NPTEL

NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory – 2

Hamiltonian graph - A result
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We showed that in a complete graph one can obviously find a Hamilton cycle, a cycle that goes through all the vertices,
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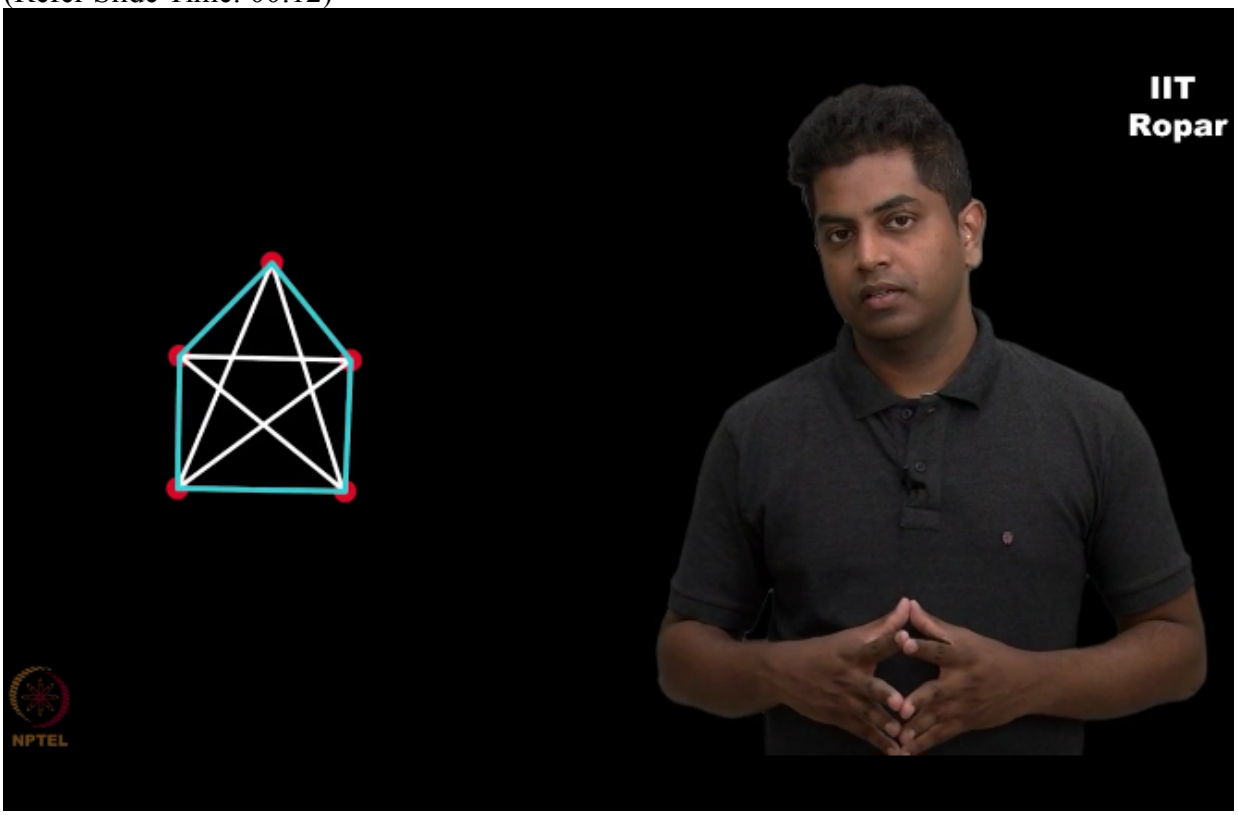

but then is it possible for any graph G,
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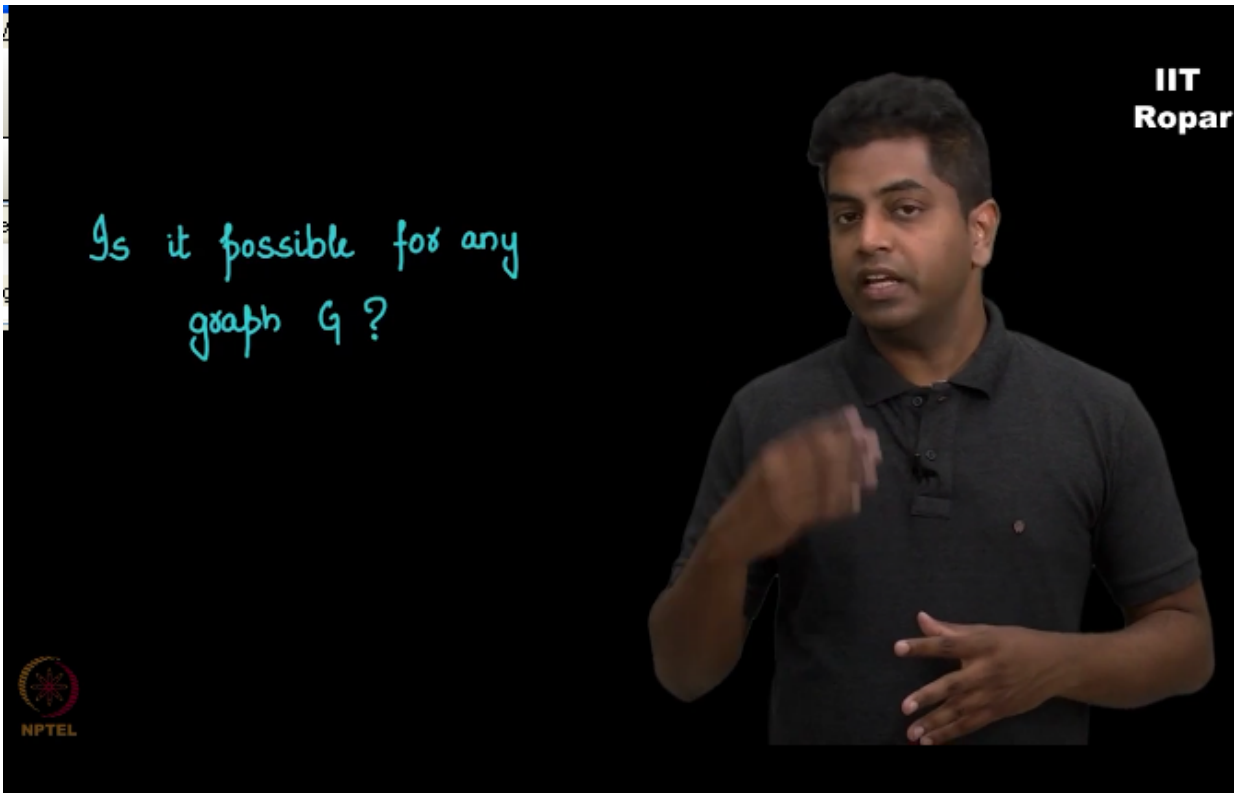

first of all there may not be Hamilton cycle, if there is one how do you find one? Now that's the question,

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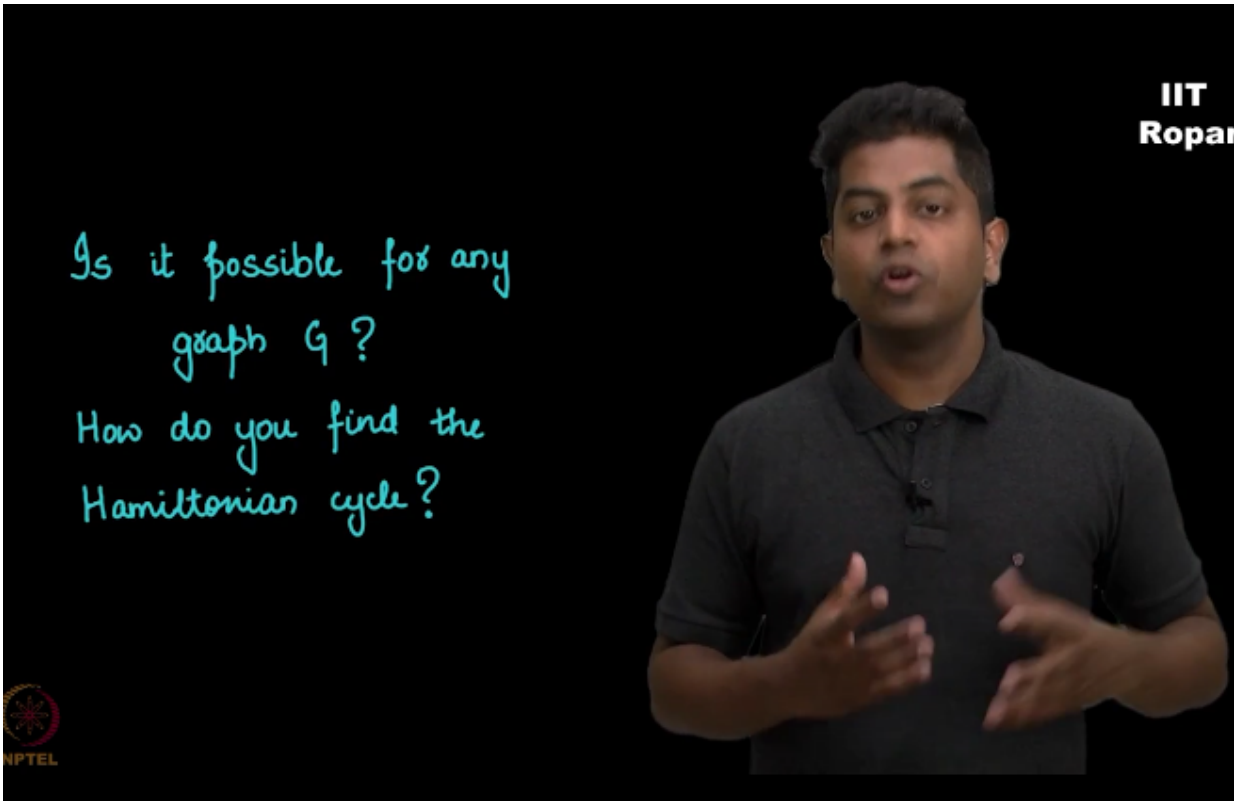

there is no Litmus test as I told you it is known at least, but do you sense something here? If there were a lot of edges maybe it feels, a gut feeling, it feels there could be a cycle going through all the vertices, and hence for me a Hamilton cycle,
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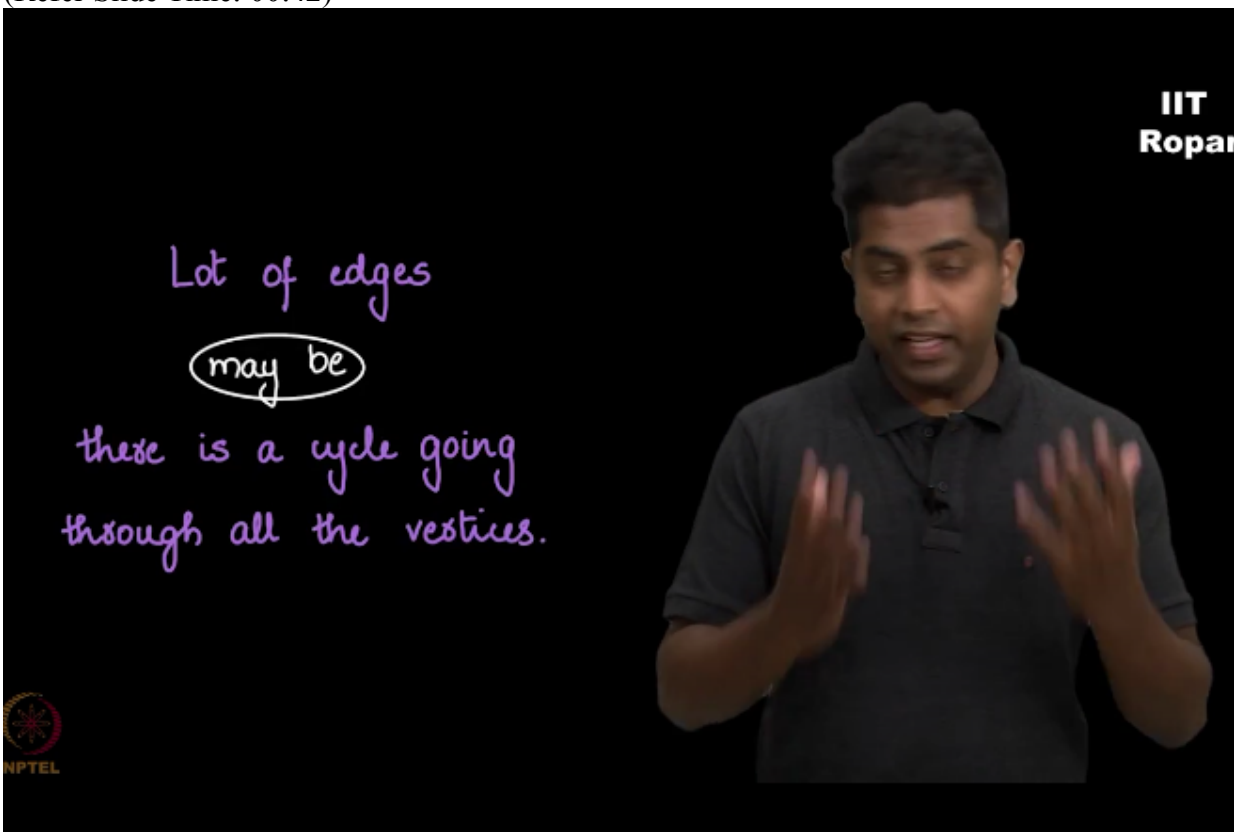

the feeling indeed is true, and there is one cute result in this regard, result goes like this, if you can guarantee to me that given a graph G, every single vertex has degree greater than n/2, which is it is, it has edges with half the nodes, then it should be true for every single node then the graph has a Hamilton cycle.
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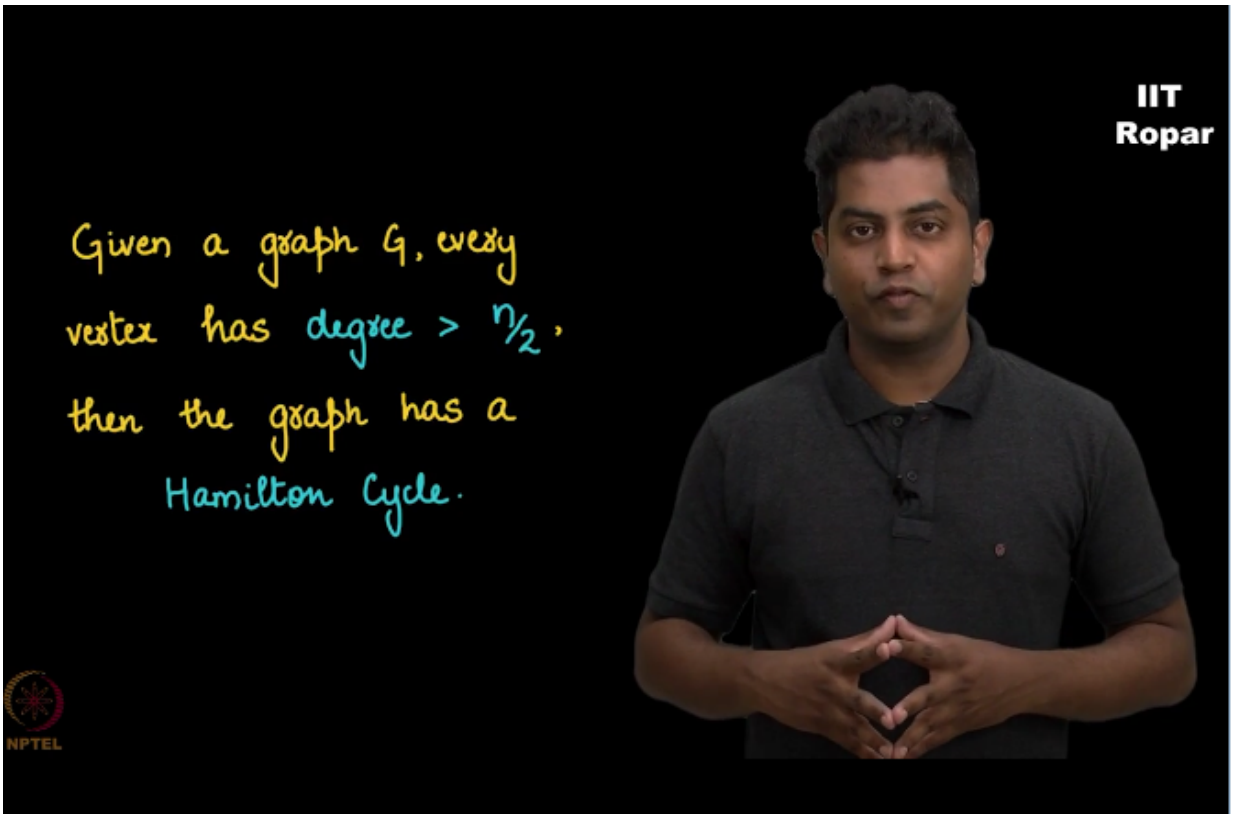

Let us see the proof of this.