NPTEL

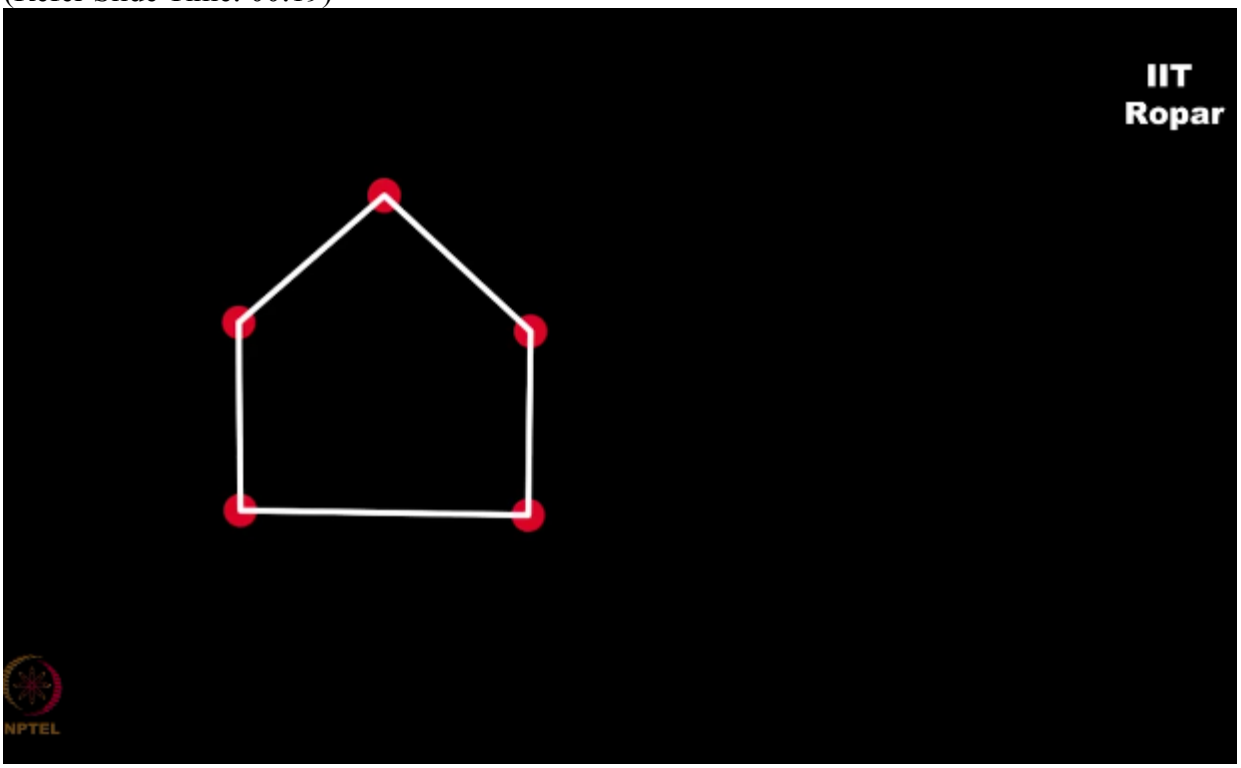
NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory - 2

