**NPTEL**

**NPTEL ONLINE CERTIFICATION COURSE**

**Discrete Mathematics**
**Graph Theory - 2**

**Dirac's theorem - A note**

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The theorem which the professor proved now is called the Dirac's theorem, it provides a sufficient condition for a graph G on N vertices to be Hamiltonian,
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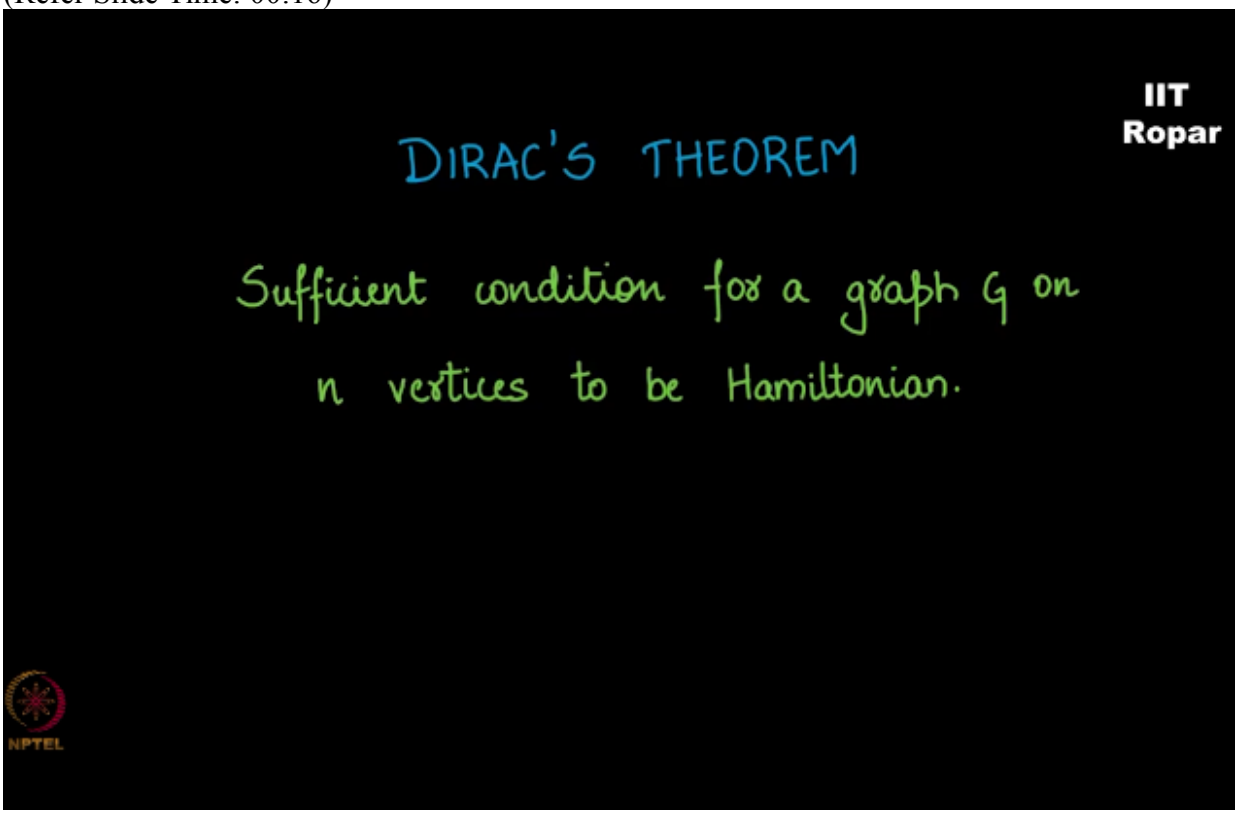


