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MSA, PMOC, PMP®, PMP®, PMP-ITIL®, CS, ITIL®, MCPD, MCD



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مهم جداً

هذا الملف للمراجعة السريعة واخذ الملاحظات عليه فقط ،لانه يحتوي على اقل من 20٪ مما يتم شرحه في الفيديوهات الاستعجال والاعتماد عليه فقط سوف يجعلك تخسر كميه معلومات وخبرات كثيره

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Algorithms & Problem Solving Level 6

Types of Graphs

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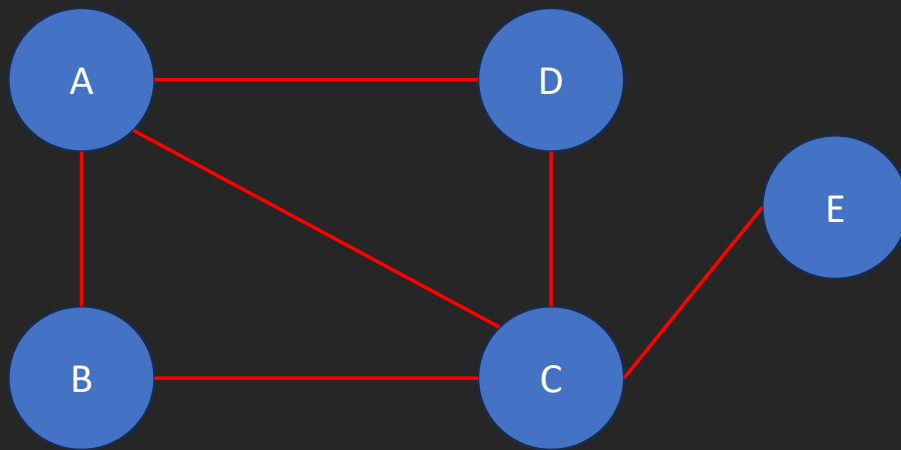
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Types of Graph?

1. Undirected Graph.
2. Directed Graph.
3. Weighted Graph.
4. Unweighted Graph.
5. Cyclic Graph.
6. Acyclic Graph.
7. Dense Graph.
8. Sparce Graph.

1- Undirected Graph

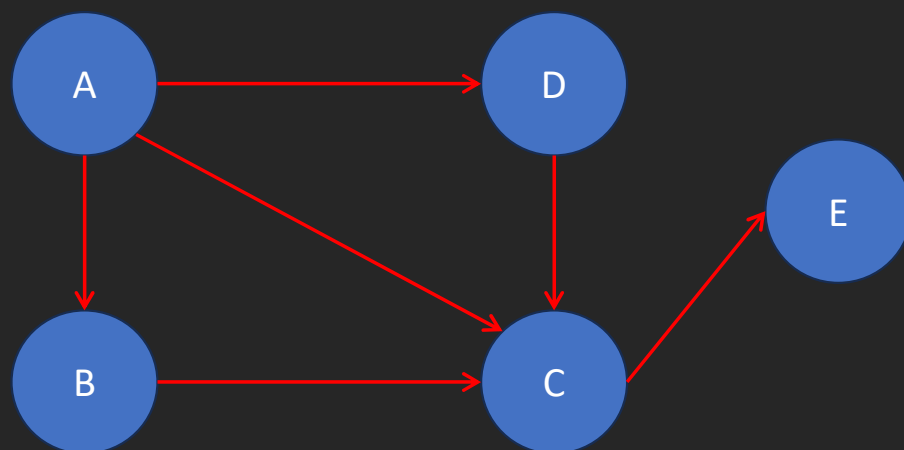


Edges have no direction, meaning the relationship is two-way.

For example, a friendship in a social network.

Example: If an edge connects vertices A and B, it means you can go from A to B and B to A.