Isomorphism - A question

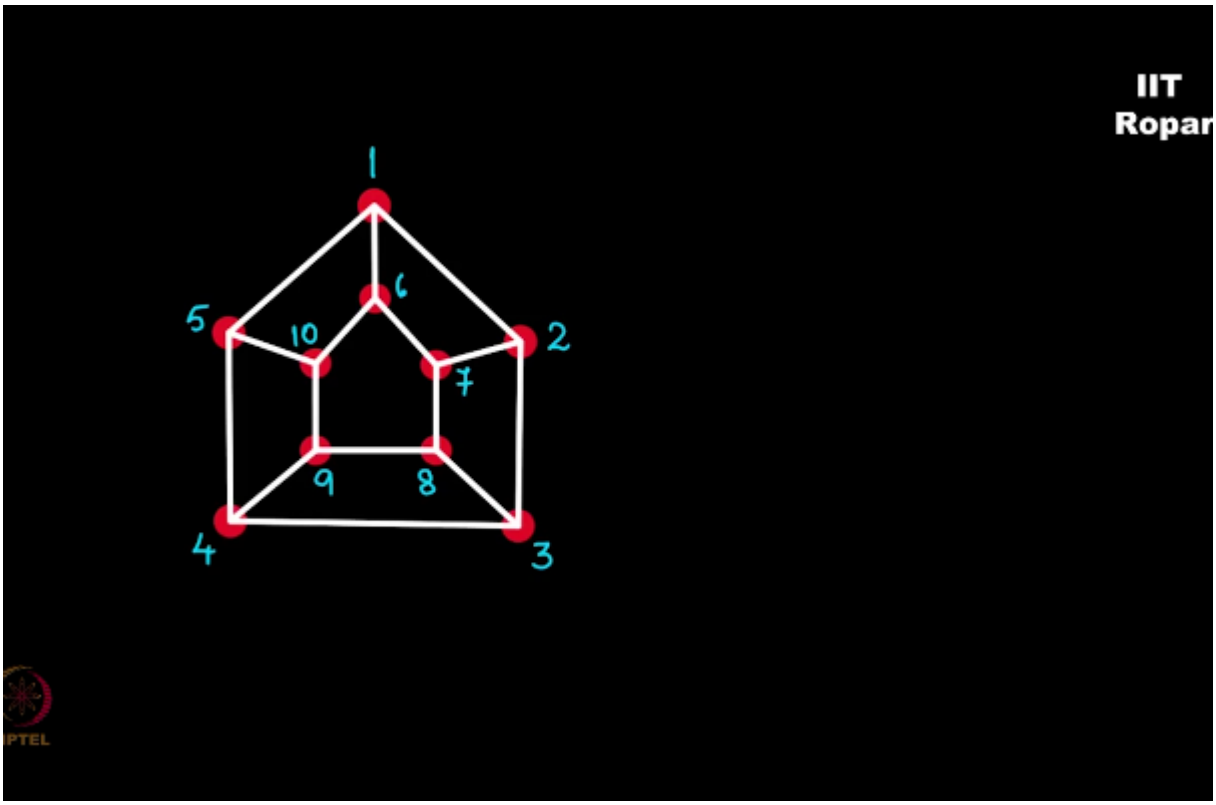
By
Prof. S.R.S Iyengar
Department of Computer Science
IT Ropar

Let us now take a very, very non trivial example, this is a sure bouncer, look at this, here is a 5 cycle, 5 cycle is simply 5 nodes
(Refer Slide Time: 00:19)



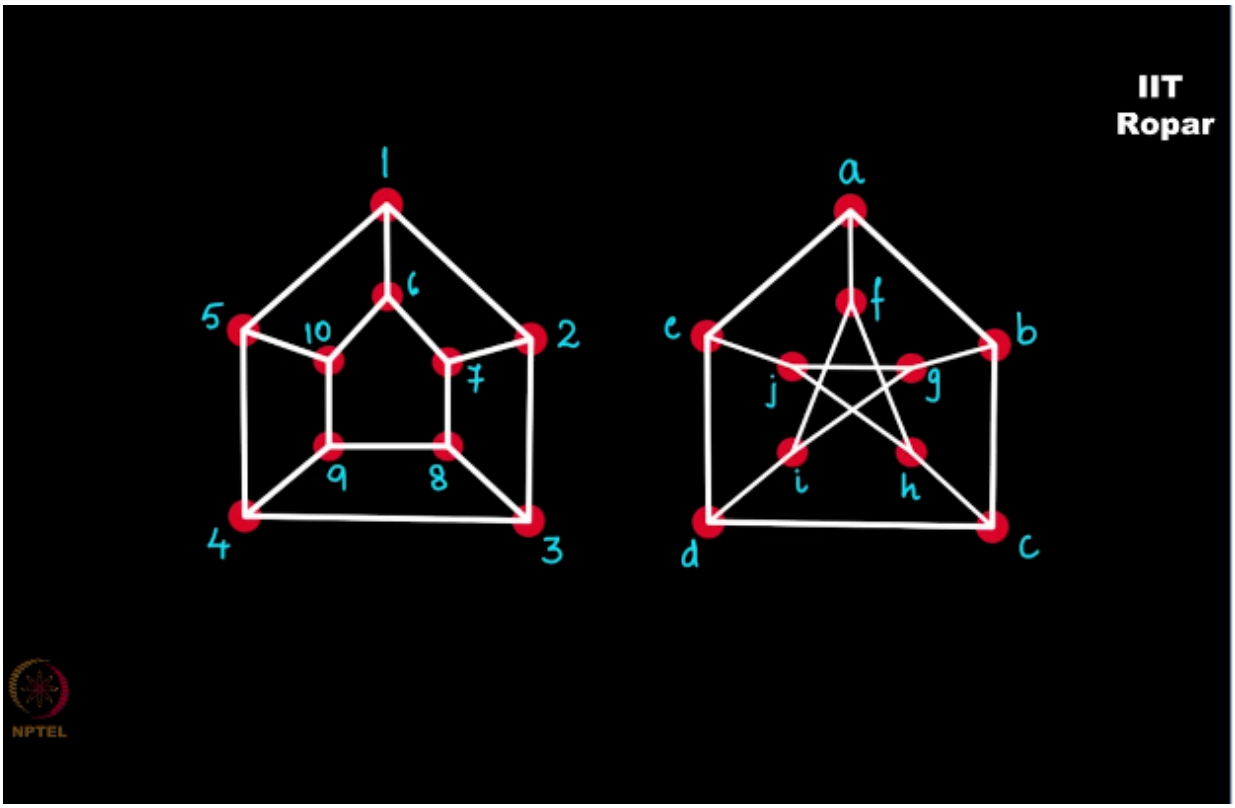
connected in the form of a cycle.

