NPTEL

NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory - 1

Introduction to Tree

By
Prof. S.R.S Iyengar
Department of Computer Science
IIT Ropar

A tree is a connected a cyclic graph, what do I mean by the cyclic? A cyclic means it has no cycles,
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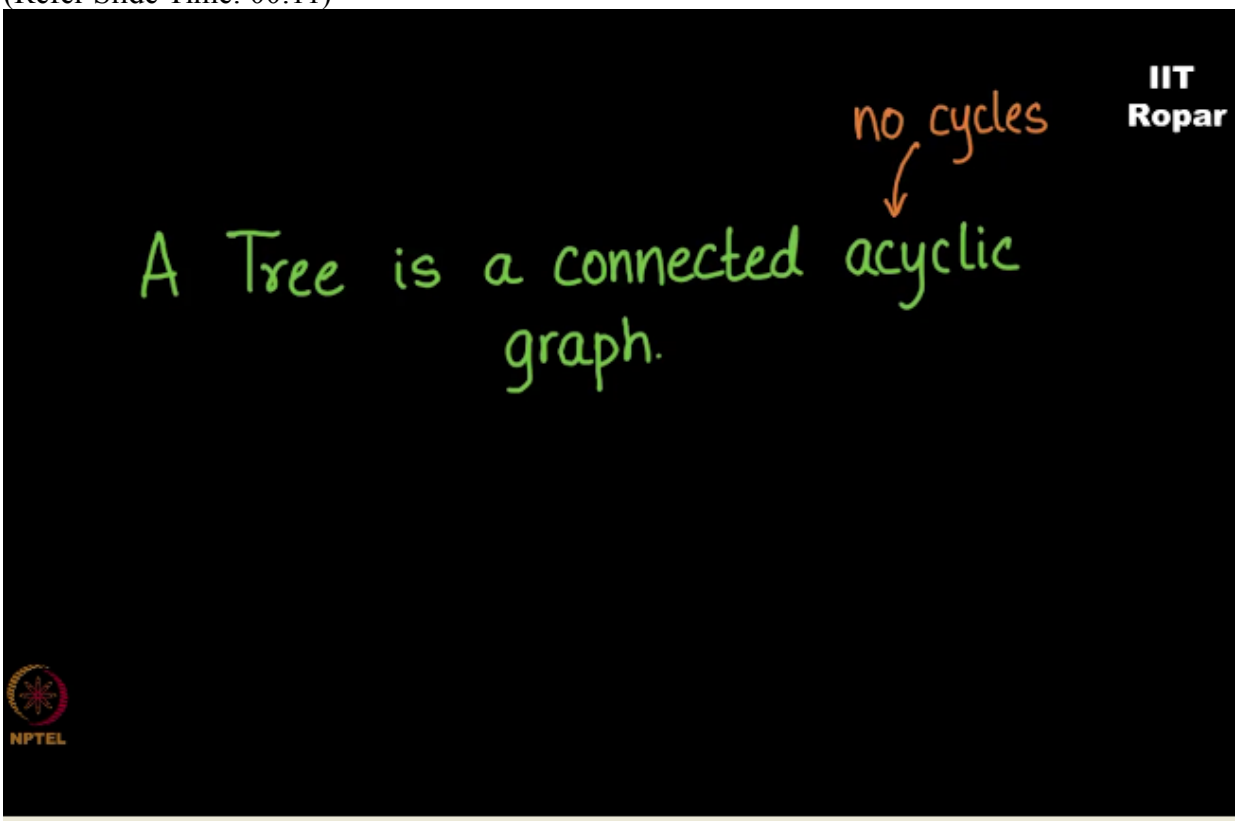

so a tree is free of cycles. The moment you find a cycle you can guarantee that it is not a tree.

