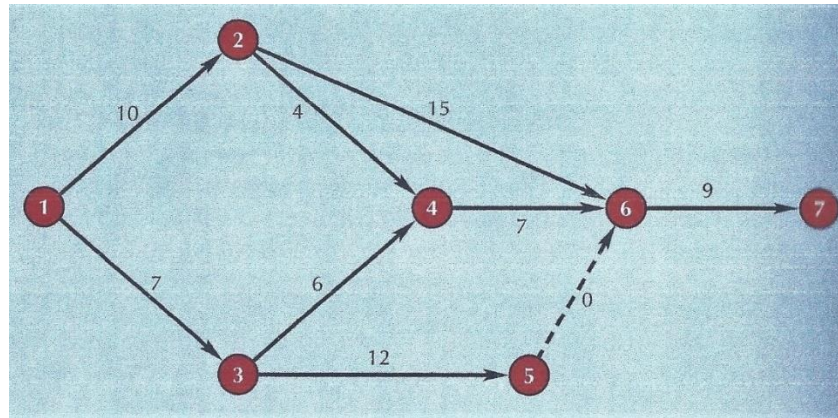
Activity	Node	Duration	ES	LS	Slack (Weeks)
A	1-2	3	0	11	11
B	1-3	7	0	0	0
C	2-4	2	3	14	11
D	3-4	5	7	11	4
E	3-5	6	7	7	0
F	4-6	1	12	16	4
G	5-6	4	13	13	0

Result Table

		Gantt Chart for the Project																			
Activity	Node	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17			
A	1-2																				
B	1-3																				
C	2-4																				
D	3-4																				
E	3-5																				
F	4-6																				
G	5-6																				

According to the plot, the finish time of the project is Week 17, the slack for 1-2 is 11 weeks, 1-3 is 0 weeks, 2-4 is 11 weeks, 3-4 is 4 weeks, 3-5 is 0 weeks, 4-6 is 4 weeks, 5-6 is 0 weeks.

3. Given the following network with activity times in weeks, determine the earliest start and finish times, latest start and finish times, and slack for each activity. Indicate the critical path and duration.



Answer:

Node	Activity	ES	OBS
1	A, B	0	ES = 0 for initial event
2	C, D	10	ES=0+10
3	E, F	7	ES=0+7
4	G	14	ES=10+4
5	H	19	ES=12+7
6	I	25	ES=10+5
7		34	ES=25+9

Event & Activity Table

Activity	Node	Duration	ES	EF	LS	LF	Slack (Weeks)
A	1-2	10	0	10	0	10	0
B	1-3	7	0	7	5	12	5
C	2-4	4	10	14	14	18	4
D	2-6	15	10	25	10	25	0
E	3-4	6	7	13	12	18	5
F	3-5	12	7	19	13	25	6
G	4-6	7	14	21	18	25	4
H	5-6	0	19	19	25	25	6
I	6-7	9	25	34	25	34	0

Result Table

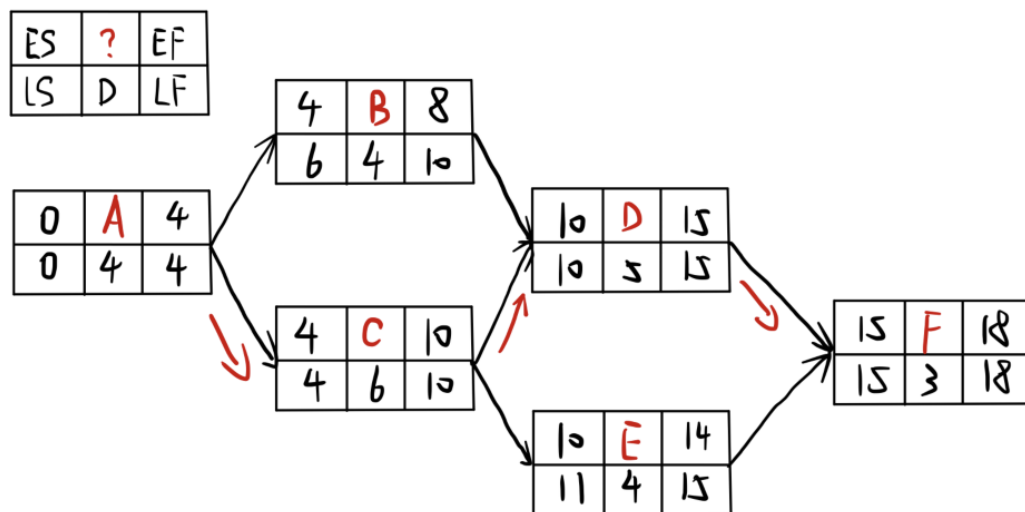
According to the Result Table we can know the earliest start and finish times, latest start and finish times, and slack for each activity. Also, we can find the critical path are 1-2, 2-6 and 6-7. The whole duration of this project is 34 weeks.

4. A marketing firm is planning to conduct a survey of a segment of the potential product audience for one of its customers. The planning process for preparing to conduct the survey consists of six activities with procedure relationships and activity time estimates as follows:

Activity	Description	Activity Predecessor	Time Estimates (Days)
A	Determine survey objectives	---	4
B	Select and hire personnel	A	4
C	Design questionnaire	A	6
D	Train personnel	B, C	5
E	Select target audience	C	4
F	Make personnel assignments	D, E	3

- a. Determine all paths through the network from activity A to activity F and the duration of each, and indicate the critical path.

Answer:



Critical path: A → C → D → F

- b. Determine the earliest and latest activity start and finish times.

Answer:

Activity	Duration	ES(Days)	EF(Days)	LS(Days)	LF(Days)
A	4	0	4	0	4
B	4	4	8	6	10
C	6	4	10	4	10
D	5	10	15	10	15
E	4	10	14	11	15
F	3	15	18	15	18

- c. Determine the slack for each activity.

Answer:

Activity	ES(Days)	LS(Days)	Slack
A	0	0	0
B	4	6	2
C	4	4	0
D	10	10	0
E	10	11	1
F	15	15	0

5. The Bank of Johnstown is planning to install a new accounts system. Bank management has determined the activities required to complete the project, the precedence relationships of the activities, and activity time estimates in the following table. Determine (a) the earliest and latest activity times, (b) the expected completion time and standard deviation, and (c) the probability the project will be completed in 40 weeks or less.

Activity	Description	Activity Predecessor	Optimistic Estimate (wks)	Most Likely Estimate (wks)	Pessimistic Estimate (wks)
A	Position recruiting	---	6	9	18
B	System development	---	4	13	16
C	System training	A	5	8	11
D	Equipment training	A	6	9	24
E	Manual system test	B, C	2	2	2
F	Preliminary system changeover	B, C	2	5	14
G	Computer-personnel interface	D, E	4	7	10
H	Equipment modification	D, E	2	3.5	8
I	Equipment testing	H	2	2	2
J	System debugging	F, G	3	3	3
K	Equipment changeover	G, I	6	9	12

a)

Answer:

Activity	Pre	O	M	P	T _E	sigma	ES	EF	LS	LF
A	-	6	9	18	10	2	0	10	0	10
B	-	4	13	16	12	2	0	12	7	19
C	A	5	8	11	8	1	10	18	11	19
D	A	6	9	24	11	3	10	21	10	21
E	B, C	2	2	2	2	0	18	20	19	21
F	B, C	2	5	14	6	2	18	24	28	34
G	D, E	4	7	10	7	1	21	28	21	28
H	D, E	2	3.5	8	4	1	21	25	22	26
I	H	2	2	2	2	0	25	27	26	28
J	F, G	3	3	3	3	0	28	31	34	37
K	G, I	6	9	12	9	1	28	37	28	37

The earliest and latest activity times are shown above.

b)

Answer:

The expected completion time is 10+11+7+9=37 weeks.

The standard deviation is shown above.

c)

A-D-G-K:

$$\begin{aligned}
 T_{CP} &= 10 + 11 + 7 + 9 = 37 \\
 \sigma_{CP}^2 &= 4 + 9 + 1 + 1 = 15 \\
 z &= \frac{FT - T_{CP}}{\sigma_{CP}} = \frac{40 - 37}{\sqrt{15}} = 0.77 \\
 \Phi(z = 0.77) &= 77.94\%
 \end{aligned}$$