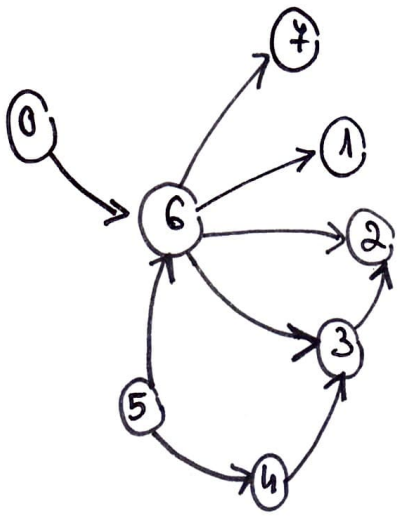
ACTIVITATE	DURATA EXECUTIEI	ACTIVITAȚI PRECEDENTE
0	1	—
1	2	6
2	1	3, 6
3	2	4, 6
4	1	5
5	2	—
6	5	0, 5
7	1	6

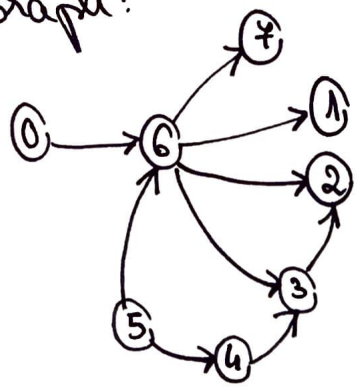
The corresponding graph for the project:



Topological sorting using predecessor counting algorithm

Graph:

G_1:



	x, y	count: dictionary	q: queue	sorted: list
initialization		0 1 2 3 4 5 6 7 0 1 2 2 1 0 2 1	← | 0 | 5 | ←	[]
iteration 1	x=0 y=6	0 1 2 3 4 5 6 7 0 1 2 2 1 0 1 1	← | 5 | ←	[0]
iteration 2	x=5 y=4 y=6	0 1 2 3 4 5 6 7 0 1 2 2 0 0 1 1 0 1 2 3 4 5 6 7 0 1 2 2 0 0 0 1	← ← ← | 4 | ← ← | 4 | 6 | ←	[0,5]
iteration 3	x=4 y=3	0 1 2 3 4 5 6 7 0 1 2 1 0 0 0 1	← | 6 | ←	[0,5,4]
iteration 4	x=6 y=1 y=2 y=3 y=7	0 1 2 3 4 5 6 7 0 0 2 1 0 0 0 1 0 1 2 3 4 5 6 7 6 0 1 1 0 0 0 1 0 1 2 3 4 5 6 7 0 0 1 0 0 0 0 1 0 1 2 3 4 5 6 7 0 0 1 0 0 0 0 0	← ← ← | 1 | ← ← | 1 | 3 | ← ← | 1 | 3 | 7 | ←	[0,5,4,6]
iteration 5	x=1	the same as before	← | 3 | 7 | ←	[0,5,4,6,1]
iteration 6	x=3 y=2	0 1 2 3 4 5 6 7 0 0 0 0 0 0 0 0	← | 7 | ← ← | 7 | 2 | ←	[0,5,4,6,1,3]
iteration 7	x=7	the same as before	← | 2 | ←	[0,5,4,6,1,3,7]
iteration 8	x=2	the same as before	← ← stop	[0,5,4,6,1,3,7,2]

G_1 is a DAG and the size of the sorted is: 8

Algorithm for computing the earliest scheduling

sorted = [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]}

prerequisites

auxiliary_durations[ ][1]

	0	1	2	3	4	5	6	7
auxiliary_durations =	1	2	1	2	1	2	5	1
durations =	1	2	1	2	1	2	5	1

durations[X][0]

	X	prerequisites	auxiliary durations: dict	duration	maximum end
iteration 1	X = 0	inf	0 1 2 3 4 5 6 7 [ ] 2 1 2 1 2 5 1 0 1 2 3 4 5 6 7 [0] 2 1 2 1 2 5 1 0 1 2 3 4 5 6 7 [0,1] 2 1 2 1 2 5 1	d = 1	
iteration 2	X = 5	inf	0 1 2 3 4 5 6 7 [0,1] 2 1 2 1 [ ] 5 1 0 1 2 3 4 5 6 7 [0,1] 2 1 2 1 [0,2] 5 1	d = 2	
iteration 3	X = 4	5	0 1 2 3 4 5 6 7 [0,1] 2 1 2 [2,3] [0,2] 5 1	d = 1	me = 0 me = 2
iteration 4	X = 6	[0, 5]	0 1 2 3 4 5 6 7 [0,1] 2 1 2 [2,3] [0,2] [2,7] 1	d = 5	me = 0 me = 1 me = 2
iteration 5	X = 1	6	0 1 2 3 4 5 6 7 [0,1] [7,9] 1 2 [2,3] [0,2] [2,7] 1	d = 2	me = 0 me = 7
iteration 6	X = 3	4, 6	0 1 2 3 4 5 6 7 [0,1] [7,9] 1 [7,9] [2,3] [0,2] [2,7] 1	d = 2	me = 0 me = 3 me = 7
iteration 7	X = 7	6	0 1 2 3 4 5 6 7 [0,1] [7,9] 1 [7,9] [2,3] [0,2] [2,7] [7,8]	d = 1	me = 0 me = 7
iteration 8	X = 2	3, 6	0 1 2 3 4 5 6 7 [0,1] [7,9] [3,10] [7,9] [2,3] [0,2] [2,7] [7,8]	d = 1	me = 0 me = 9

