NPTEL

NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory - 1

Problems based on Hand shaking lemma

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Let me just clarify whatever we have seen in the previous video by taking some example, consider this graph on 6 vertices, let me write it down, 1, 2, 3, 4, 5, 6,
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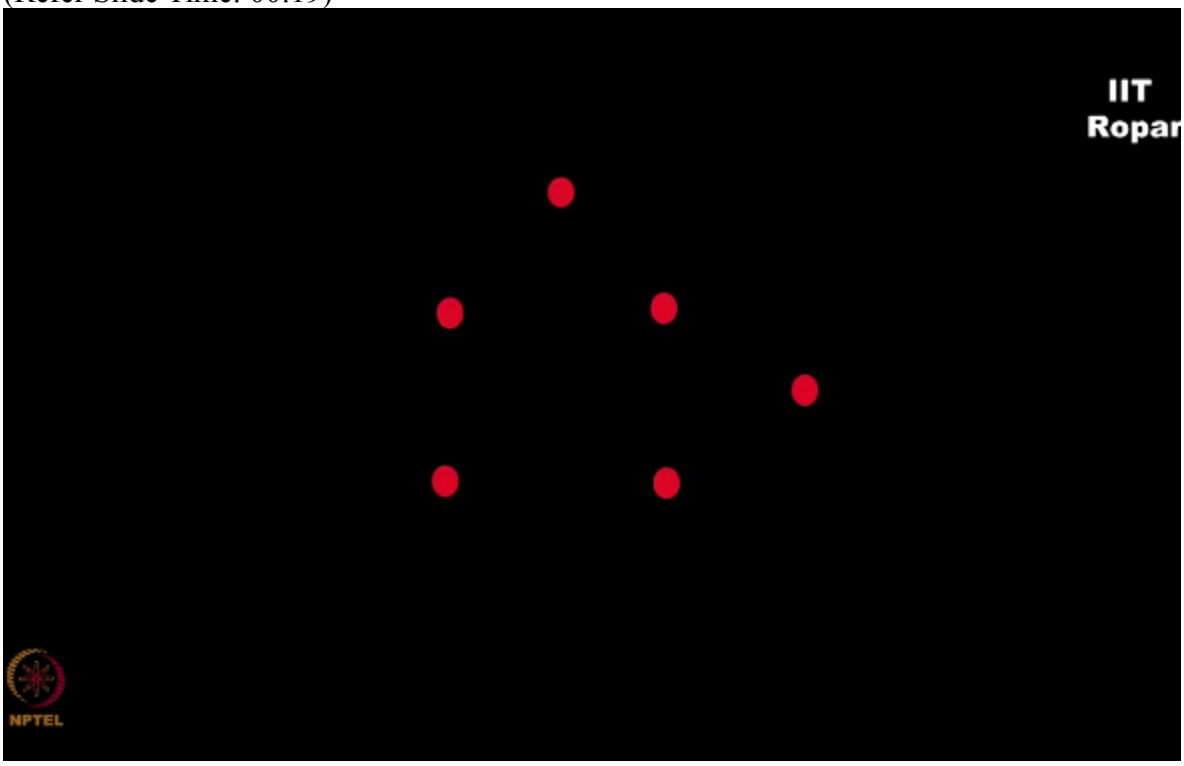