it's just sufficient, but it is not necessary for Hamiltonian graph to satisfy the condition that degree of every vertex greater than or equal to n/2 for every vertex,
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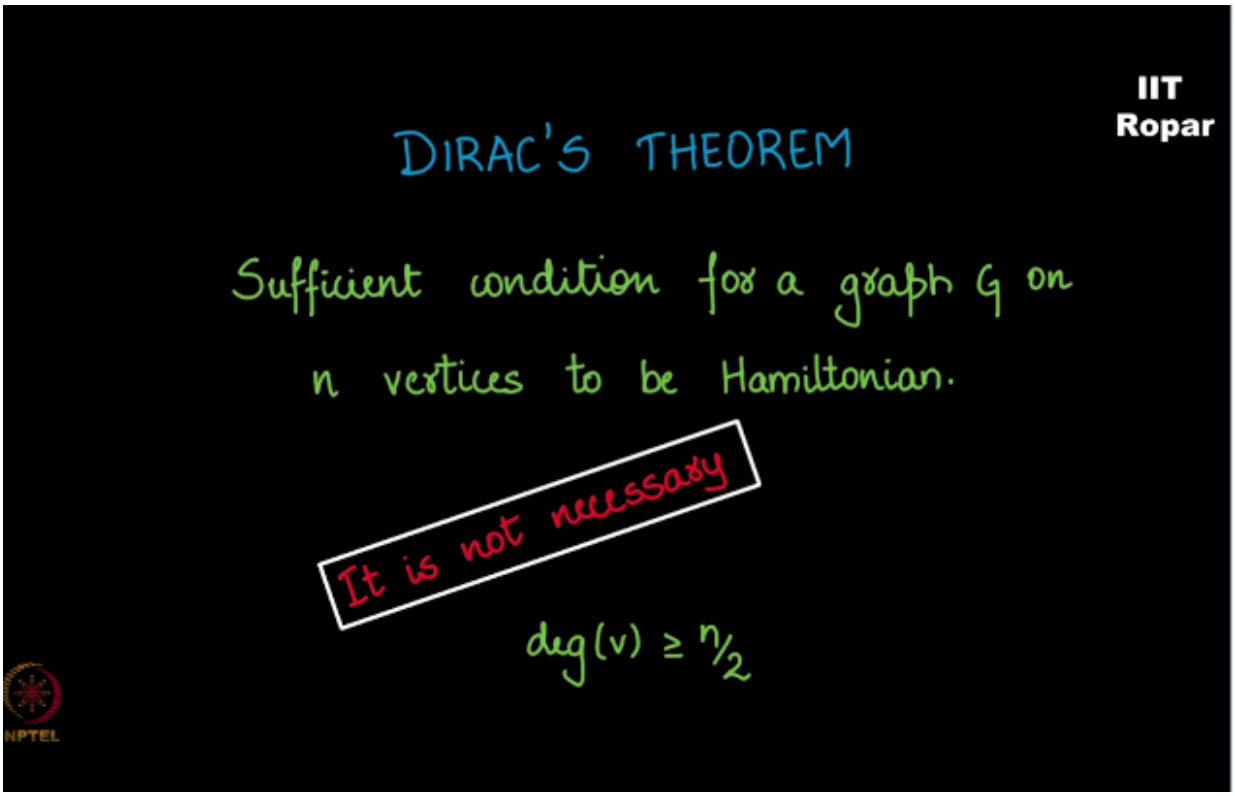


it's not necessary for this condition to be true, even without this condition sometimes the graph maybe Hamiltonian.

Now an example for this situation will be any cycle CN, you see let me take an example C6, degree of every vertex is 2 here, and n/2 is 3, and 2 is less than 3,
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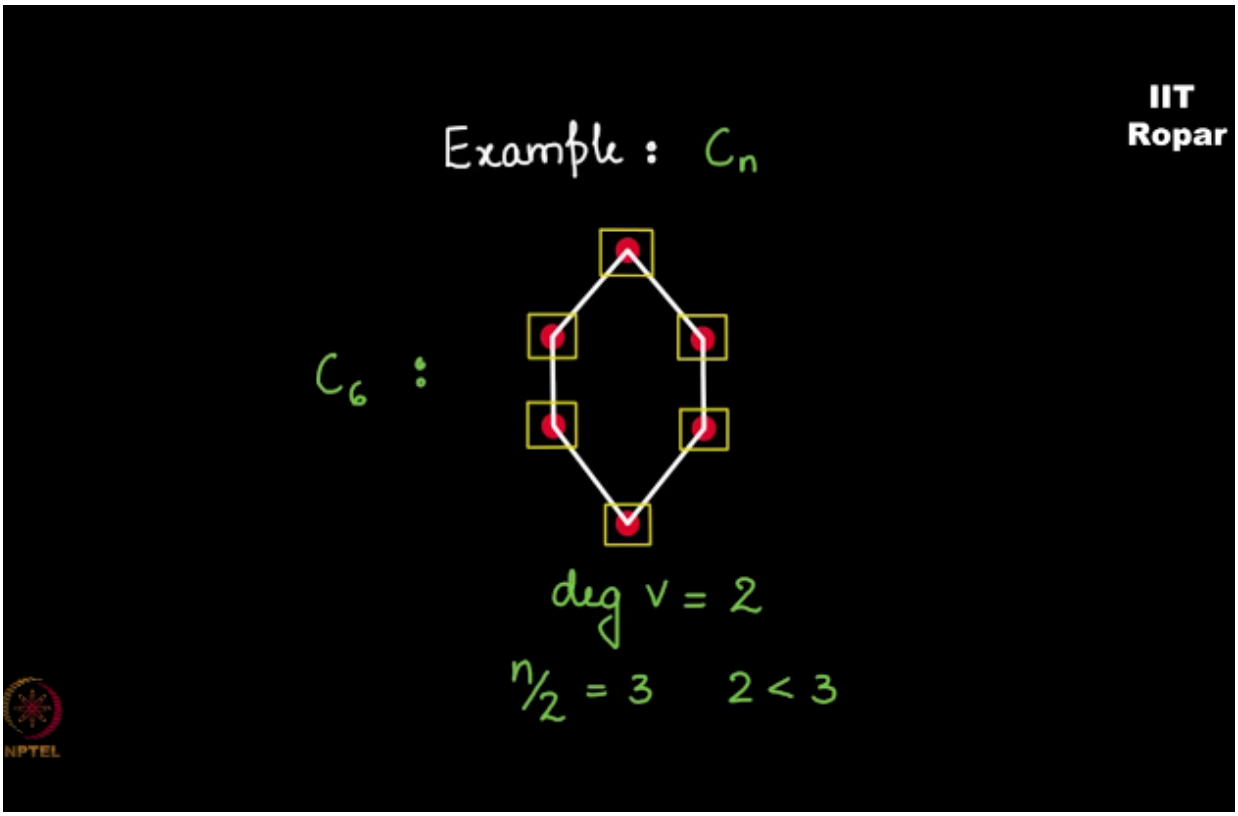


