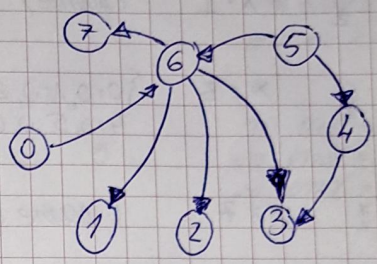
Manual Execution - DAG & Topological Sorting

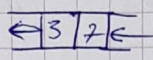
Activity	Duration	Predecessor
0	1	-
1	2	6
2	1	3, 6
3	2	4, 6
4	1	5
5	2	-
6	5	0, 5
7	1	6

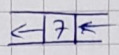
Corresponding Graph

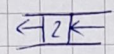


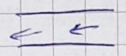
Topological Sorting

	x, y	count {}	queue	sorted []
init:		{0:0, 1:1, 2:2, 3:2, 4:1, 5:0, 6:2, 7:1}	← 0 | 5 ←	[]
1st:	x = 0 y = 6	{0:0, 1:1, 2:2, 3:2, 4:1, 5:0, 6:1, 7:1}	← 5 ←	[0]
2nd:	x = 5 y = 4 y = 6	{0:0, 1:1, 2:2, 3:2, 4:0, 5:0, 6:1, 7:1} → 6:0	← 4 ← ← 4 | 6 ←	[0,5]
3rd:	x = 4 y = 3	{0:0, 1:1, 2:2, 3:1, 4:0, 5:0, 6:0, 7:1}	← 6 ←	[0,5,4]
4th:	x = 6 y = 1 y = 2 y = 3 y = 7	{0:0, 1:0, 2:2, 3:1, 4:0, 5:0, 6:0, 7:1} → 2:1 → 3:0 → 7:0	← ← 1 ← ← 1 | 3 ← ← 1 | 3 | 7 ←	[0,5,4,6]

5 x=1 (same)  [0,5,4,6,1]

6 x=3 {0:0, 1:0, 2:0, 3:0, 4:0, 5:0, 6:0, 7:0}  [0,5,4,6,1,3]

7 x=7 (same as 6)  [0,5,4,6,1,3,7]

8 x=2 (same as 6 & 7)  [0,5,4,6,1,3,7,2]

The graph is a DAG with size equal to 8.

Computing the earliest scheduling

sorted[7] : [0,5,4,6,1,3,7,2]

prerequisites { 0: inf, 1: [6], 2: [3,6], 3: [4,6], 4: [5], 5: inf, 6: [0,5], 7: [6] }

auxiliary_durations = [0 1 2 3 4 5 6 7 / 1 2 1 2 1 2 5 1] = durations

auxiliary_durations → used for maximum durations(end) as aux_duration[prerequisites][7]

durations : [x, 0]

x	preq	aux_durations	duration	max.end
		0 1 2 3 4 5 6 7		
0	inf	[7, 2, 1, 2, 1, 2, 5, 1]	1	
		↳ 0 [0]		
		↳ 0 [0,1]		
		0 1 2 3 4 5 6 7		
5	inf	[0,1], 2, 1, 2, 1, [7], 5, 1	2	
		↳ 5 [0,2]		

X	preceq	aux_durations	duration	max. end
4	5	[0,1], 2, 1, 2, [2,3], [0,2], 5, 1	1	m.end = 0 m_end = 2
6	[0,5]	[0,1], 2, 1, 2, [2,3], [0,2], 5, 1 → [2,7]	5	m. end = 0 m_end = 1 m. end = 2
1	6	[[0,1], [7,9], 1, 2, [2,3], [0,2], [3,7], 1]	2	m.end = 0 m.end = 7
3	4, 6	[[0,1], [7,9], 1, [7,9], [2,3], [0,2], [2,7], [7,8]]	1	m.end = 0 m end = 5 m. end = 7
7	6	~~[[0,1], [7,9], [2,3], [0,2], [2,7], [7,8]]~~ [[0,1], [7,9], 1, [7,9], [2,3], [0,2], [2,7], [7,8]]	1	m.end = 0 m.end = 7
2	3,6	[[0,1], [7,9], [9,10], [7,9], [2,3], [0,2], [2,7], [7,8]]	1	m.end = 0 m_end = 9

The earliest scheduling

0 : 0 1
1 : 7 9
2 : 9 10
3 : 7 9
4 : 2 3
5 : 0 2
6 : 2 7
7 : 7 8

project duration → 10

The latest scheduling

0 : 1 2
1 : 8 10
2 : 9 10
3 : 7 9
4 : 6 7
5 : 0 2
6 : 2 7
7 : 9 10

Critical activities:
2, 3, 5, 6