so 6 vertices and let me put some random edges,
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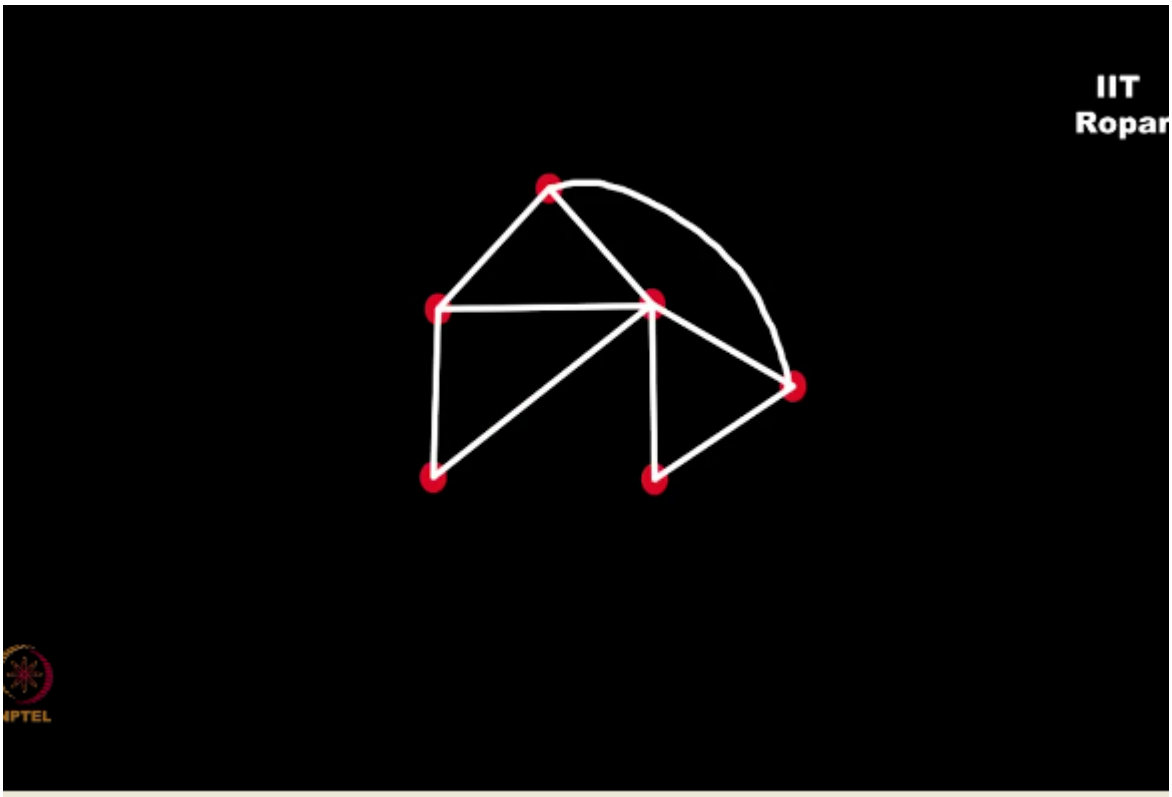

I'm not going to count how many edges have put, so let me do it this way, yeah, so these are my edges.

Now let us count the degree of every vertex here, it is 3, 3, 2, 2, 3 and 5
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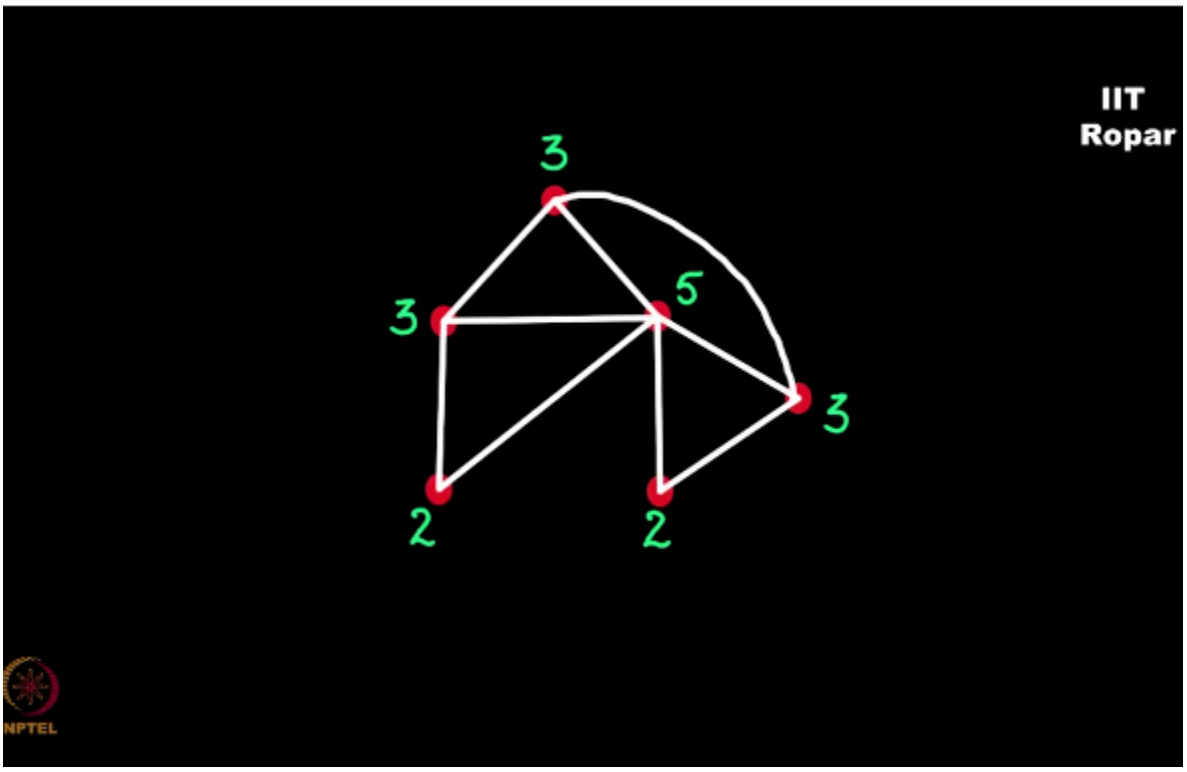