2- Directed Graph

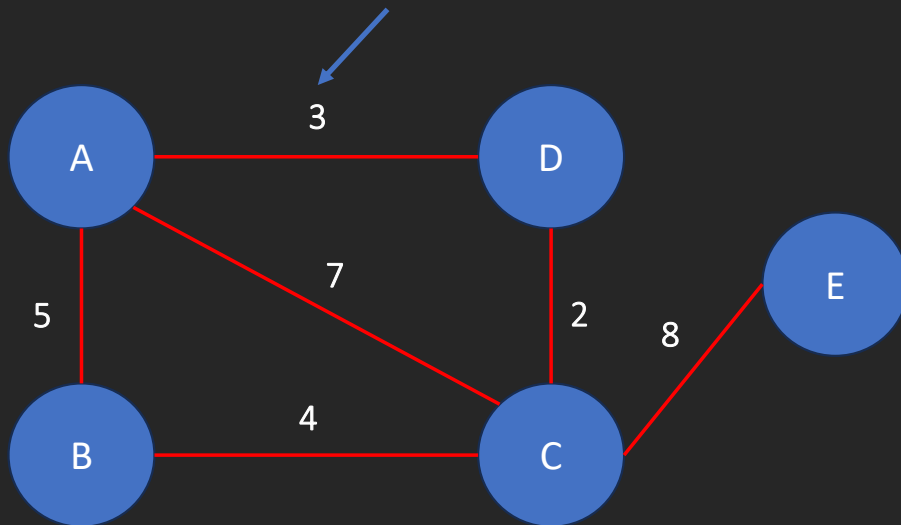


Edges have direction, indicating a one-way relationship. These edges are often represented by arrows.

- Example: A one-way road between two locations, or the "follows" relationship in social media.
- Degree: The number of edges connected to a vertex. In directed graphs, there are:
 - In-degree: Number of incoming edges to a vertex.
 - Out-degree: Number of outgoing edges from a vertex.

3- Weighted Graph

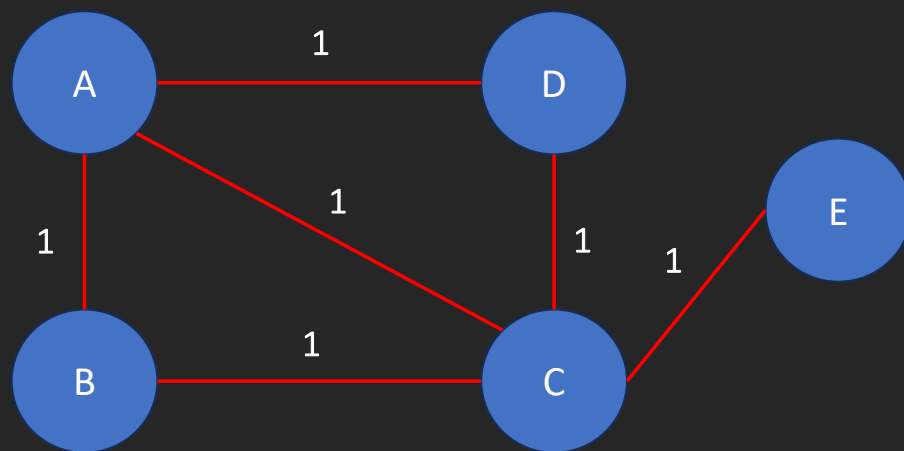
Weight: distance, Time, ..etc



Each edge has an associated weight or cost.

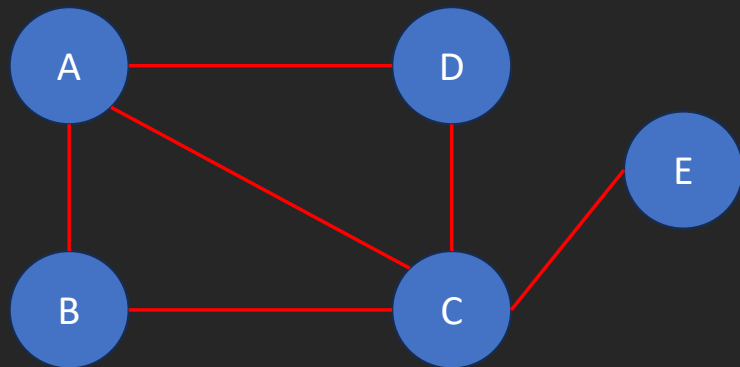
Example: In a map, the edges represent roads, and the weights represent distances or time.

4- Unweighted Graph



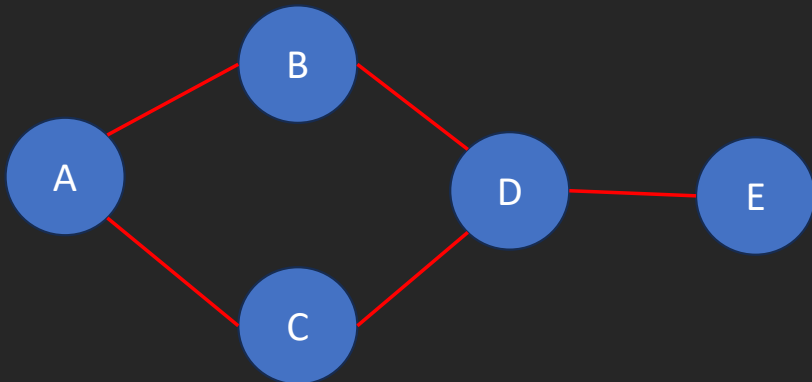
All edges have the same weight, often implicitly set to 1.

