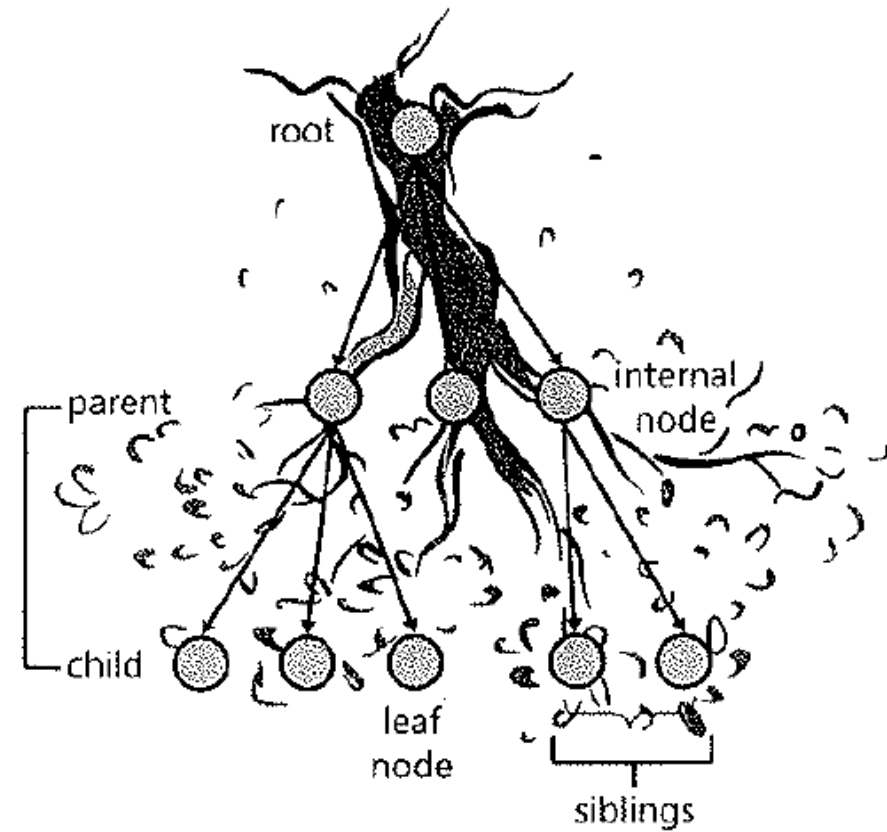# Graph and Recursive Query

Graphs

- Graphs
- Trees
- Hierarchies

Graph Categories

- Directed Graph has direction and order for nodes
  - Latte contains milk
  - Also known as Digraph
- Undirected Graph doesn't have direction and order for nodes
  - Road system
- Acyclic graph has no cycle
  - No path starts and ends at the same node
  - Directed Acyclic Graph is known as DAG
- Cyclic graph has cycle
  - Path starts and ends at the same node

Trees

- A tree is an acyclic graph
- Accessed from top

Hierarchies

- Directed acyclic graph
  - Inheritance in object oriented programming
  - Reporting chain

Graph Processing

- Iterative approach to traverse graph
- One node at a time using cursors and loops
- One level at a time and set-based using loops or recursion
- Loops have more control
- Recursive CTE (Common Table Expression) is less verbose and more elegant