Lab 4 | Topological sort using the DFS algorithm

Dictionary-in : {0: [ ]; 1: [2, 4], 2: [0, 5], 3: [5], 4: [2, 3], 5: [0], 6: [0], 7: [1, 2, 6]}

Dictionary-out: {0: [5, 2]; 1: [7], 2: [1, 4, 7], 3: [4]; 4: [1], 5: [2], 6: [7], 7: [ ]}

Dict-costs: {(0, 6): 4, (0, 2): 5, (0, 5): 2, (5, 2): 12, (5, 3): 6, (3, 4): 6, (2, 4): 4, (4, 1): 2, (2, 1): 1, (1, 7): 8, (2, 7): 9, (6, 7): 3}

calls / situations	node	sorted-list	visited	visiting	result	other-node
initialization		[ ]	{ }	{ }		
DFS(0, [ ], { }, { })	0	[ ]	{ }	{0}		
	0	[0]	{0}	{ }	Tree	
	1	[0]	{0}	{1}		2
DFS(1)	3	[0]	{0}	{1, 3}		0 (visited), 5
↳ DFS(2)	5	[0]	{0}	{1, 3, 5}		0 (visited
↳ DFS(5)	1	[0, 5, 3]	{0, 5, 3}	{1}	True	4
	4	[0, 5, 3]	{0, 5, 3}	{1, 4}		3
↳ DFS(4)	3	[0, 5, 3]	{0, 5, 3}	{1, 4, 2}		5 (visited)
	1	[0, 5, 3, 2, 4, 1]	{0, 5, 3, 3, 4, 1}	{ }	True	
	2-5	[0, 5, 3, 2, 4, 1]	{0, 5, 3, 2, 4, 1}	{ }		visited
DFS(6)	6	[0, 5, 3, 2, 4, 1]	{0, 5, 3, 2, 4, 1}	{6}		0 (visited
	7	[0, 5, 3, 2, 4, 1, 6]	{0, 5, 3, 2, 4, 1, 6}	{ }	True	

calls/situations	node	sorted_list	visited	visiting	result	other_node	
DFS(7)	7	[0,5,3,2,4,1,6]	{0,5,3,2,4,1,6}	{7}		6; 3; 4	visited
	7	[0,5,3,2,4,1,6,7]	{0,5,3,2,4,1,6,7}	{}	True		
return	sorted_list = [0,5,3,2,4,1,6,7]						

Highest cost path between 2 vertices:

start_vertex = 0

end_vertex = 3

situations	vertex	dist	prev	other node	topsort_list
initialization		0 1 2 3 4 5 6 7 0 -∞ -∞ -∞ -∞ -∞ -∞ -∞	0 1 2 3 4 5 6 7 -1 -1 -1 -1 -1 -1 -1 -1		[0,5,3,2,4,1,6,7]
iteration 1	0	0 1 2 3 4 5 6 7 0 -∞ 3 -∞ -∞ -∞ 4 -∞	0 1 2 3 4 5 6 7 -1 -1 0 -1 -1 -1 0 -1	2	-11-
	0	0 1 2 3 4 5 6 7 0 -∞ 3 -∞ -∞ -∞ 4 -∞	0 1 2 3 4 5 6 7 -1 -1 0 -1 -1 -1 0 -1	6	-11-
	0	0 1 2 3 4 5 6 7 0 -∞ 5 -∞ -∞ 2 4 -∞	0 1 2 3 4 5 6 7 -1 -1 0 -1 -1 0 0 -1	5	-11-
iteration 2	5	0 1 2 3 4 5 6 7 0 -∞ 14 -∞ -∞ 2 4 -∞	0 1 2 3 4 5 6 7 -1 -1 5 -1 -1 0 0 -1	2	-11-
	5	0 1 2 3 4 5 6 7 0 -∞ 14 8 -∞ 2 4 -∞	0 1 2 3 4 5 6 7 -1 -1 5 5 -1 0 0 -1	3	-11-
iteration 3	3	0 1 2 3 4 5 6 7 0 -∞ 14 8 -∞ 2 4 -∞	0 1 2 3 4 5 6 7 -1 -1 5 5 -1 0 0 -1	break	-11-
return	dist[end_vertex] = 8 , prev = 0 1 2 3 4 5 6 7 -1 -1 5 5 -1 0 0 -1				Rāgyuktā Radu 9 e6