Let me write another 5 cycle inside and connect the corresponding vertices, let me call them vertex 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10,
(Refer Slide Time: 00:38)



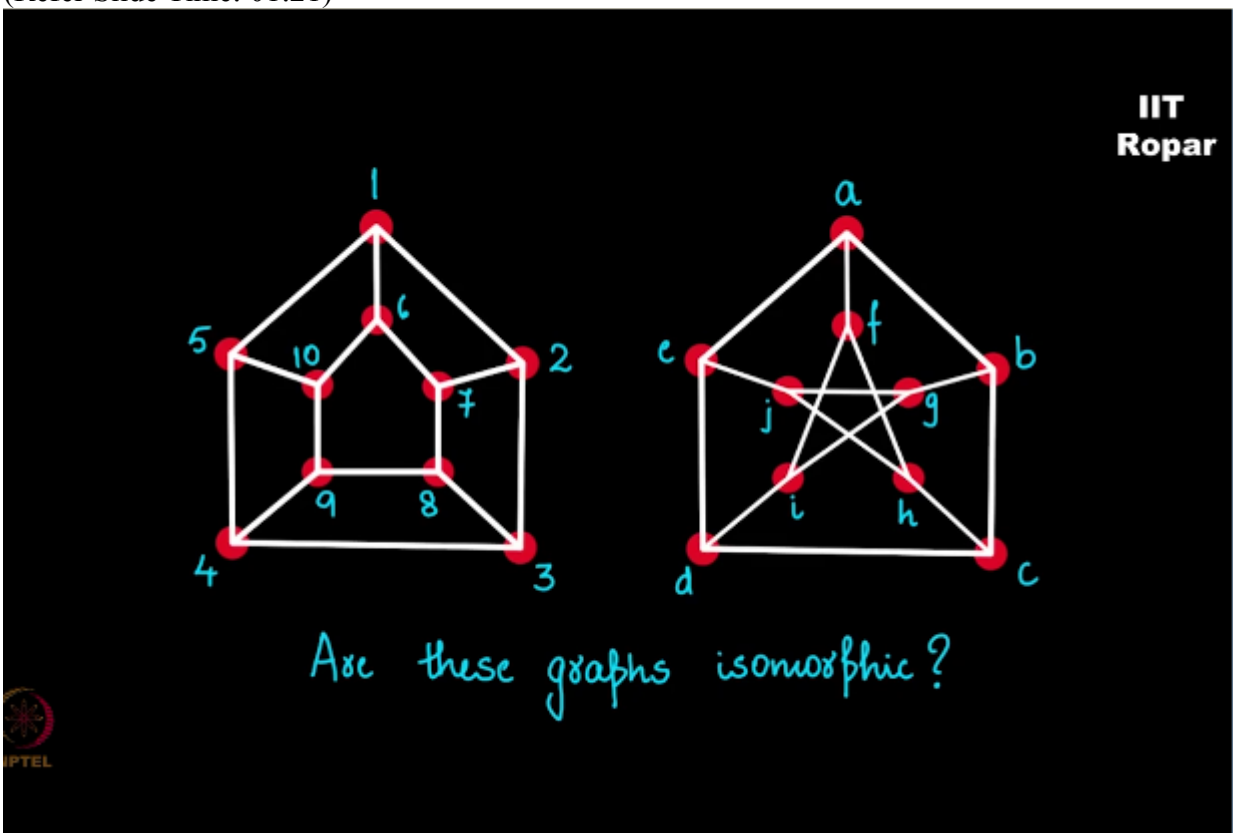
you all know that a 5 cycle can also be written as a star like this, right, 1, 2, 3, 4, 5 nodes, now what I'll do is I will write a 5 cycle, what is inside this 5 cycle? Another 5 cycle which is a star, and then connect the corresponding vertices like this, whatever this means to you, then I'm going to call them A, B, C, D, E, F, G, H, I and J,

