DATA STRUCTURES AND ITS APPLICATIONS

Graphs

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DATA STRUCTURES AND ITS APPLICATIONS

Representation of Network Topology

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Applications: Network Topology

Graph data structure is mainly in Computer Networks, Telecommunication, Electronic Circuits and Transport Networks.

Networking uses the Notation G(N,L) instead of G(V,E) for a graph where N is the set of nodes and L is the set of links.

Applications: Network Topology

- Topology is the order in which nodes and edges are arranged in the network.
- How the computers are connected or related to one another in a computer.
- There are 2 types of Topology
  1. Physical
  2. Logical

DATA STRUCTURES AND ITS APPLICATIONS

Applications: Network Topology

- 1.Ring Topology
- 2.Star Topology
- 3.Mesh Topology
- 4.BusTopology

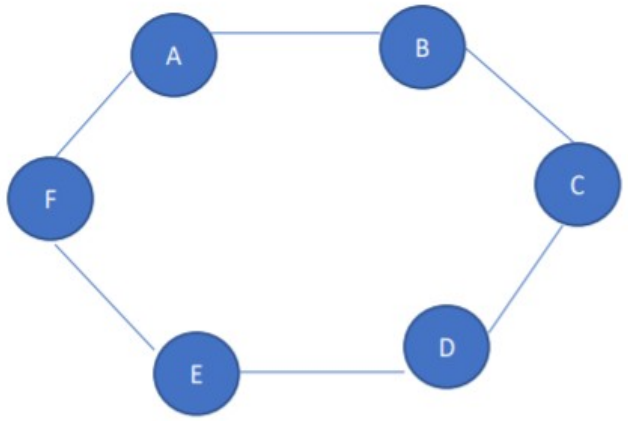
Representation of Graph

1.Adjacency Matrix

2.Adjacency List

Applications: Network Topology

1. Ring topology (cycle): A cycle graph is a simple graph which has two degrees of vertices.



Ring topology

	A	B	C	D	E	F
A	0	1	0	0	0	1
B	1	0	1	0	0	0
C	0	1	0	1	0	0
D	0	0	1	0	1	0
E	0	0	0	1	0	1
F	1	0	0	0	1	0

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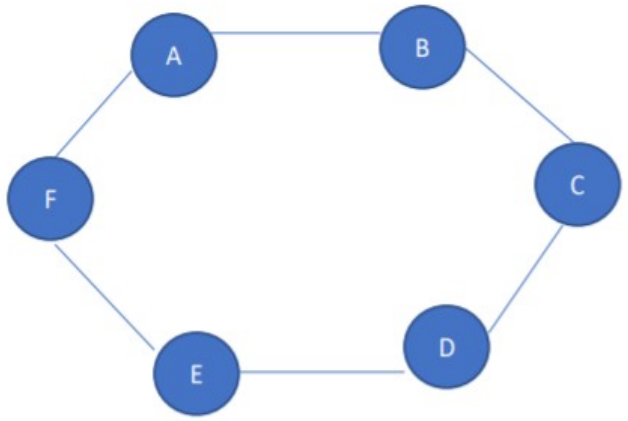
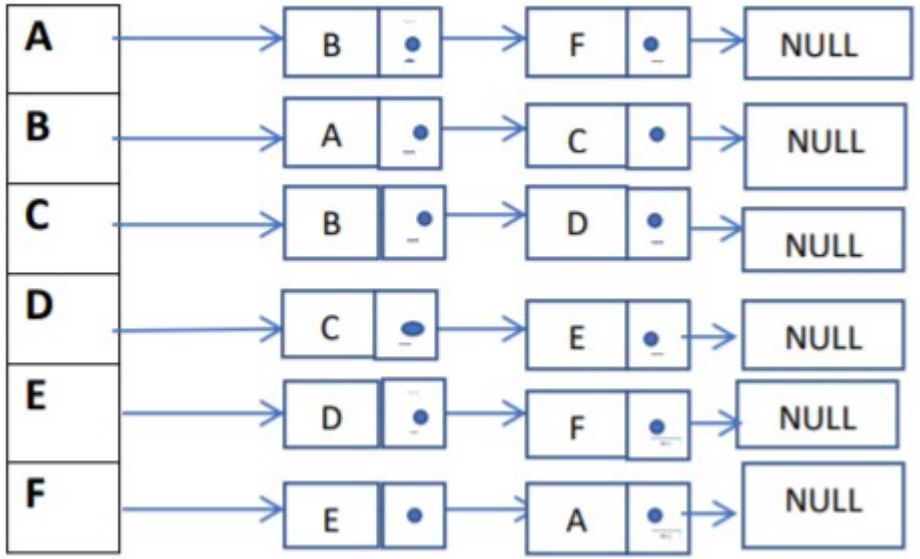
Applications: Network Topology

