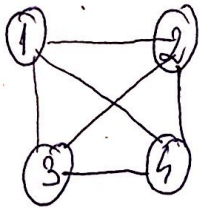
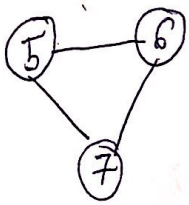
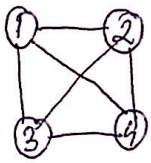
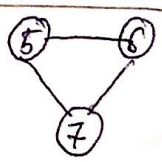
Lab 2 Connected components of an undirected graph using BFS



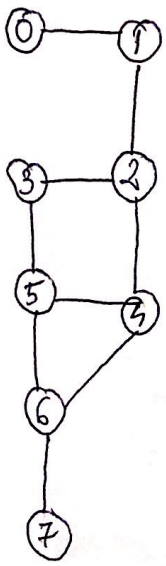


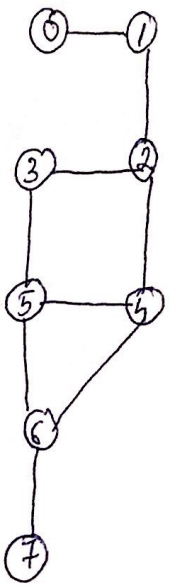
	start vertex	neighbour	queue	vertices in component	visited	the connected component
call BFS(0)	0		0	{0}	{0} ~~1, 2, 3, 4, 5, 6, 7~~	0
call BFS(1)	1	2	~~1~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~	{1}	{0, 1}	
	2	3	2 3 4	{1, 2}	{0, 1, 2}	
	3	4	3 4	{1, 2, 3}	{0, 1, 2, 3}	
	4		4	{1, 2, 3, 4}	{0, 1, 2, 3, 4}	
call BFS(5)	5	6	5 6	{5}	{0, 1, 2, 3, 4, 5}	
	6	7	6 7	{5, 6}	{0, 1, 2, 3, 4, 5, 6}	
	7		7	{5, 6, 7}	{0, 1, 2, 3, 4, 5, 6, 7}	

~~self~~ this → outbound Neighbours

0 - []
1 - [2, 3, 4]
2 - [1, 3, 4]
3 - [1, 2, 4]
4 - [1, 2, 3]
5 - [6, 7]
6 - [5, 7]
7 - [5, 6]

Lab 2 Connected components of an undirected graph using BFS



	start vertex	neighbour	queue	vertices in component	visited	The component
call BFS (0)	0	1	0 1	{0}	{0}	
	1	2	1 2	{0,1}	{0,1}	
	2	3	2 3 4	{0,1,2}	{0,1,2}	
	3	5	3 4 5	{0,1,2,3}	{0,1,2,3}	
	4	5	4 5 6	{0,1,2,3,4}	{0,1,2,3,4}	
	5	6	5 6	{0,1,2,3,4,5}	{0,1,2,3,4,5}	
	6	7	6 7	{0,1,2,3,4,5,6}	{0,1,2,3,4,5,6}	
	7		7	{0,1,2,3,4,5,6,7}	{0,1,2,3,4,5,6,7}	

this->set[second Neighbours

0	→ [1]
1	→ [2]
2	→ [3,4]
3	→ [2,5]
4	→ [2,5,6]
5	→ [4,5,6]
6	→ [5,4]
7	→ [6]

Lab 2 Bonus : Strongly connected components of an directed graph in $O(n+m)$