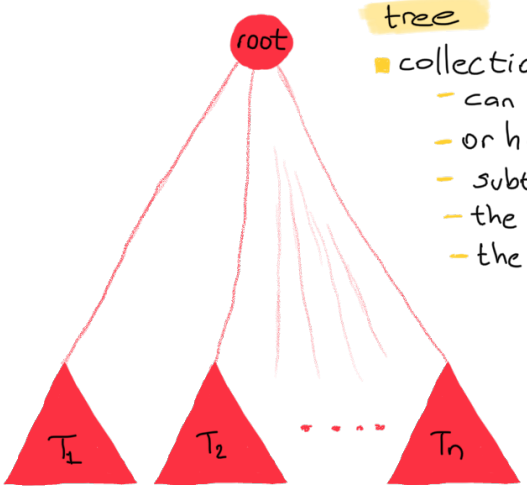
trees



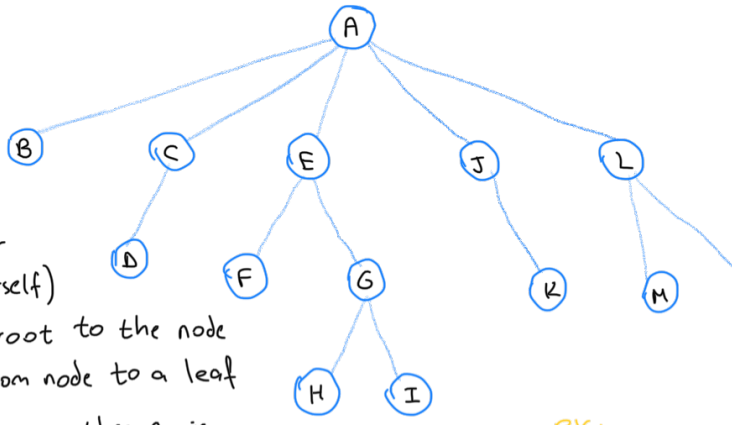
tree

- collection of nodes with properties:
  - can be empty
  - or have a root, and zero or more subtrees $T_1, .. T_n$
  - subtrees are connected to the root by a direct edg
  - the root of a subtree is child
  - the root is the parent of each child.

* there is no cycle
* they are all connected

if a tree has n nodes
it has $n-1$ edges

child: A has 5 children
leaf: B,D,F,H,I,K,M,N are leaves
sibling: F and G are siblings
path: A-E-G-I
• there is exactly one path from the root to each node.
length: of a path is, the number of edges (is zero when it is itself)
depth: lenght of the path from root to the node
height: lenght of longest path from node to a leaf
• if there is a path from n_1 to n_2, then n_1 is ancestor of n_2, and n_2 descendent of n_1. (means n_1 is on the top)
(if $n_1 \neq n_2$ they are proper ancestor & proper descendent)



ex:
depth of G:
height of G: