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NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory - 2

Importance of Hamiltonian graphs in
Computer science

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You see the case of Eulerian was so easy, the question there was go through all the edges, the case of Hamiltonian was simply the same question with edges replaced by vertices, go through all the vertices. You see there it was so easy, it was simply all of them should have even degree, but here we have no clue what is the answer, there is no easy way to find out whether a given graph is Hamiltonian or not, although we saw a few results which said if this is true then it is Hamiltonian, there is no clear cut way to say whether a given graph is Hamiltonian or not in all possible cases.

So this problem is not just interesting, in the mathematical version that we gave you, it is also very interesting for computer scientist in the sense that it's a very strange class of problem where most of the computer science problems can be converted to this problem, it's a little hard to understand, can be converted means every single problem can be transform to appear like a Hamilton cycle problem, given a graph is there a Hamilton cycle or not, you ask me any question I can convert this question to this question, not all but most of the computer science problems fall under this category, and this is called, we term it as hard as the Hamilton problem.

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