Answer 1 - 13

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No.1

Components of a graph

- Vertices
- Edges
- Weight (if weighted graph)

No.2

Real-life example of Directed Graph

- Social Networks
- One way trip locations

No.3

Real-life example of Undirected Graph

- Electric Circuit

No.4

When a graph is called “connected”, it means that nodes are connected in a way but not directly.

No.5

When a graph is called “fully connected”, it means that nodes are directly connected to each other.

No.6

Yes, a tree is a connected graph

No.7

A difference between a tree and a graph is that a tree is not interconnected (eg. a node of a tree is only connected to its own parent node and child node) while graph might be interconnected to each other.

No.8

Rooted tree is a tree that has a unique node called root and tree properties.

No.9

A leaf is a node that has no other edge to connected with another node. In other word, the end node.

No.10

In a tree that has n nodes, there are (n-1) edges because root node does not have own edge to parents.

No.11

There is one simple path between a pair of tree nodes.

No.12

A weighted graph is a graph that has edges having weighted which means edges has values.

No.13

a)

Adjacency matrix

	0	1	2	3
0	0	1	0	0
1	1	0	1	1
2	0	1	0	1
3	0	1	1	0

Adjacency List

0	→ 1
1	→ 0, 2, 3
2	→ 1, 3
3	→ 1, 2

b)

Adjacency matrix

	1	2	3	4
1	0	1	1	0
2	0	0	0	0
3	0	1	0	1
4	0	0	1	0

Adjacency List

1	→ 2,3
2	→
3	→ 2,4
4	→ 3

c)

Adjacency matrix

	v1	v2	v3	v4	v5	v6
v1	0	1	1	0	0	0
v2	1	0	1	1	1	0
v3	1	1	0	0	1	0
v4	0	1	0	0	1	1
v5	0	1	1	1	0	1
v6	0	0	0	1	1	0

Adjacency List

v1	→ v2, v3
v2	→ v1, v3, v4, v5
v3	→ v1, v2, v5
v4	→ v2, v5, v6
v5	→ v3, v2, v4, v6
v6	→ v4, v5

d)

Adjacency matrix

	A	B	D	F	N
A	0	1	0	0	0
B	0	0	1	1	0
D	1	0	0	0	0
F	1	0	0	0	1
N	0	1	0	1	0

Adjacency List

A	→ B
B	→ F, D
D	→ A
F	→ N, A
N	→ A, B