perfect, so do you observe something? What did we see? We saw with the previous result that every graph has an even number of odd degree vertices, so how many odd degree vertices, we have 1, 2, 3, 4

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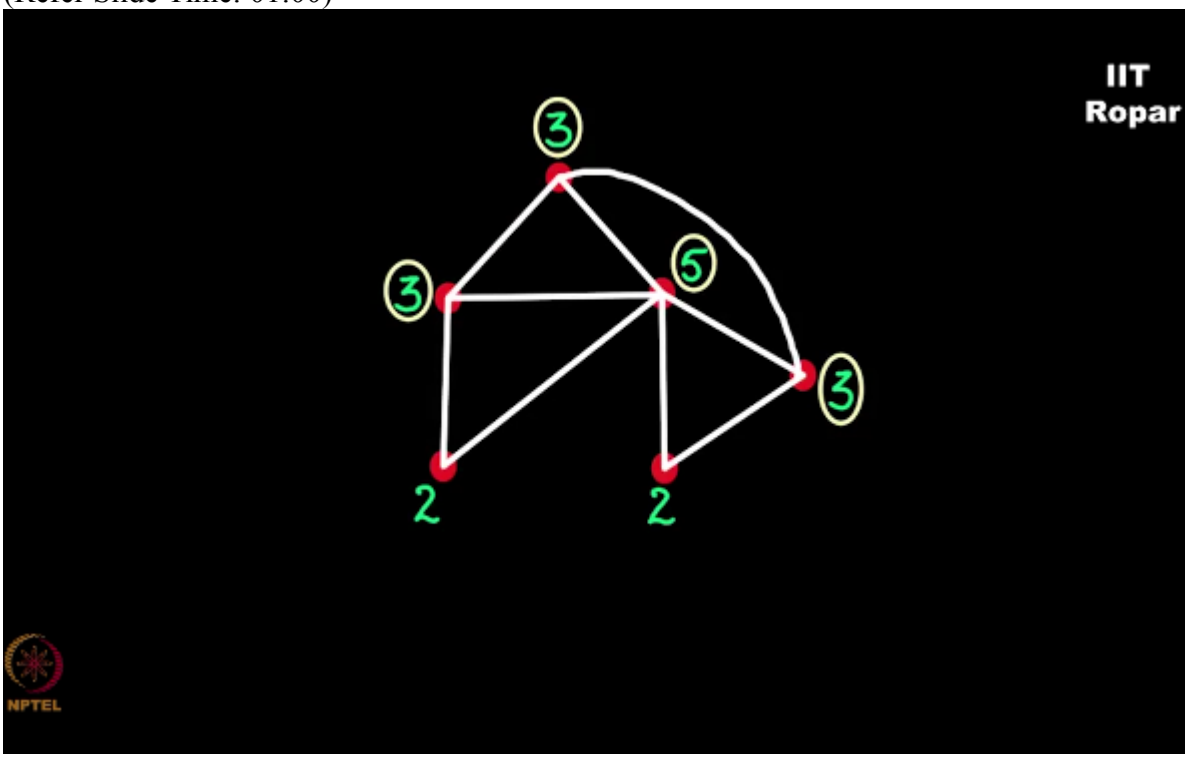