but still the graph is Hamiltonian, so as a counter example we can take all CN,

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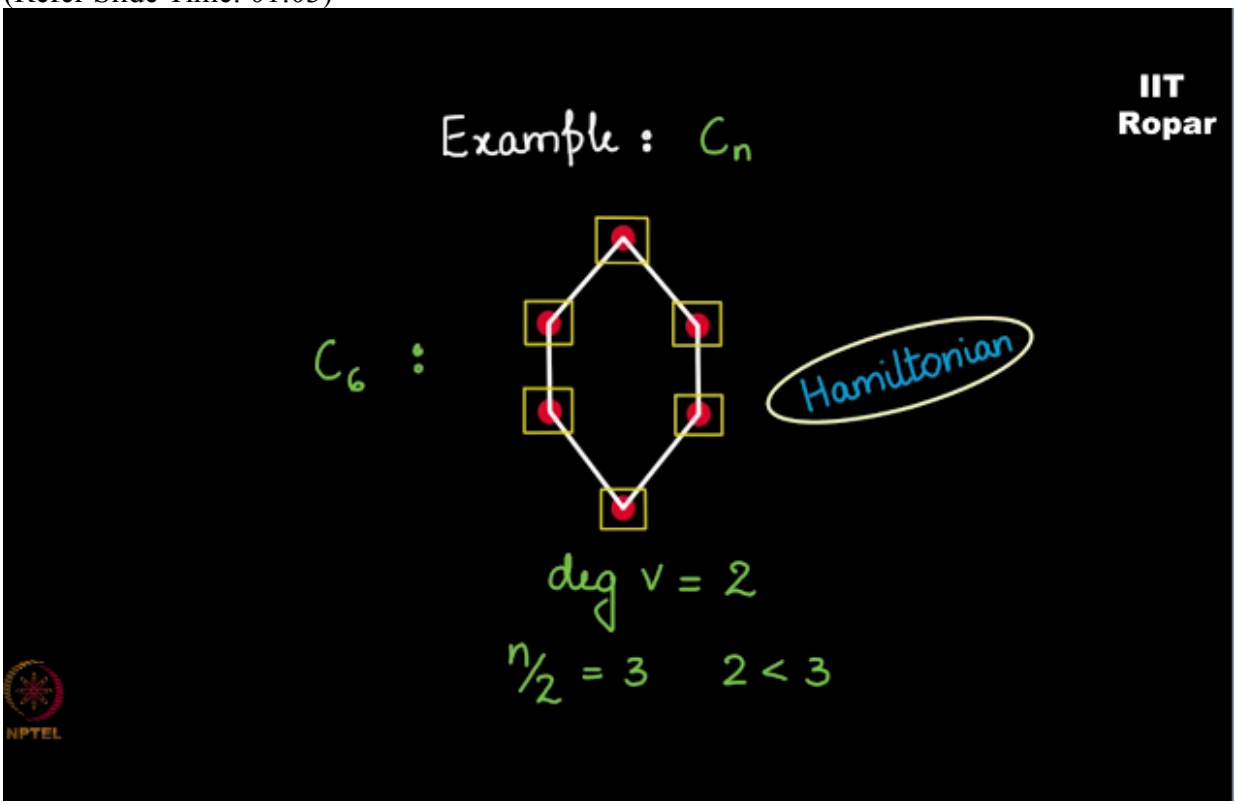


so it just gives a sufficient condition but it is not necessary.

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