5- Cyclic Graph



Contains at least one cycle (a path that starts and ends at the same vertex).

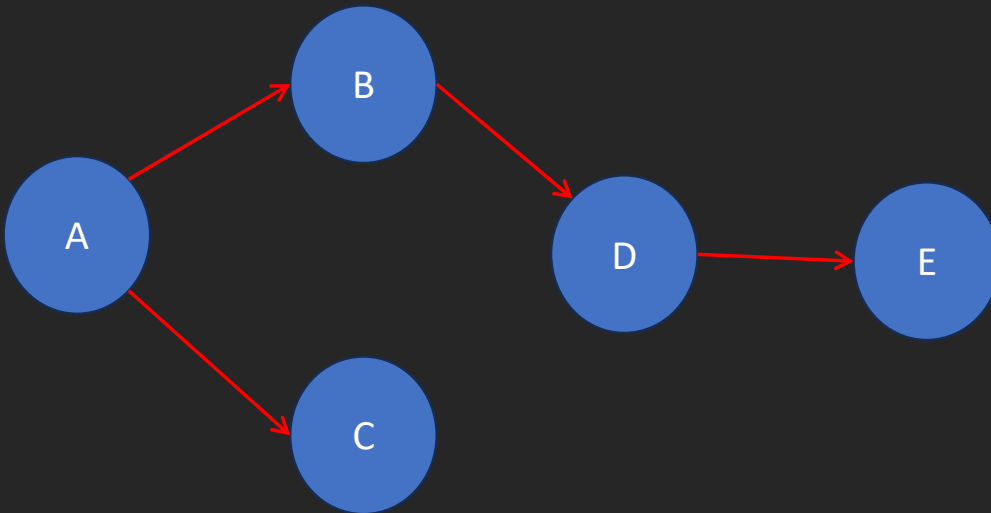
Example in Graph1 : Path (A,D,C,A) is Cycle.



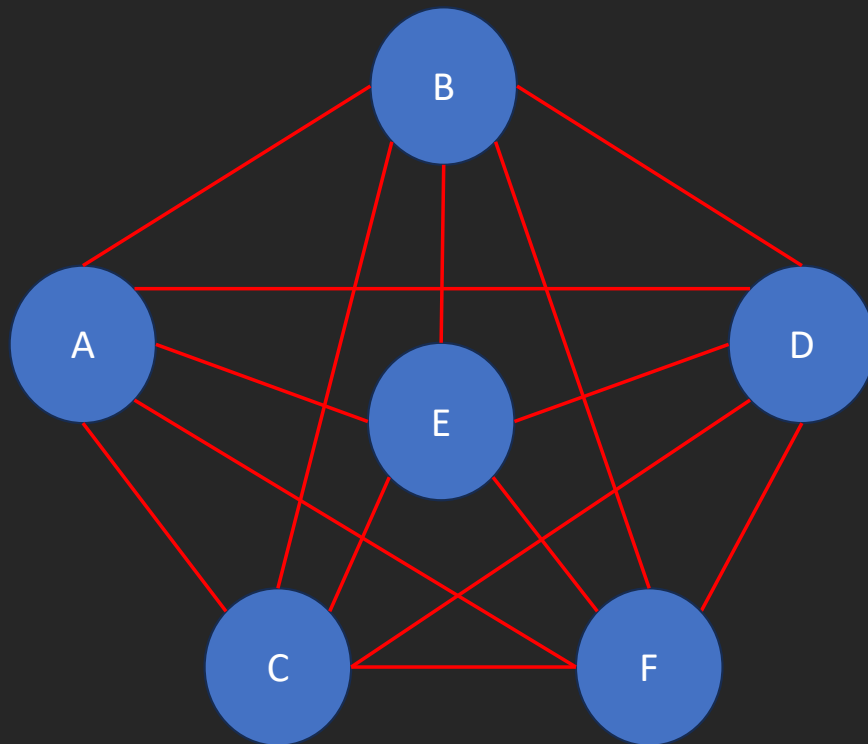
Example2 in Graph2: Path (A,B,D,C,A) is Cycle.

6- Acyclic Graph

Contains no cycles. A special type of acyclic graph is a tree.