so did you see, we have 4 vertices with odd degree.

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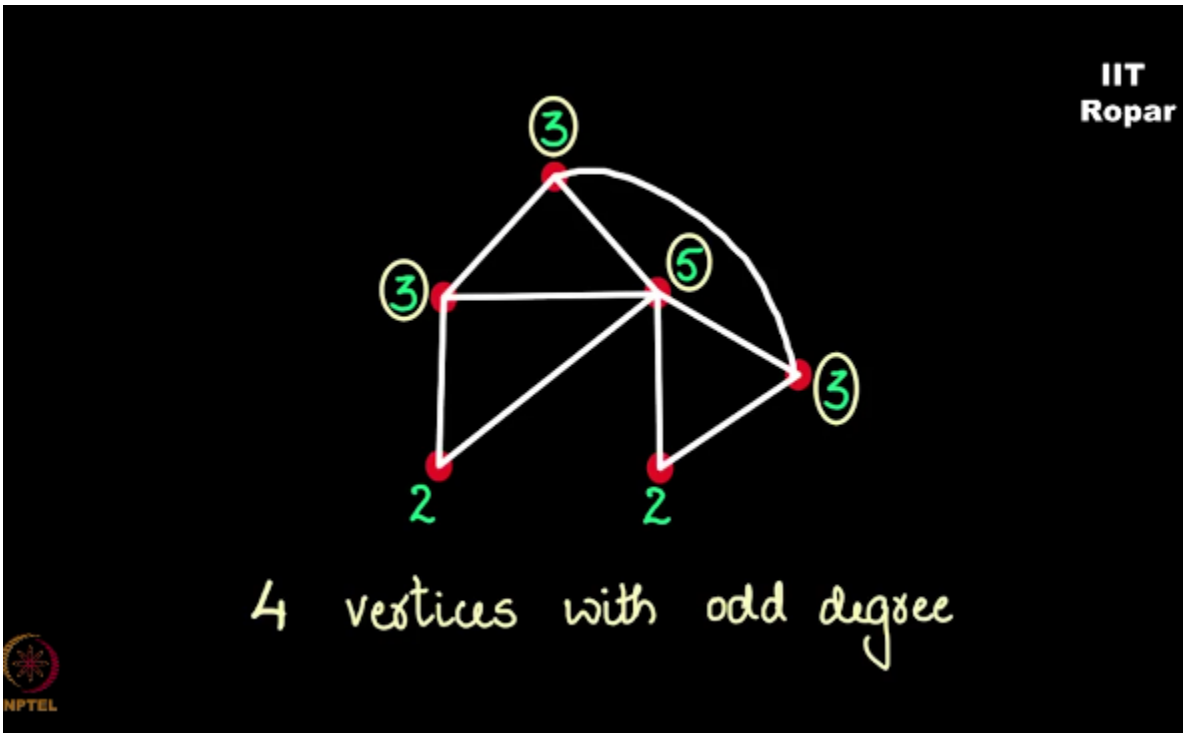