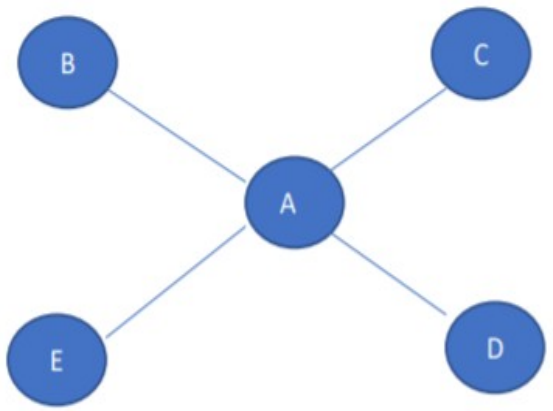


Ring topology



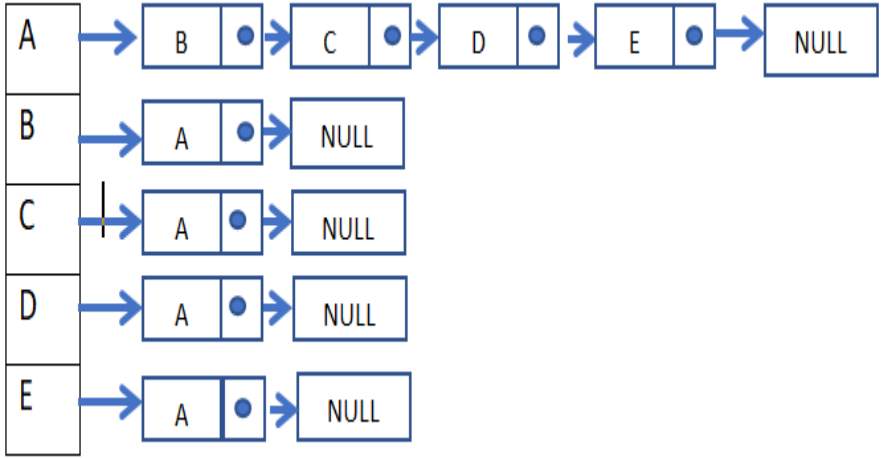
Applications: Network Topology

2.Star topology: Star topology is a network topology in the form of merging from the central vertex to each vertex .



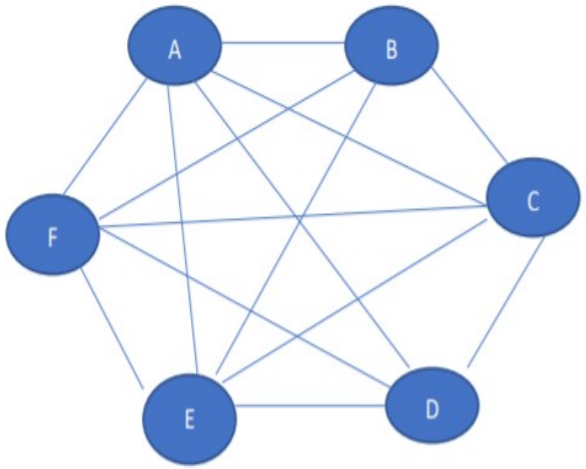
Star topology

	A	B	C	D	E
A	0	1	1	1	1
B	1	0	0	0	0
C	1	0	0	0	0
D	1	0	0	0	0
E	1	0	0	0	0



Applications: Network Topology

3.Mesh topology: Mesh Topology is a complete graph in which all the vertex is connected to all other vertices