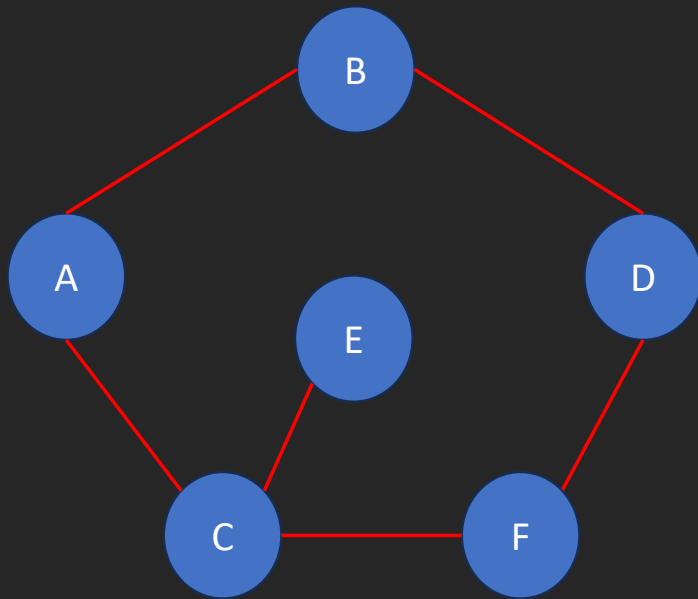


7- Dense Graph



Graphs with a large number of relationships compared to nodes are called dense.

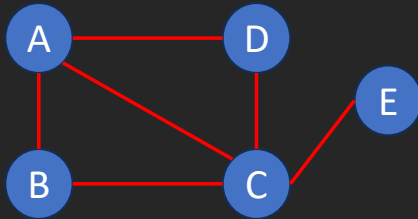
8- Sparse Graph



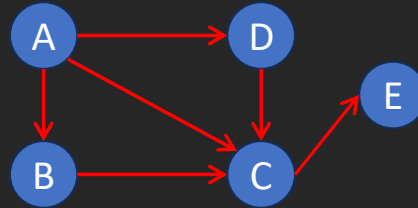
- A sparse graph is a graph in which the number of edges is much lower than the maximum possible number of edges.
- In other words, for a graph with n nodes, a sparse graph has far fewer than $n(n-1)/2$ edges.
- Sparse graphs are the opposite of dense graphs, where the number of edges is close to the maximum possible.
- Examples of sparse graphs include trees and graphs with only a few connections between nodes.
- Sparse graphs are typically more memory-efficient and can be easier to work with in algorithms.

Graph Types Summary:

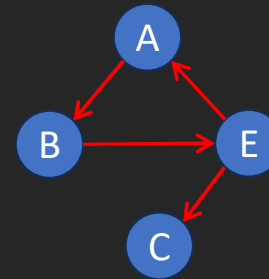
Undirected



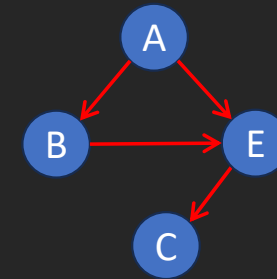
Directed



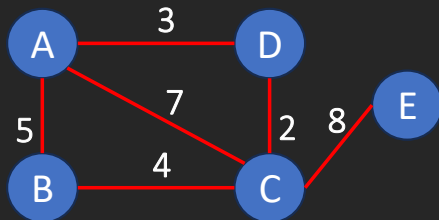
Cyclic



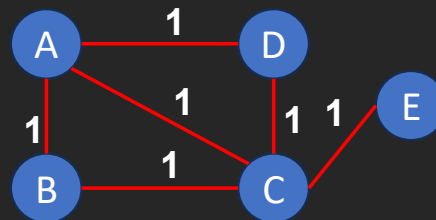
Acyclic



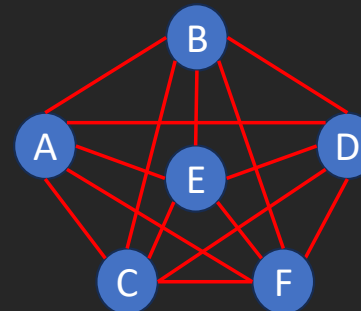
Weighted



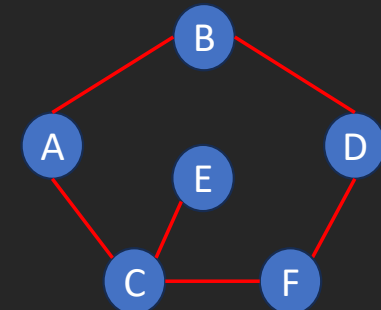
Unweighted



Dense



Sparse





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Thank You

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