Now observe this graph on 7 vertices, I've put some random edges here
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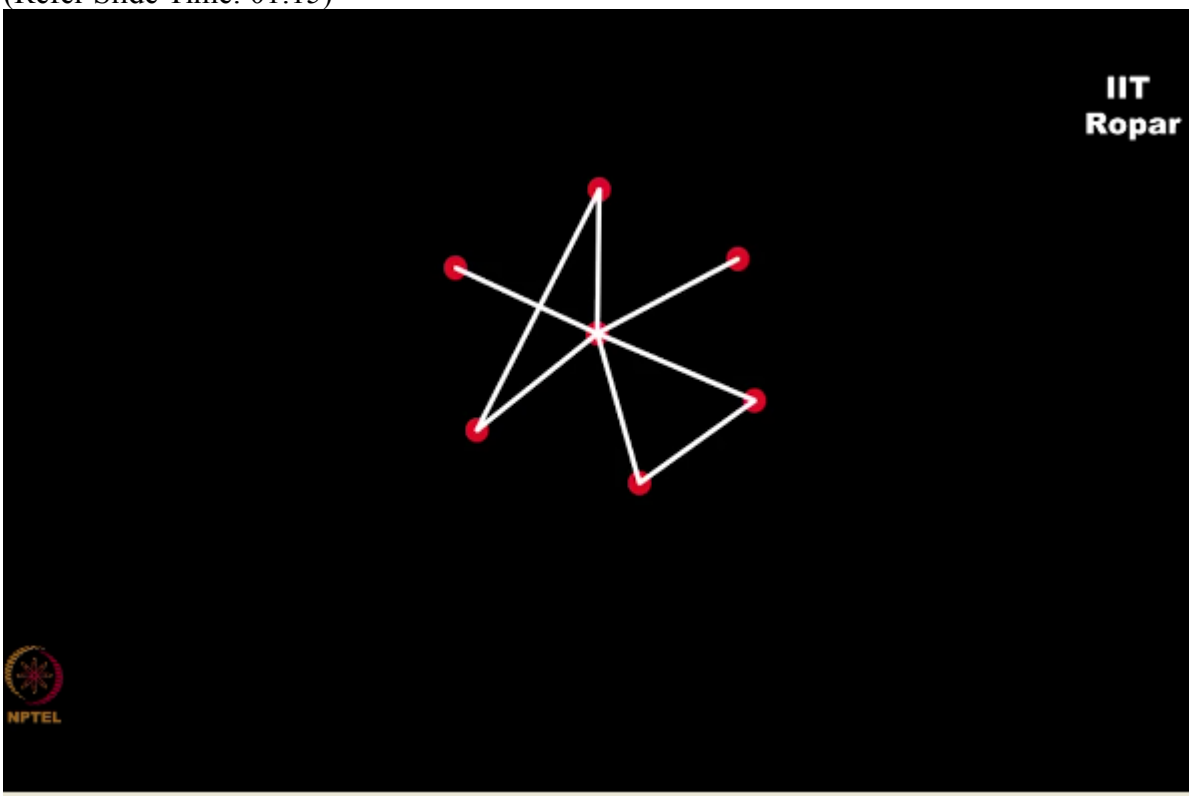

so let us again write down our degrees for every vertex, 1, 2, 2, 2, 1, 2, and this is 6