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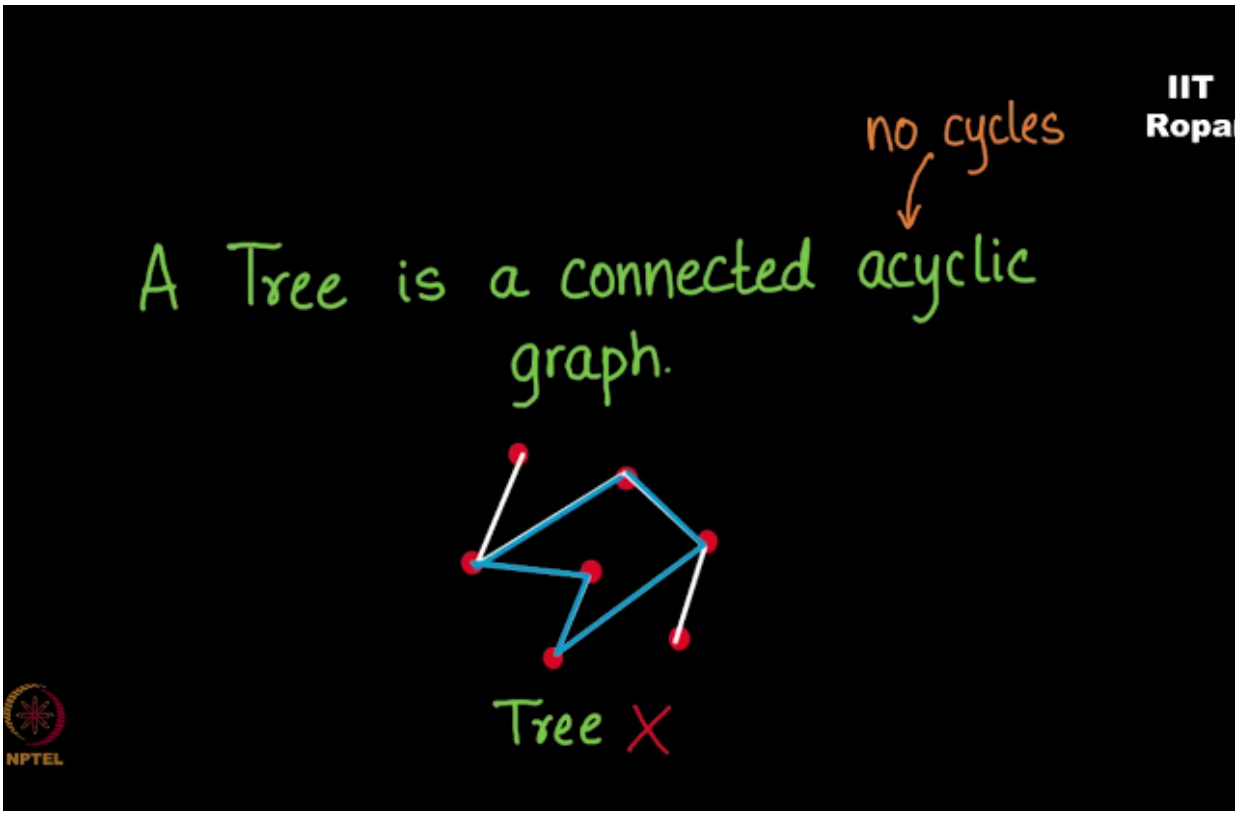

Now the special property of tree is that the number of edges in tree is always 1 less than the number of nodes in a tree,

