

Assignment (3)

Crashing and Resource Allocation

1. The following data were obtained from a study of the times required to overhaul a chemical plant:

Activity	Crash Schedule		Normal Schedule	
	Time	Total Activity Cost	Time	Total Activity Cost
1-2	3	6	5	4
1-3	1	5	5	3
2-4	5	7	10	4
3-4	2	6	7	4
2-6	2	5	6	3
4-6	5	9	11	6
4-5	4	6	6	3
6-7	1	4	5	2
5-7	1	5	4	2

If the cost is given in thousands of pounds then find the following:

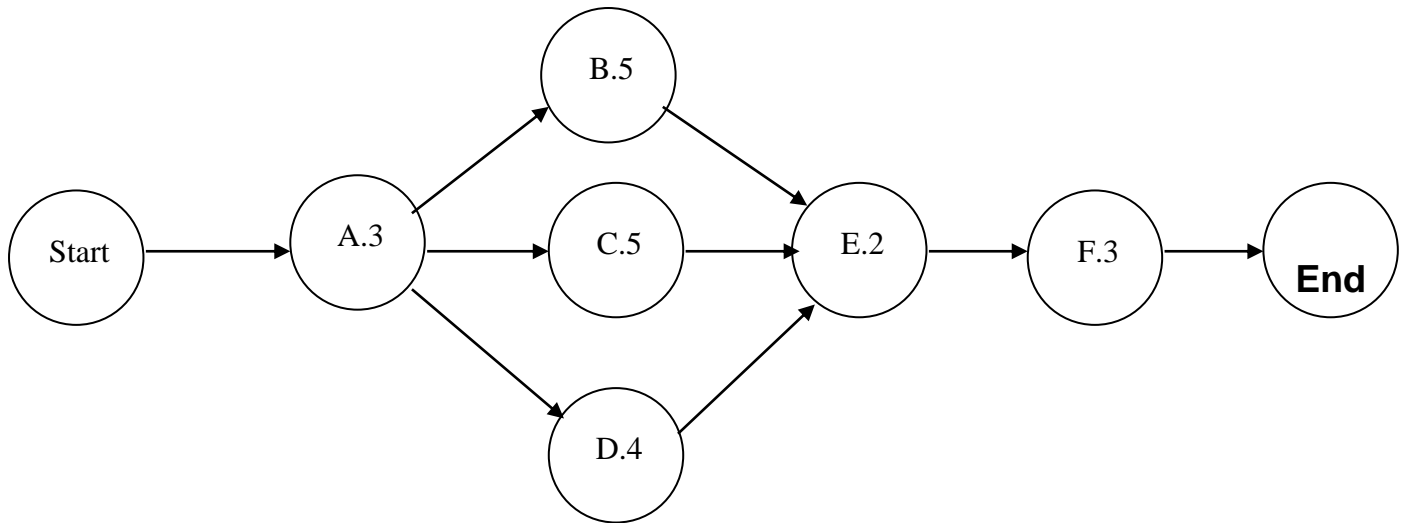
- The project completion time (use AON).
- Find the minimum completion time with the minimum possible cost.
- The difference in project cost when finished in the normal time and that in the crash time.

2. For the next project find the completion time and the critical path, and then find the least possible time in order to complete the project with the least additional cost. Find the project total cost in the later case.

Activity	Predecessor	Time (days)		Cost (L.E.)	
		Normal Time	Crash Time	Normal Cost	Crash Cost
A	---	2	2	100	100
B	---	4	3	400	500
C	A	3	1	1000	1500
D	B	1	1	500	500
E	C	6	5	300	500
F	B	9	7	1500	1900
G	F	7	6	400	700
H	E, D	3	3	50	50
I	G	2	2	150	150
J	H, I	9	6	400	850
K	B	2	2	600	600
L	K	5	5	200	200
M	L	6	6	100	100

Then find the optimal project total cost if it is desired to be ended in 28 days.

3. Before the start of the project, a project planner sent a memo to his boss, the director project management, stating that the MX project would require thirteen weeks for completion according to the figure shown below:



The project planner realized that the customer wanted the job completed in less time. After discussion with the functional managers, he/she developed the table shown below:

Task	Normal		Crash		Worker needed
	Time	Cost	Time	Cost	
A	3	6,000	2	8,000	5
B	5	12,000	4	13,500	7
C	5	16,000	3	22,000	3
D	4	8,000	2	10,000	2
E	2	6,000	1	7,500	8
F	3	14,000	1	20,000	4

If the cost is given in thousands of pounds then find the following:

- The project completion time.
- Draw the resource loading chart.
- Find the minimum completion time with the minimum possible cost.
- The difference in project cost when finished in the normal time and that in the crash time.
- The cost of finishing the cost in nine days.

4. Given the following network and the required number of workers for each activity:

Activity	Time (Days)	No. of Workers
1-2	10	6
1-3	10	4
1-4	5	4
2-6	10	2
3-6	5	10
3-7	15	8
4-5	10	6
5-7	5	2
6-7	5	2

- What is the completion time of the project?
- Draw a TSTETIL chart.
- Draw the resource loading graph.
- Try to level the resource loading as possible.