(Refer Slide Time: 01:13)



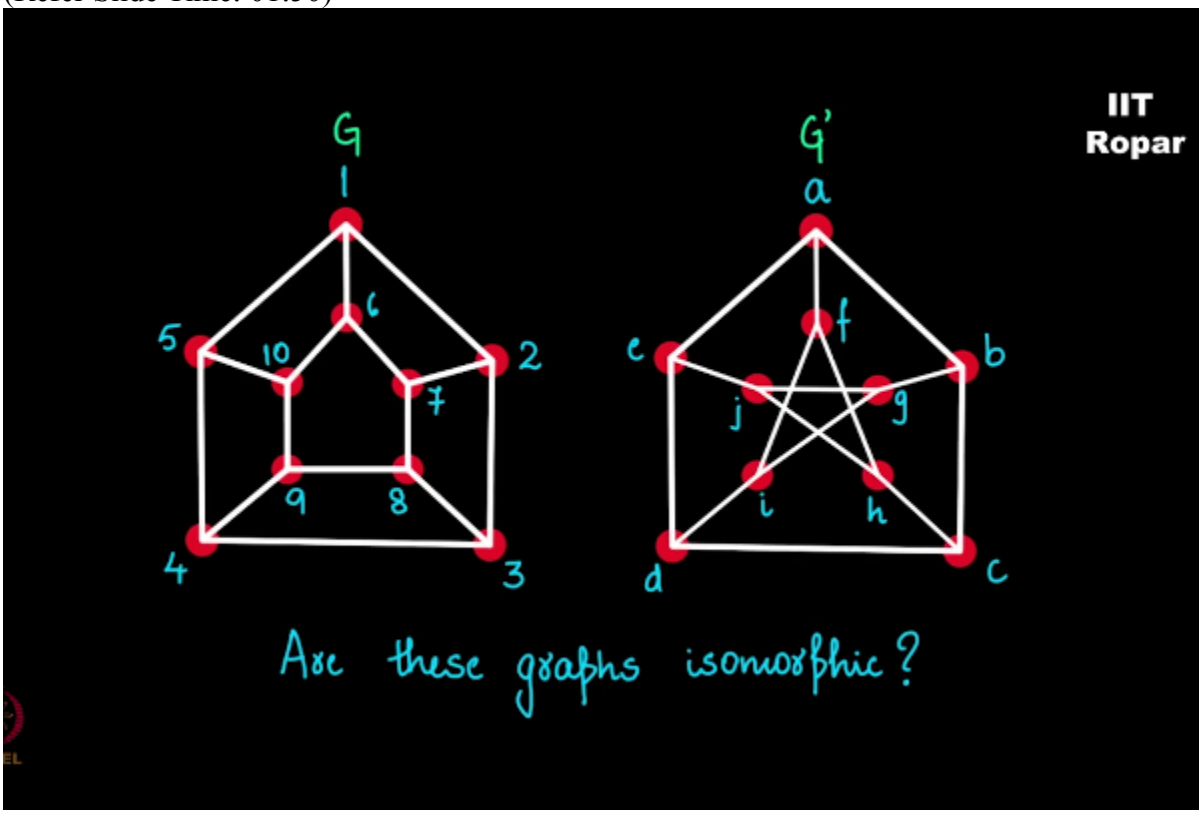
all of you I'm sure have guessed to the question right now, are these two graphs isomorphic?

(Refer Slide Time: 01:21)



Sounds easy a question to ask but this is a right time for you to pause the video and work this out for at least spending the next 15 minutes and figure out is there an isomorphism from the graph G to the graph G dash, you see the vertices are the same, edges are the same, degree sequence is the same, in fact the inner graph, the inner 5 cycle I have written it differently and then connected them.

(Refer Slide Time: 01:50)



Are these two isomorphic? Think about it.

IIT MADRAS PRODUCTION

Founded by
Department of Higher Education
Ministry of Human Resources Development
Government of India

www.nptel.iitm.ac.in