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Mohammed Abu-Hadhoud

MSA, PMOC, PMP®, PMP®, PMP-REP®, 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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## Data Structures Level 2

# General Tree

**Mohammed Abu-Hadhoud**

MBA, PMOC, PgMP®, PMP®, PMI-RMP®, CM, ITILF, MCPD, MCSD

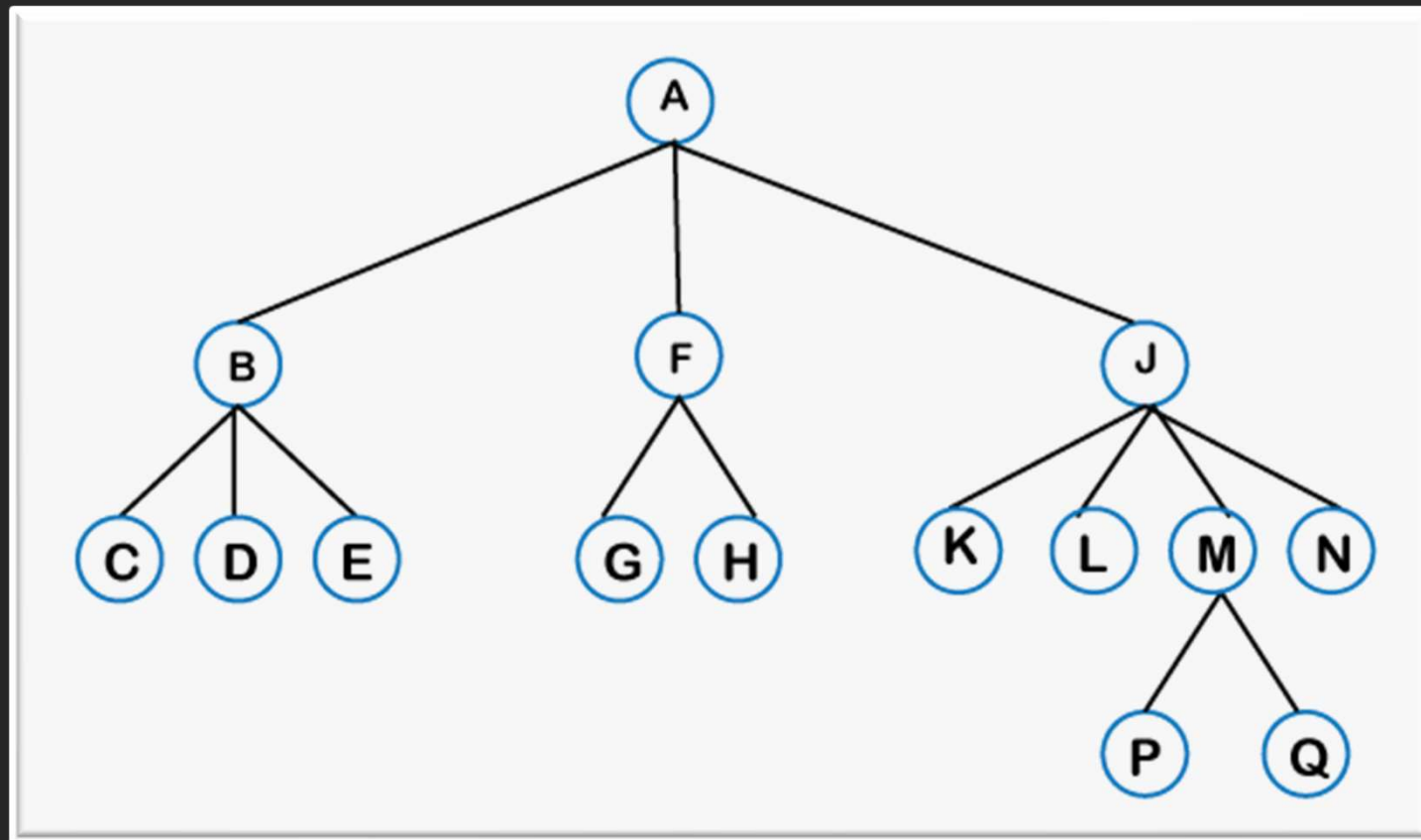


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# What is General Tree?