Mesh Topology

	A	B	C	D	E	F
A	0	1	1	1	1	1
B	1	0	1	1	1	1
C	1	1	0	1	1	1
D	1	1	1	0	1	1
E	1	1	1	1	0	1
F	1	1	1	1	1	0

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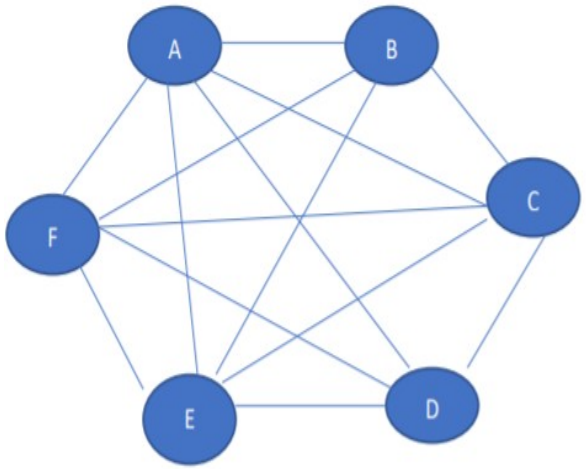
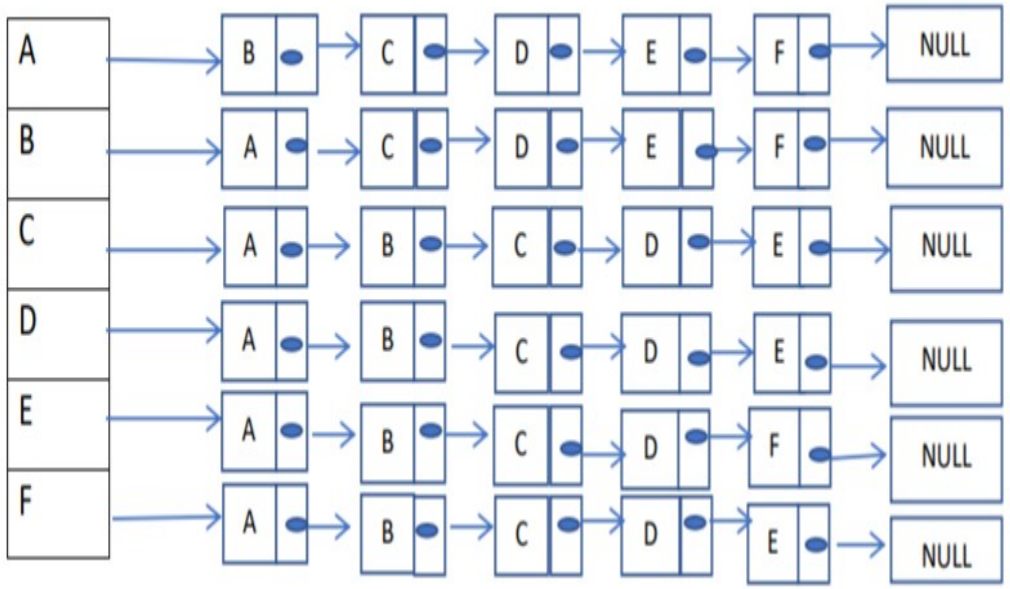


Mesh Topology

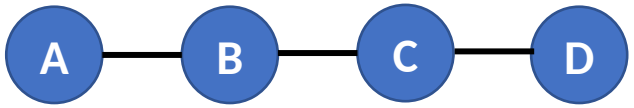


Bus Topology

A Graph G with V vertices is said to represent a bus topology if

1.Every node except the starting and ending node has degree 2 and starting and ending node have degree 1.

2. Number of edges=Number of vertices -1



	A	B	C	D
A	0	1	0	0
B	1	0	1	0
C	0	1	0	1
D	0	0	1	0

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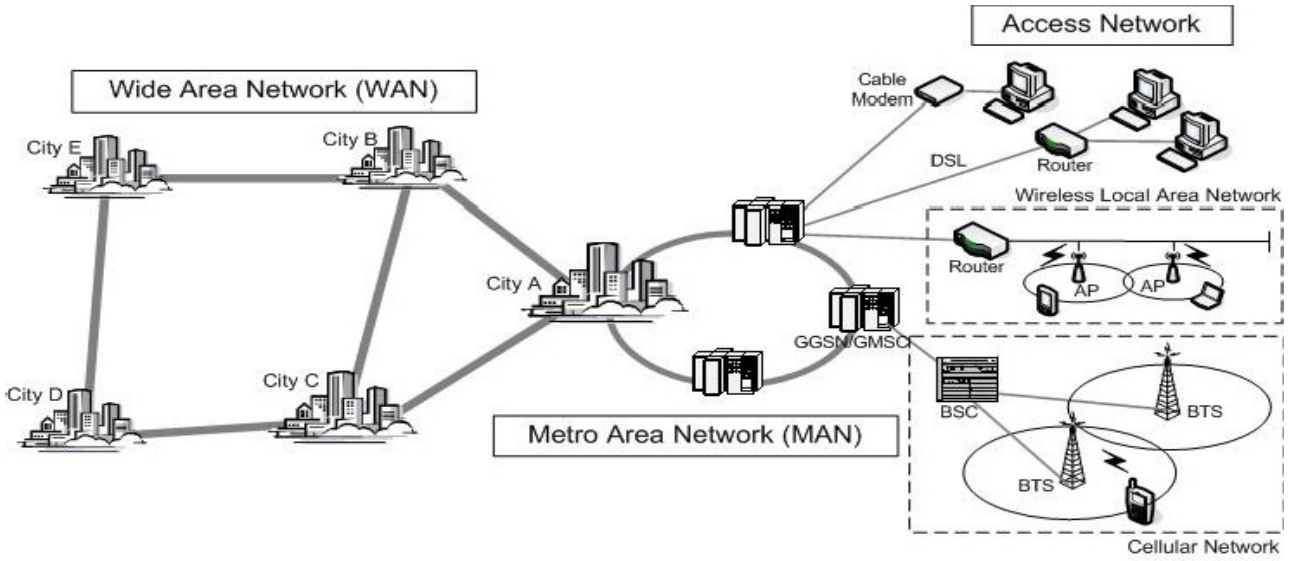
Applications: Network Topology

Most networks a mix of rings, mesh – depending on network type, cost/traffic/reliability



Picture Courtesy: ComputerNetworkTopology.com

THANK YOU

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