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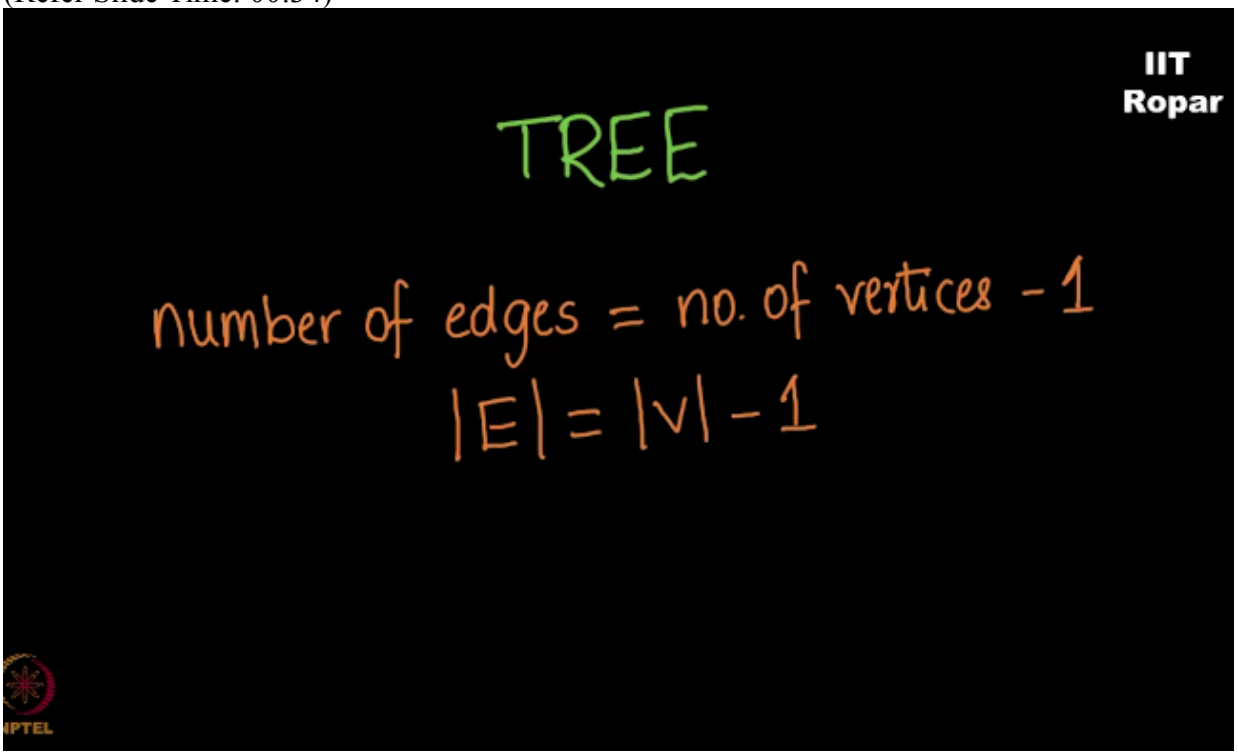

well this is a very strong concept for all new people who are computer science students because it is encountered in various other fields other than discrete math in computer science.

It is an exercise question for all of you to explore and prove using induction
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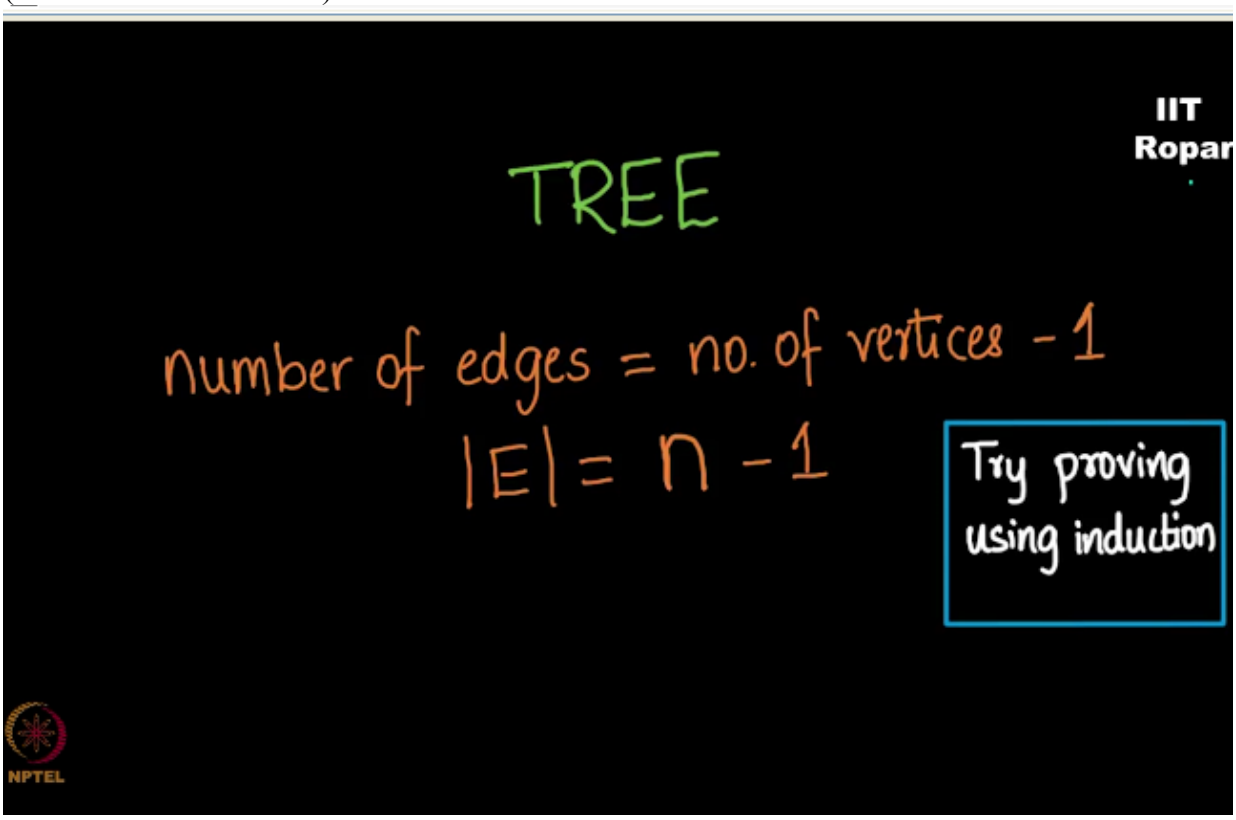