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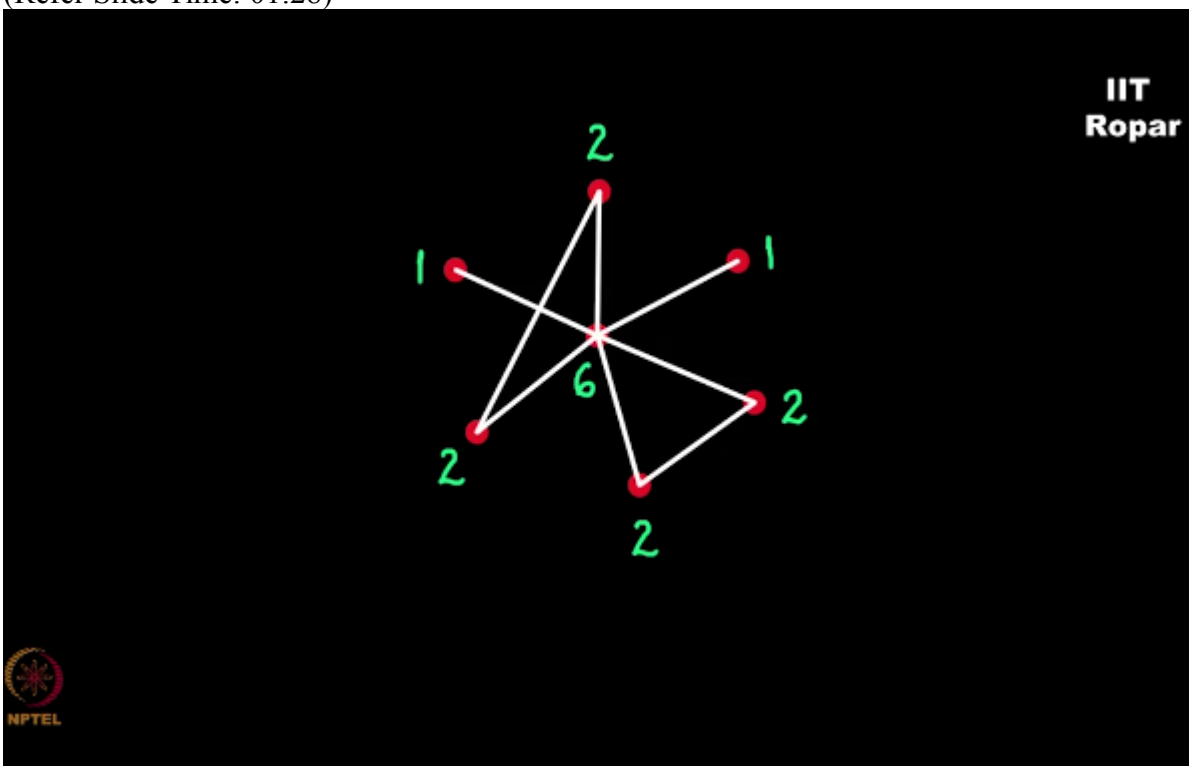

well, so the odd degrees here are just 1 here,

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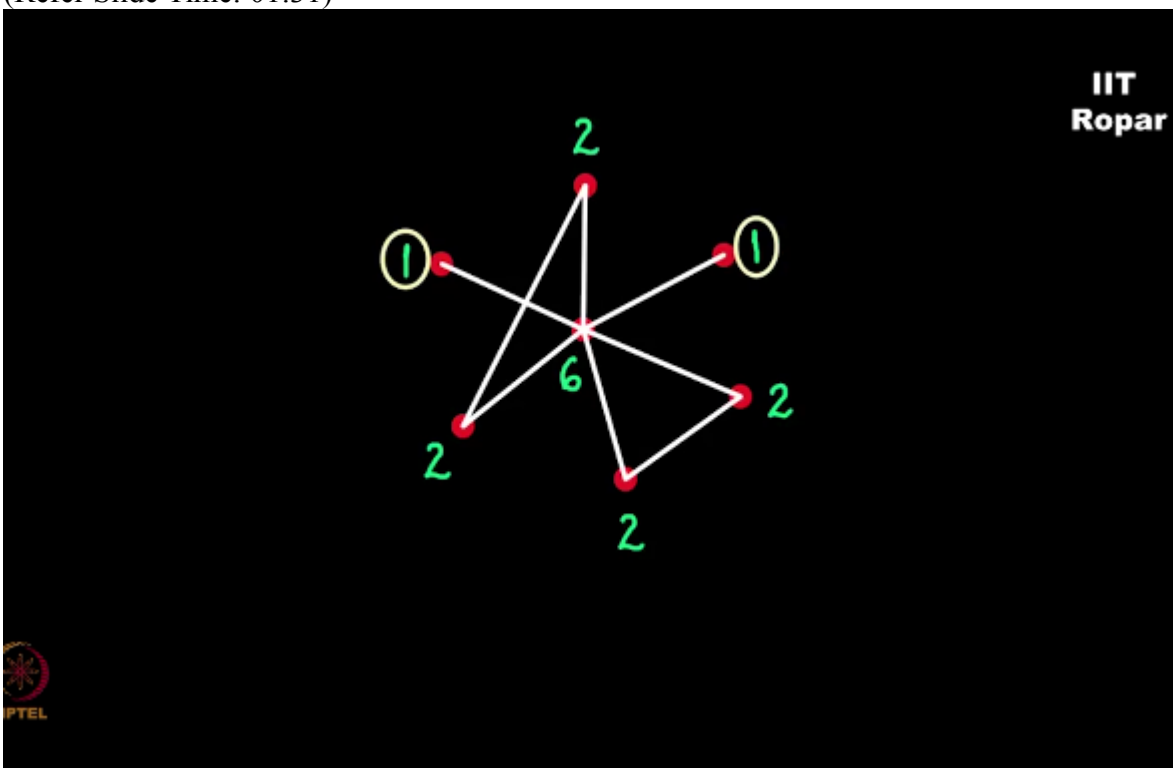