# What is General Tree?

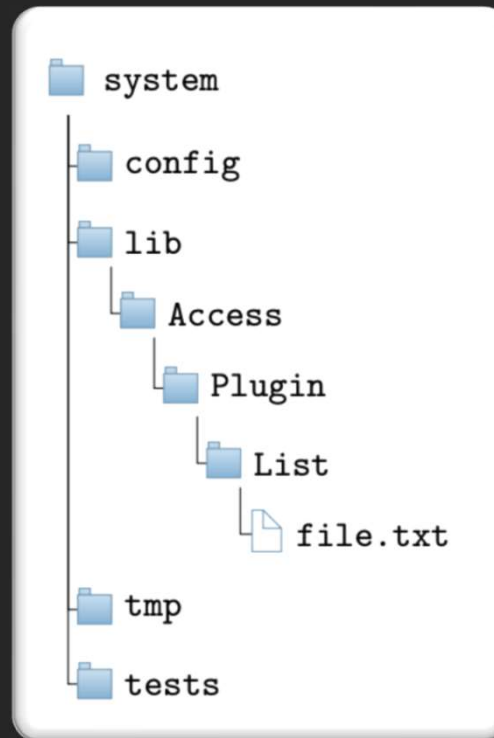
- A General Tree Data Structure, often simply called a "tree," is a non-linear hierarchical data structure that consists of nodes connected by edges.
- A General Tree allows each node to have any number of children. This flexibility makes it suitable for representing more complex hierarchical relationships.
- The general tree is one of the types of tree data structure. In the general tree, a node can have either 0 or maximum n number of nodes.
- There is no restriction imposed on the degree of the node (the number of nodes that a node can contain). The topmost node in a general tree is known as a root node. The children of the parent node are known as subtrees.

# Uses of a General Tree:

General Trees are used in many applications to represent hierarchical relationships, such as:

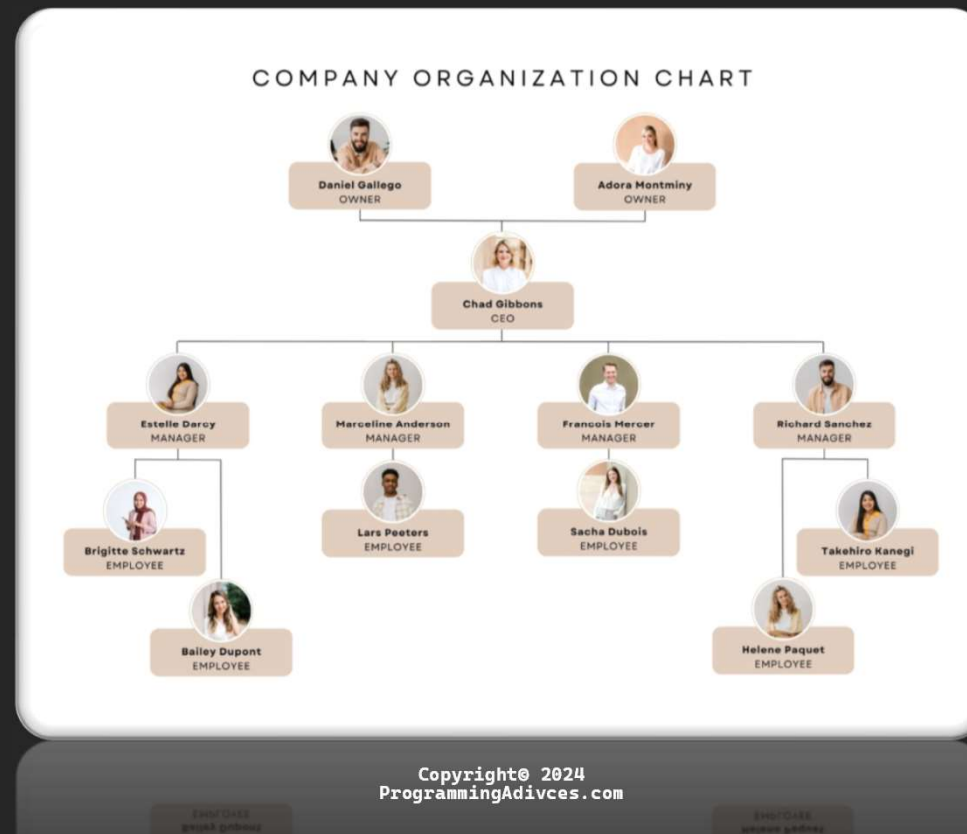
# Uses of a General Tree:

- File Systems: Directories and files in a file system can be represented as a tree, with directories as internal nodes and files as leaves.