that the number of edges in a tree is N-1 where N is the number of vertices. Let me give you an example, this is an example of a tree,
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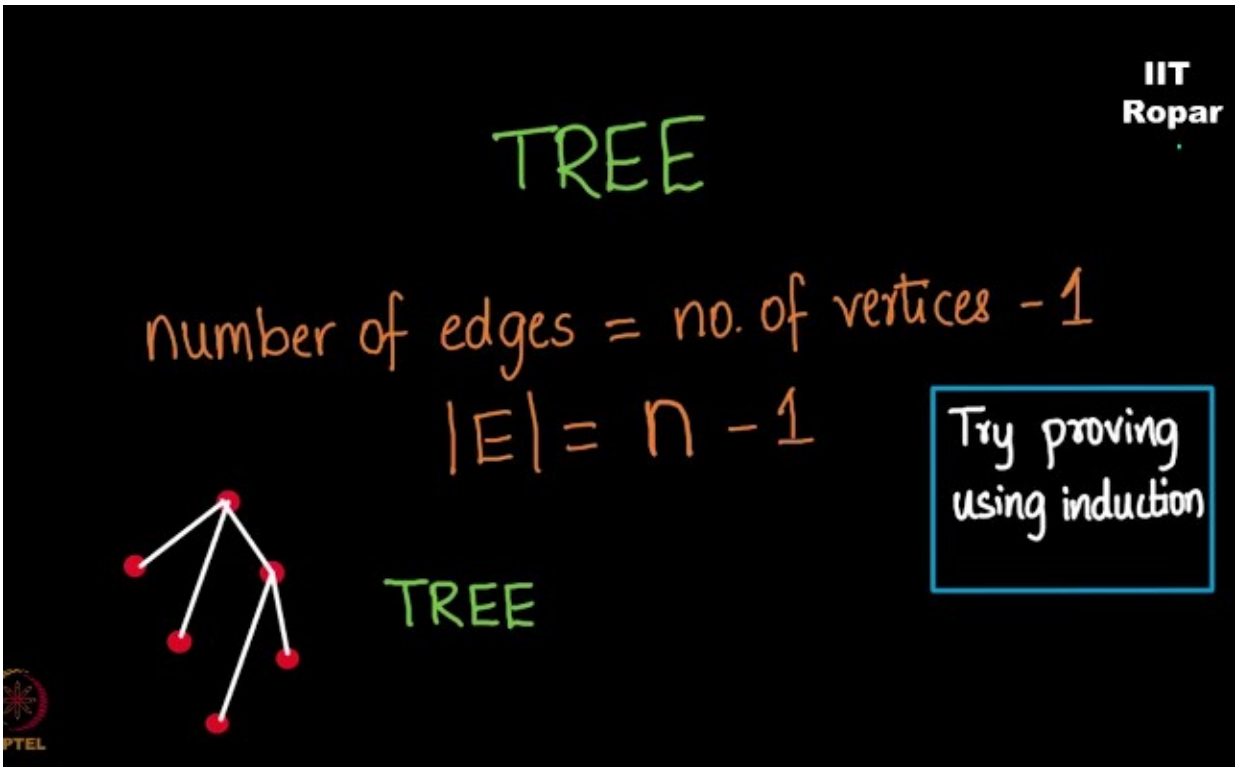

