Tutorial 11 : Production planning

Graph theory, 1st semester.

2022

Exercise 1 — *Build a house*

The following table describes a project to build a house, for each task, the table specifies the duration and the required tasks (the tasks that need to be done before).

		Duration (weeks)	Required tasks
A	Cables laying	4	D
B	Plumbing	2	C,D
C	Foundations	3	-
D	Build the frame	5	C
E	Brickwork	3	D
F	Cover the roof	2	D
G	Cover the walls	3	A,B,D,E
H	General inspection	2	I,J
I	Inside adjustments	3	E,F,G
J	Outside adjustments	3	E,F

1. Draw the MPM diagram corresponding to that project.
2. Some of the required taks are redundant. Delete them.
3. Compute the optimistic and pessimistic times t_i and T_i of each task i.
4. What are the critical paths ?
5. Compute the free float m_i and the total float M_i of each task i.

Exercise 2 — *Movie production*

The following table describes a project to product a movie, for each task, the table specifies the duration and the required tasks (the tasks that need to be done before).

		Duration (days)	Required tasks
A	Write the script	30	
B	Hire the actors	12	A
C	Choose the location of the shooting	8	A
D	Storyboard	4	A,C
E	Build the sets	7	C
F	Shooting	10	A,B,C,D,E
G	Marketing	30	F
H	Editing	14	F
I	Music and sound composition	7	A
J	Mixing	6	H, I

1. Draw simultaneously a MPM and a PERT diagram corresponding to that project.
2. Some of the required taks are redundant. Delete them.
3. Compute the optimistic and pessimistic times t_i and T_i of each task i.
4. What are the critical paths ?
5. Compute the free float m_i and the total float M_i of each task i.