# Uses of a General Tree:

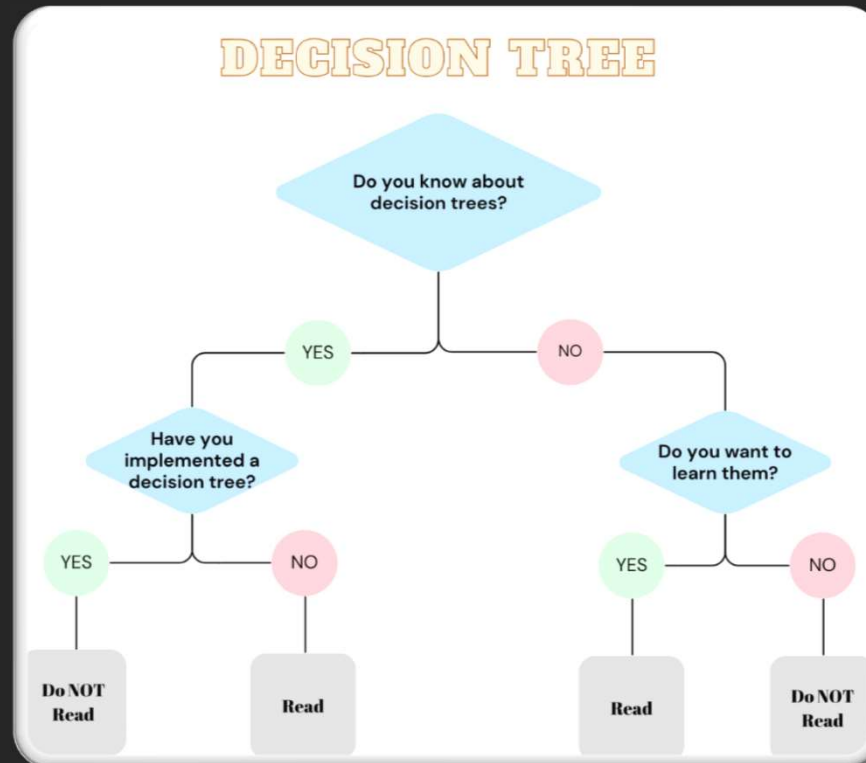
- Organizational Structures: The hierarchical structure of an organization can be represented, showing the relationships between different departments and employees.





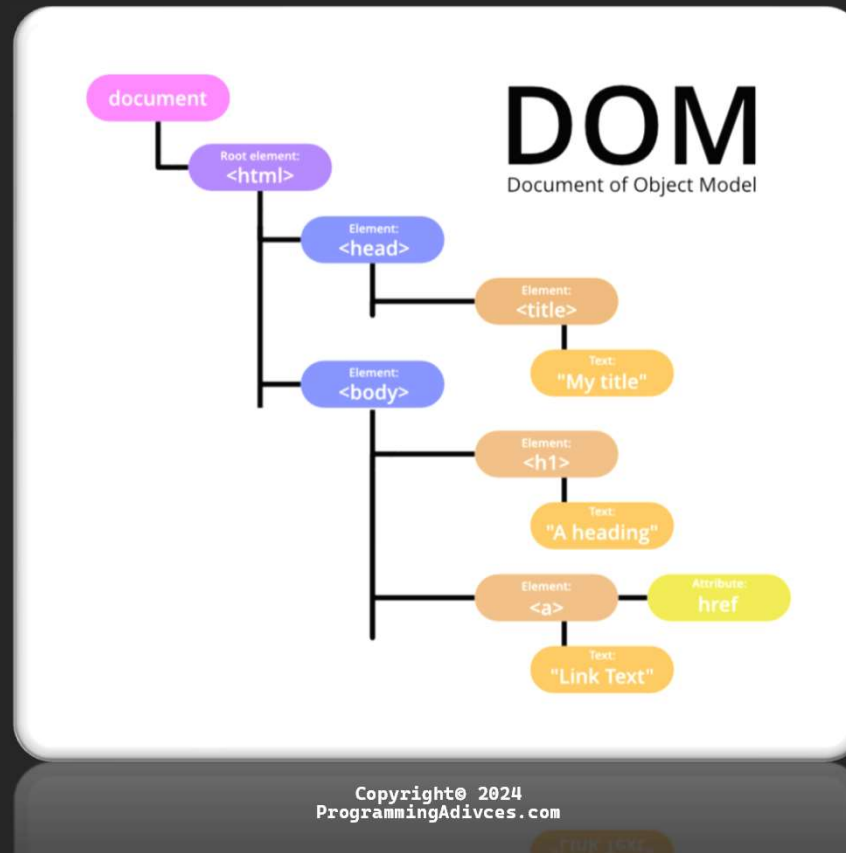
# Uses of a General Tree:

- Decision Trees: Used in decision-making processes and algorithms, including machine learning models for classification and regression.



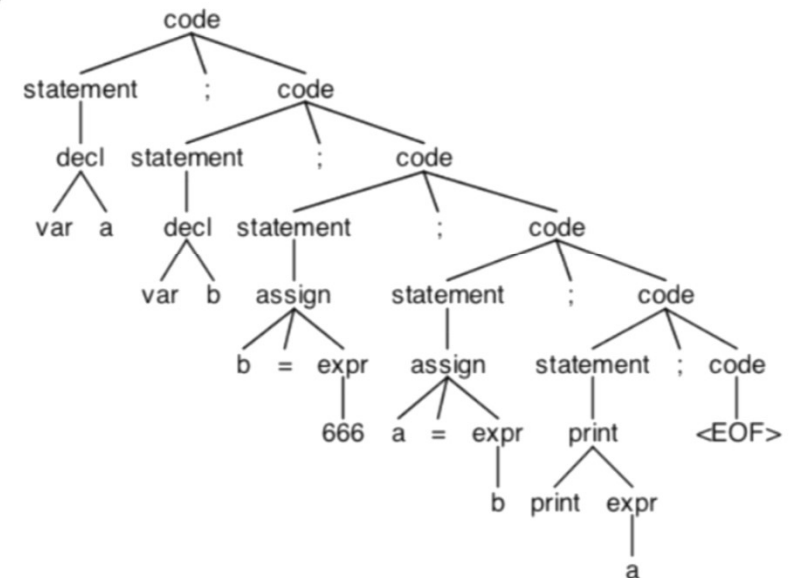
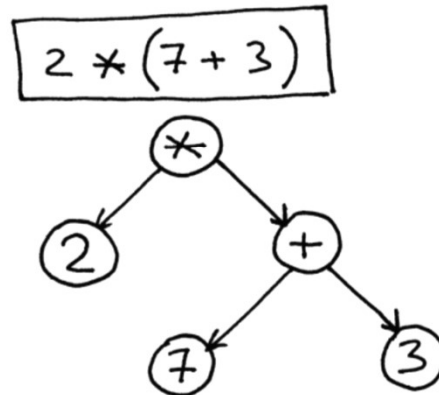
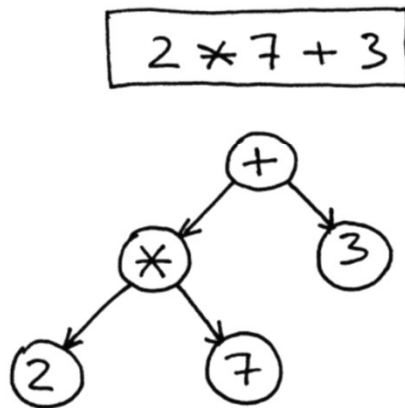
# Uses of a General Tree:

- XML/HTML Documents: The nested tag structure of XML and HTML documents can be represented as a tree, known as the Document Object Model (DOM) for web pages.



# Uses of a General Tree:

- Abstract Syntax Trees (ASTs): In compilers, ASTs are used to represent the syntactic structure of source code.



# Properties of General Tree?

- The General Tree structure is recursive; each subtree of a tree is a tree itself.
- There is no limit on the number of children a node can have, making it a versatile structure for representing complex hierarchies.
- The number of edges in a tree is always one less than the number of nodes, ensuring there are no cycles and that there is a unique path between any two nodes.

In summary, the General Tree Data Structure is a fundamental concept in computer science and software engineering, providing a flexible way to represent hierarchical data across various applications.





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Thank You

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