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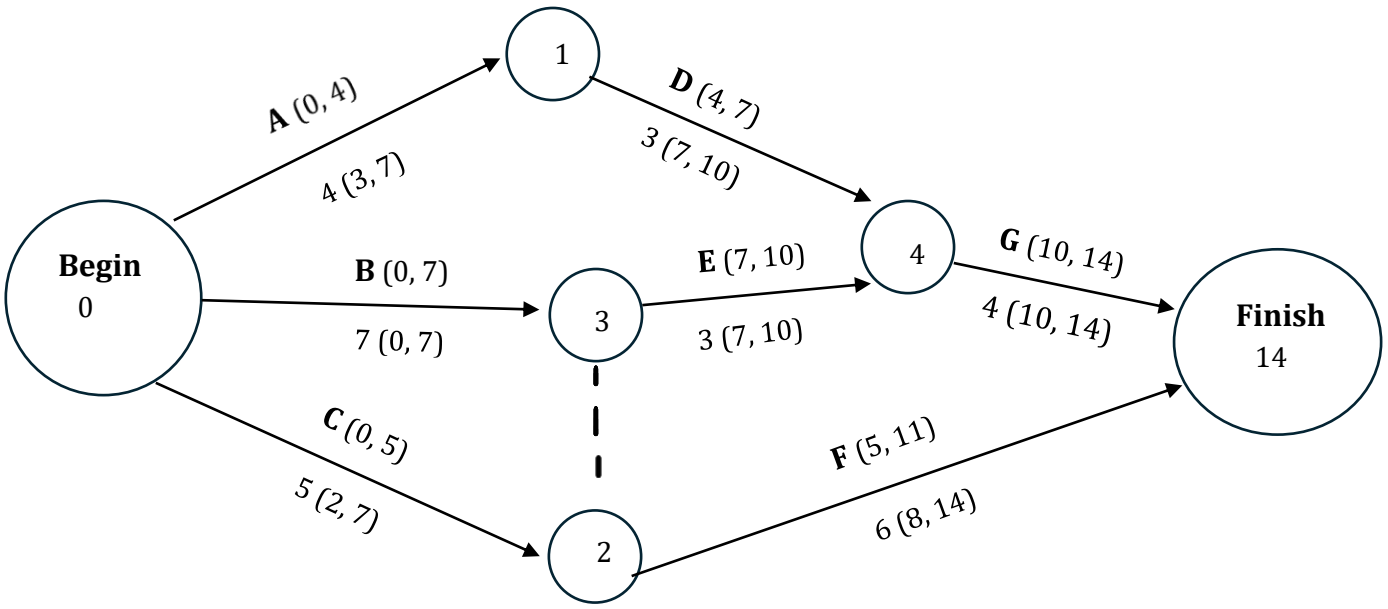
PROJECT MANAGEMENT: ACTIVITY SEQUENCING AND RESOURCE REQUIREMENTS PLANNING

Contents

1. Project table/Elements

Activity	Duration (days)	Immediate Predecessor	Workers
A	4	_	2
B	7	_	3
C	5	_	2
D	3	A	2
E	3	B,C	2
F	6	C	3
G	4	D,E	2

2. Network Diagram



A Network diagram for the projects implemented using activity-on-arrow format, activities of the letters A to G. The activities shows that A must be completed before D, D before G, C before F, B before E etc. The activities have start and end nodes represented by circles. All the paths must take us to the finish node.

3. Critical Path Method (CPM)

Activity	Earliest Finish (EF)	Latest Finish (LF)	Slack (LF-EF)
A	4	7	3
B	7	7	0
C	5	7	2
D	7	10	3
E	10	10	0
F	11	14	3
G	14	14	0

Path 1: A+D+G = 11
Path 2: B+E+G = 14
Path 3: C+E+G = 12
Path 3: C+F = 11
Critical Path ==> B, E and G

Critical path activities B, E and G determines the earliest time by which the project can be completed they are the longest path and have least amount of slack. Slack which is an amount of time a project can be delayed without delaying the project finish day.

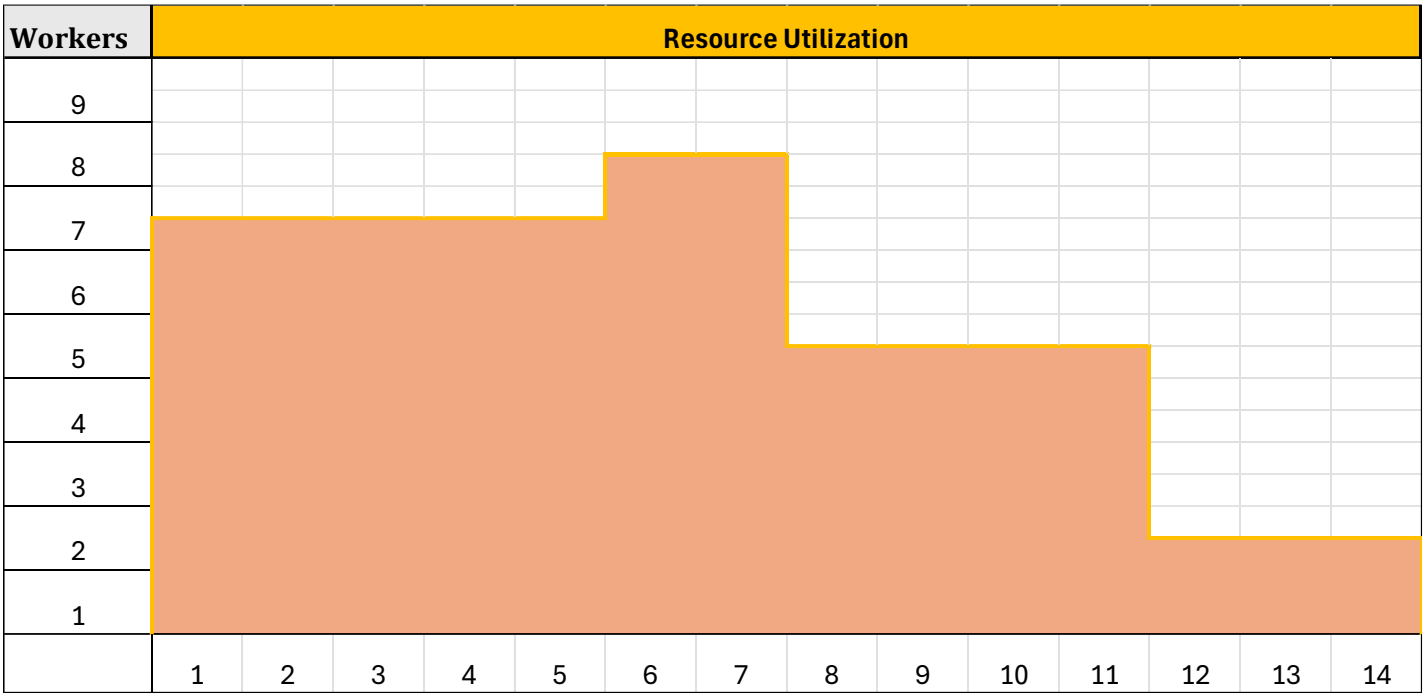
4. Determining Worker days for the Project

Activity	**Resource Requirements Plan**														WorkerDays
A	2 Workers														8
B	3 Workers														21
C	2 Workers														10
D					2 Workers										6
E								2 Workers							6
F								3 Workers							18
G											2 Workers				8
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Workers	7	7	7	7	7	8	8	5	5	5	5	2	2	2	77

Worker days = 77 where a minimum of 2 workers will be working towards the end of the project and maximum of 8 workers will be needed when project is in its halfway.

A s the project progresses the resources are utilized, and utilization shows the high fluctuation rate among the resources which might be resolved by resource levelling.

5. Resource Utilization



6. Resource Levelling/ Smoothing

Using resource limited scheduling it is the best method that develops the shortest schedule when the number of or amount of available resources is fixed and cannot be increased

This method extends the project completion time and does not exceed the fixed available resources.

Several activities need the same limited resource at the same time, the activities with least slack have highest priority.

The lower priority activities get delayed, but the delaying of activities may delay the project.

Activity	Resource Requirements Plan																		WorkerDays
A						2 Workers													8
B			3 Workers																21
C		2 Workers																	10
D										2 Workers									6
E								2 Workers											6
F															3 Workers				18
G											2 Workers								8
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Workers	5	5	5	5	5	5	5	4	4	4	4	4	5	5	3	3	3	3	77

7. Resource Utilization after Resource levelling