Trees - connected graph with no cycle or self loops

Tree
Not tree
Not tree
Not tree
Tree
Rooted tree

\[ u, v \in E, \text{ if } u \text{ closer to root, } u \text{ is "parent" of } v, \text{ v is "child" of } u. \]

special vertex is called root

distance 1 = children of root

leaves = nodes without children
Q: Consider a family tree where people are vertices, and we put an edge between parent & child. If I am the root, which nodes are child nodes of me?

A) My children  B) My Parents  C) Children & Parents

\[ \text{def: An $k$-ary tree is a rooted tree where every node has at most $k$ children.} \]

Most Famous in Computer Science: Binary Tree \( \|$ 2\text{-ary tree.} \)

Applications:  
- Data structures
- Codes