the moment a tree is disconnected that is no more called a tree, it is called as a forest.

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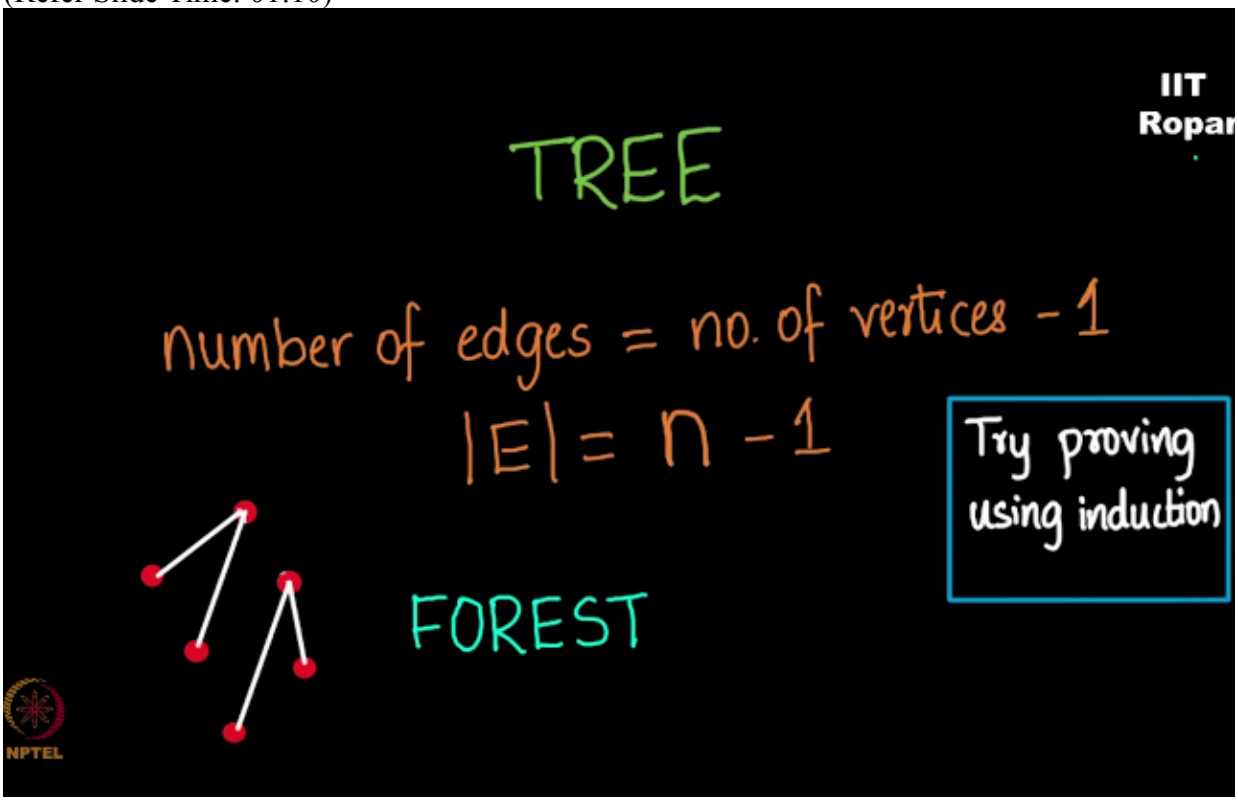

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