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Given an undirected graph, explain how you can determine whether it is a tree or not. What would be the running time?

A tree is an undirected graph in which any two vertices are connected by exactly one path, and there is no cycles

To deteremine is the graph is a tree or not we must check some conditions

1.check for cycles :

There is a method I implemnted to check there is cycles or not and it is imbelemeted by DFS and check if the vertice Is in stack of that has the visited vertices if it is found in it it then there is cycle in the graph

Check for conectivity :

We can check it by dfs or BFs and we must visist all nodes

Check for edges number :

A tree with n vertices , it should have exactly n-1 edges

the running of DFS or BFs is O(v+E) where v is number of vertices and e is number of edges
as both DFS and BFs visit each vertix and edge onece and if the graph has more than n-1 endges you can conclude easily that is not a tree