

Exercise on Critical Path Method :

A property developer wishes to renovate a house. To keep his costs to a minimum he likes to have only one worker working on each activity. The property renovation involves various tasks which he estimates will take one worker the times shown in the table below:

Activity	Time needed to complete
Substantial repairs to the roof	8 days
Internal structural work	4 days
Electrical work	7 days
Plumbing	6 days
Installing a new kitchen	3 days
Installing a new bathroom	4 days
Garden	5 days
Plastering	4 days
Internal decoration	5 days
Fitting carpets	1 day
Outside paintwork	5 days

The roof and structural work must be completed before any other activities (inside or outside) can commence. Once these are done, the external jobs can happen at any stage. However, inside the house, the plumbing and electrics must be completed before the plastering can be done. The plastering must be complete before the new kitchen and bathroom can be installed. Decoration can only happen once the kitchen and bathroom are in place, and carpets can only be fitted after decorating.

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Questions :

- **Can it be done?**
- **Which activities is it most important for the property developer to keep on track?**

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For simplicity let us assign letters to our activities:

- A – Roof

B – Structural work

C – Electrics

D – Plumbing

E – Kitchen

F – Bathroom
- G – Garden

H – Plastering

I – Decoration

J – Carpets

K – External paintwork

Comment : Compared to the course, it corresponds to the stage : Identify the activity

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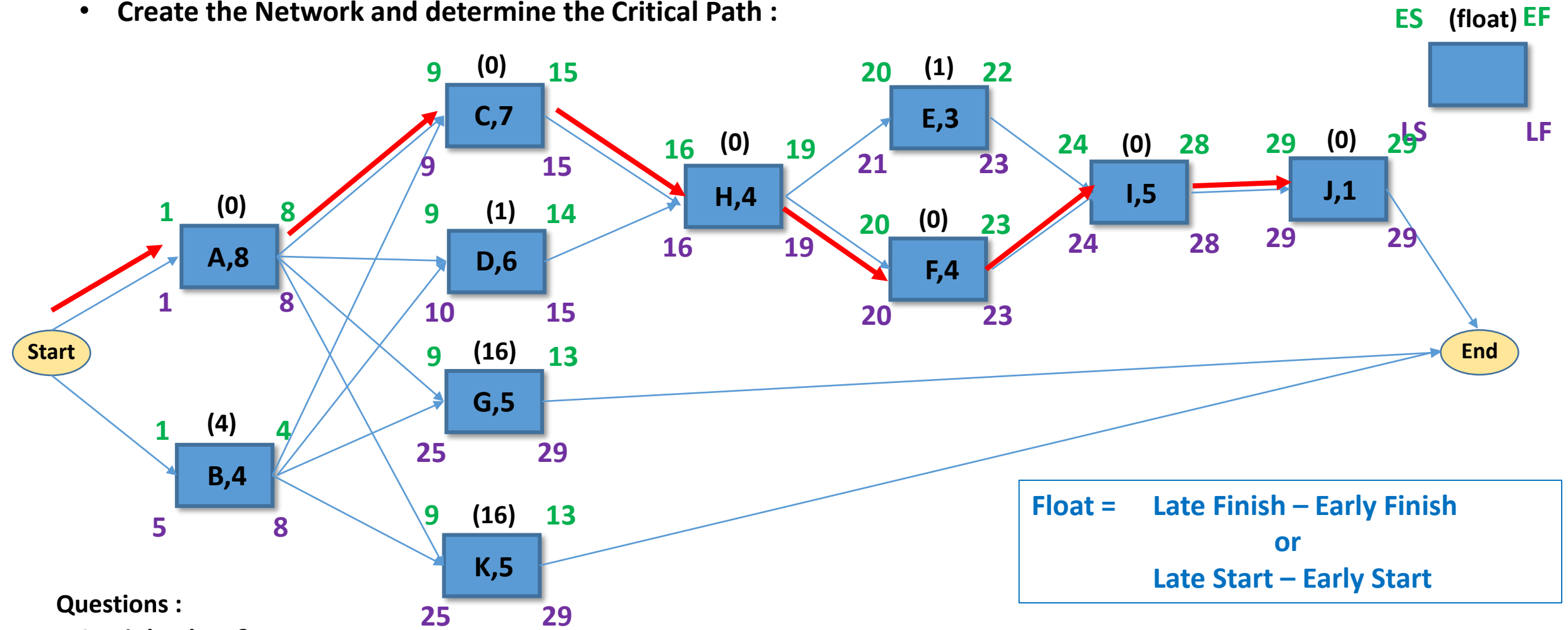
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[illegible]

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Activity	A	B	C	D	E	F	G	H	I	J	K
Dependency	-	-	A,B	A,B	H	H	A,B	C,D	E,F	I	A,B
days	8	4	7	6	3	4	5	4	5	1	5

- Create the Network and determine the Critical Path :



Questions :

- Can it be done?

➔ The minimum length of time in which the project can be completed is **29 days**. This is less than 6 weeks, so the property developer can achieve his goal.

- Which activities is it most important for the property developer to keep on track?

➔ The **critical activities** are A, C, H, F, I and J, and it is these that the property developer must keep on track

• **Assignment of resources :**

→ Assumption : 2 workers

(days)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Worker# 1	Roof (8d)								Electrics (7d)							Plastering (4d)				Bathroom (4d)				Decoration (5d)					Carpet (1d)	
Worker# 2	Structural (4d)								Plumbing (6d)						Garden (5d)					Kitchen (3d)			Outside paintwork (5d)							

Conclusion

Questions :

- What are the advantages to the property developer in using critical path analysis to plan this project?**
- How realistic is the idea of using only two workers to complete the project?**
- Do you have any other comments about the feasibility of the project deadline of 6 weeks?**

- **Conclusion:**

- ➔ Using critical path analysis gives the project manager a clear view of a realistic timescale for the project.
- ➔ It makes it very clear which order the activities need to be completed in, and also which activities it is most important to complete in time.
- ➔ Using only two workers is not realistic. It is unlikely that the workers will be skilled in all aspects of the building and renovating trade (including plumbing and electrical work!).
- ➔ The timescale is very tight. There are six activities on the critical path, and a slip of more than a day in total will result in the deadline being missed.
- ➔ It is possible that some activities could be speeded up by having more than one person working, and the property developer would have to weigh up the time saved, against the costs of employing more people.