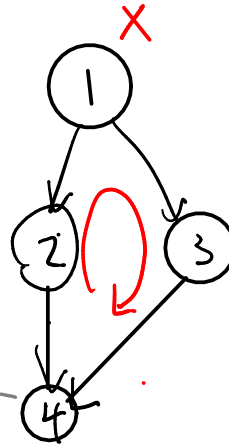
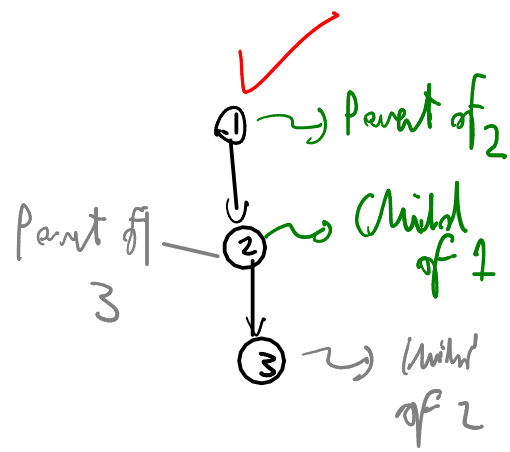


Trees :-

Any graph with no cycles is a type of tree.

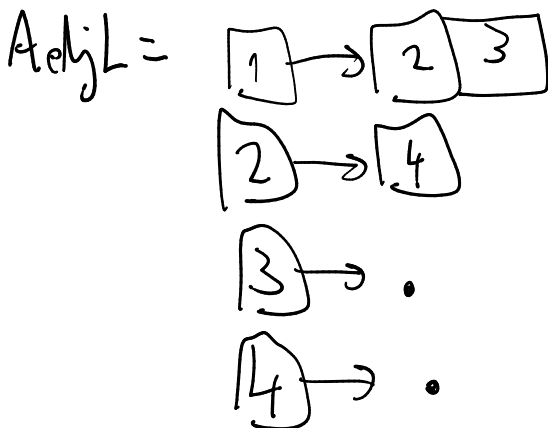
Each node has one or less parents.



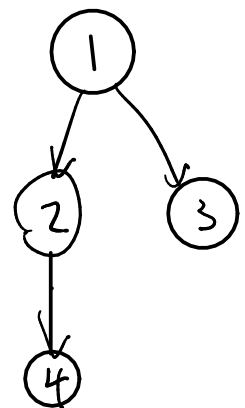
Can not have more than 1 parent. Thus, this is not a tree.

Let's talk about directed trees

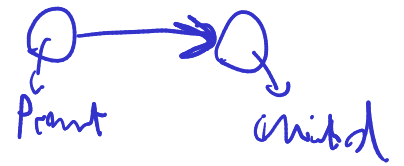
$$\text{AdjM} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \leadsto \text{SPARSE}$$



Predecessor Array.



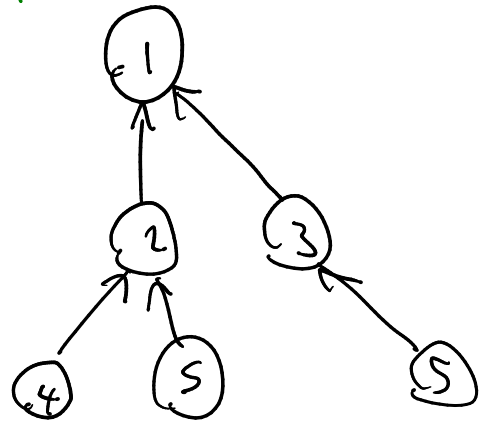
Trees come in many flavors.



Each node has just one child or less.

For this I could use a Successor Array.

Directed-Tree

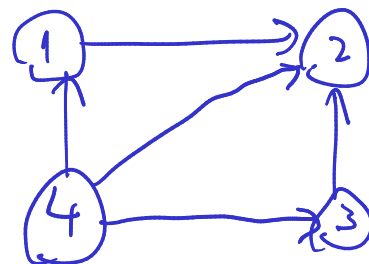


Search!

Reachability.

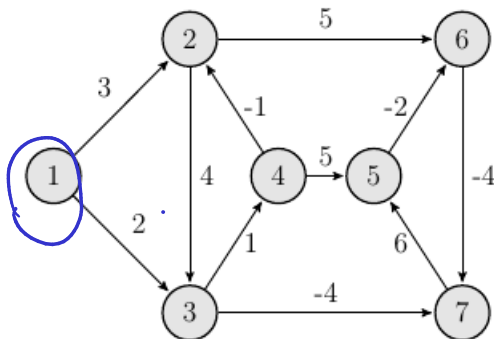
Is 3 reachable from 1?

NO



Node 1 has children 2, 3
 Node 2 has child 6, 3
 Node 3 has 4, 7
 Node 6 has 7
 Node 4 has 5
 Node 7 has 5
 Node 5 has 6

GRAPH



TREE

