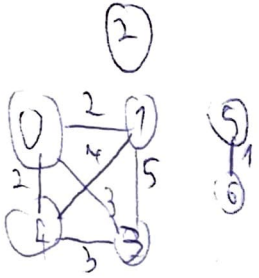
LAB 2 — Find the connected components of an undirected graph using DFS



Neighbors dictionary

key – value

key	value
0	[1,3,4]
1	[0,3,4]
2	~~[0,1,1]~~ []
3	[0,1,4]
4	[0,1,3]
5	[6]
6	[5]

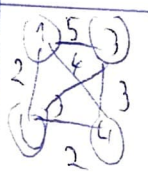
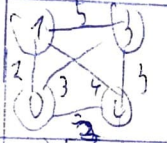
Used dictionary

key – value

key	value
(0,1)	2
(1,0)	2
(0,3)	3
(3,0)	3
(0,4)	2
(4,0)	2

key – value

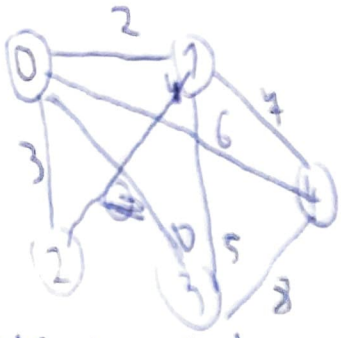
key	value
(1,3)	5
(3,1)	5
(1,4)	4
(4,1)	4
(3,4)	3
(4,3)	3
(5,6)	1
(6,5)	1

	vertex	neighbor	dfs. stack	component	visited
call dfs(0)	—	—	[0]	—	{}
	0	1 3 4	[1,3,4]	⓪	{0: True}
	4	0 1 3	[1,3,3]	⓪—④	{0: True, 4: True}
	3	0 1 4	[1,3,1]		{0: True 4: True, 3: True}
	1	0 3 4	[1,3,1]		{0: True 4: True 3: True 1: True}
	1	4	[1,3]		{0: True, 4: True, 3: True, 1: True}
	3	—	[1]		{0: True, 4: True, 3: True, 1: True}
	1	—	[]		{0: True, 4: True, 3: True, 1: True}

call dfs(2)	—	—	[1]	—	{ }
	2		[ ]	(2)	{2: True}
call dfs(5)	—	—	[5]	—	{ }
	5	6	[6]	(5)	{5: True}
	6	5	[ ]	(5)→(6)	{5: True, 6: True}

LAB 2

Find the connected components of an undirected graph using DFS



Neighbors dictionary

key - value

0	[1, 2, 3, 4]
1	[0, 2, 3, 4]
2	[0, 1]
3	[0, 1, 4]
4	[0, 1, 3]

Costs dictionary

key - value	key - value
(0,1) — 2	(1,2) — 4
(1,0) — 2	(1,3) — 6
(0,2) — 3	(1,3) — 5
(2,0) — 3	(3,1) — 5
(0,3) — 6	(1,4) — 7
(3,0) — 6	(4,1) — 7
(0,4) — 6	(3,4) — 8
(4,0) — 6	(4,3) — 8

	vertex	neighbors	depth stack	component	visited
call dfs(0)	—	—	[0]	—	{}
	0	1 2 3 4	[1,2,4,4]	0	{0: True}
	4	0 1 3	[1,2,3,1,3]	0 6 4	{0: True 4: True}
	3	0 1 4	[1,2,3,1,1]	0 6 4 3	{0: True 4: True 3: True}
	1	0 2 3 4	[1,2,3,1,2]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True}
	2	0 1	[1,2,3,1]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True 2: True}
	1	—	[1,2,3]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True 2: True}
	3	—	[1,2]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True 2: True}
	2	—	[1]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True 2: True}
	1	—	[]	0 6 4 3 2 1	{0: True 4: True 3: True 1: True 2: True}