Algorithm for computing the latest scheduling project duration = 10 durations[x][0]

	x	sem	key	preq[key]	val	auxiliary durations	y	preq[y]	val 2	maximum	duration
it. 1	2	1	0	inf							
			1	6	6						
			2	3,6	3						
					6						
			3	4,6	4						
					6						
			4	5	5						
			5	inf							
			6	0,5	0						
					5						
			7	6	6	0 1 2 3 4 5 6 7 1 | 2 | 9,10 | 2 | 1 | 2 | 5 | 1					$\lambda = 1$
it. 2	7	1	0	inf							
			1	6	6						
			2	3,6	3						
					6						
			3	4,6	4						
					6						
			4	5	5						
			5	inf							
			6	0,5	0						
					5						
			7	6	6	0 1 2 3 4 5 6 7 1 | 2 | 9,10 | 2 | 1 | 2 | 5 | 9,10					$\lambda = 1$
it. 3	3	1	0	inf							
			1	6	6						
		0	2	3,6	3						
					6						
			3	4,6	4						
					6						
			4	5	5						

	x	sem	key	pcsg[key]	val	auxiliary durations	y	pcsg[y]	val2	maximum	duration
it.3	3	0	5	inf							
			6	0,5	0						
			4	6	5		2	3,6	3	m = 11	
					6					m = 9	
							4	6	6		
									6		
							3	4,6	4		
									6		
							1	6	6		
							6	0,5	0		
									5		
							4	5	5		
						0 1 2 3 4 5 6 7	5	inf			
						1 2 9,10 7,9 1 2 5 9,10	0	inf			d = 2
it.4	1	1	0	inf							
			1	6	6						
			2	3,6	3						
					6						
			3	4,6	4						
					6						
			4	5	5						
			5	inf							
			6	0,5	0						
					5						
			7	6	6	0 1 2 3 4 5 6 7					
						1 8,10 9,10 7,9 1 2 5 9,10					d = 2
it.5	6	1	0	inf							
		0	1	6	6						
			2	3,6	3						
		0			6						
			3	4,6	4						
		0			6						
			4	5	5						
			5	inf							

	x	sem	key	preg[key]	val	auxiliary durations	y	preg[y]	val2	maximum	duration
it.5	6	0	6	0,5	0						
		0	7	6	5						
					6		2	3,6	3	m = 11	
									6	m = 9	
							7	6	6		
							3	4,6	4		
									6	m = 7	
							1	6	6		
							6	0,5	0		
									5		
							4	5	5		
						0 1 2 3 4 5 6 7	5	inf			
						1 | 8,10 | 9,10 | 4,9 | 1 | 2 | 2,7 | 9,10	0	inf			d = 5
it.6.	4	1	0	inf	6						
			1	6	3						
			2	3,6	6						
		0	3	4,6	4						
					6						
			4	5	5						
			5	inf							
			6	0,5	0						
			7	6	5						
					6		2	3,6	3	m = 11	
									6		
							7	6	6		
							3	4,6	4	m = 7	
									6		
							1	6	6		
							6	0,5	0		
									5		
							4	5	5		
						0 1 2 3 4 5 6 7	5	inf			
						1 | 8,10 | 9,10 | 4,9 | 6,7 | 2 | 2,7 | 9,10	0	inf			d = 1

	x	sem	key	peeq[key]	val	auxiliary durations	y	peeq[y]	val 2	maximum	duration
it 4.	5	1	0	inf	6						
			1	6	3						
			2	3, 6	6						
			3	4, 6	4						
					6						
		0	4	5	5						
			5	inf	0						
			6	0, 5	5						
		0	7	6	6		2	3, 6	3	m = 11	
									6		
							7	6	6		
							3	4, 6	4		
									6		
							1	6	6		
							6	0, 5	0		
									5	m = 2	
							4	5	5		
						0 1 2 3 4 5 6 7	5	inf			d = 2
						1 [0,10] [9,10] [7,9] [6,7] [0,2] [2,7] [9,10]	0	inf			
it. 8	0	1	0	inf	6						
			1	6	3						
			2	3, 6	6						
			3	4, 6	4						
					6						
			4	5	5						
			5	inf	0						
		0	6	0, 5	5						
			7	6	6						

	x	sem	key	preg[key]	val	auxiliary durations	y	preg[y]	val 2	minimum	duration
	0	0					2	3, 6	3	m = 11	
									6		
it. 8							4	6	6		
							3	4, 6	4		
									6		
							1	6	6		
							6	0, 5	0	m = 2	
									5		
							4	5	5		
						0 1 2 3 4 5 6 7	5	inf			
						1,2 | 8,10 | 9,10 | 7,9 | 6,7 | 0,2 | 2,7 | 9,10	0	inf			d = 1
						STOP					

The earliest scheduling:

project duration = 10

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

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

The critical activities:

2, 3, 5, 6