there are no other odd degrees, and how many such vertices we have? We had 2 vertices with degree 1.

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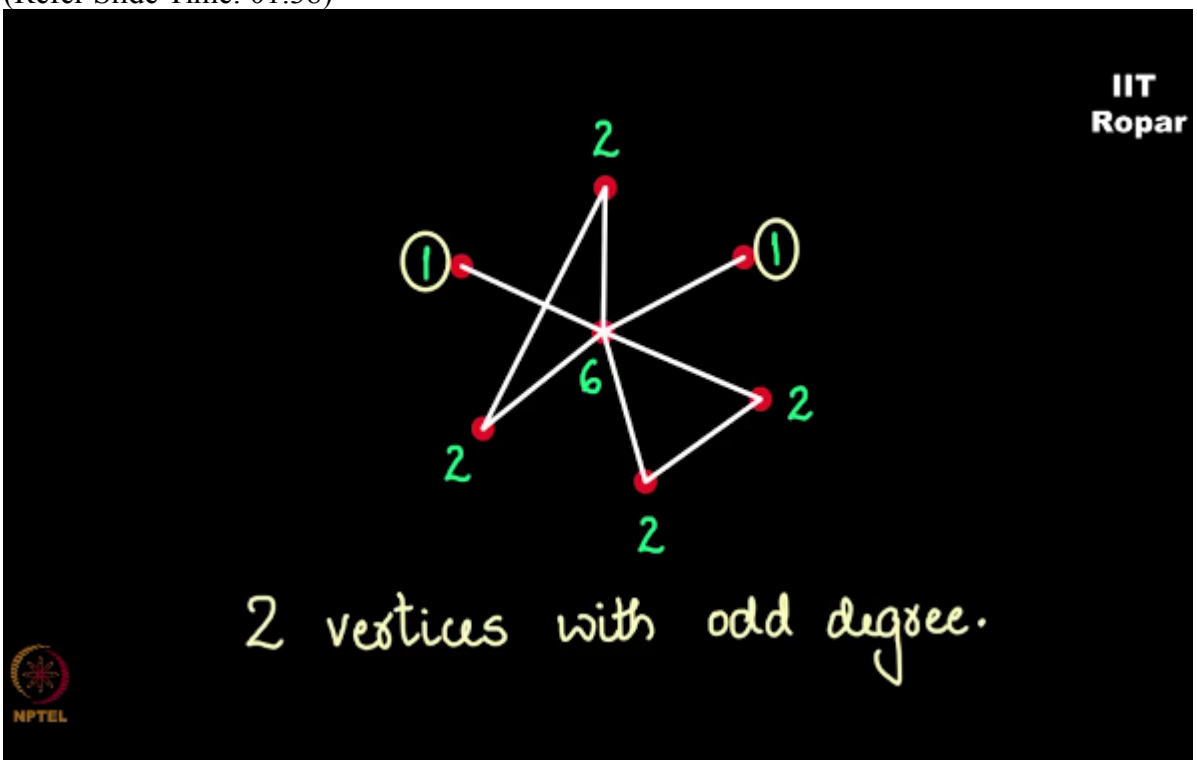

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