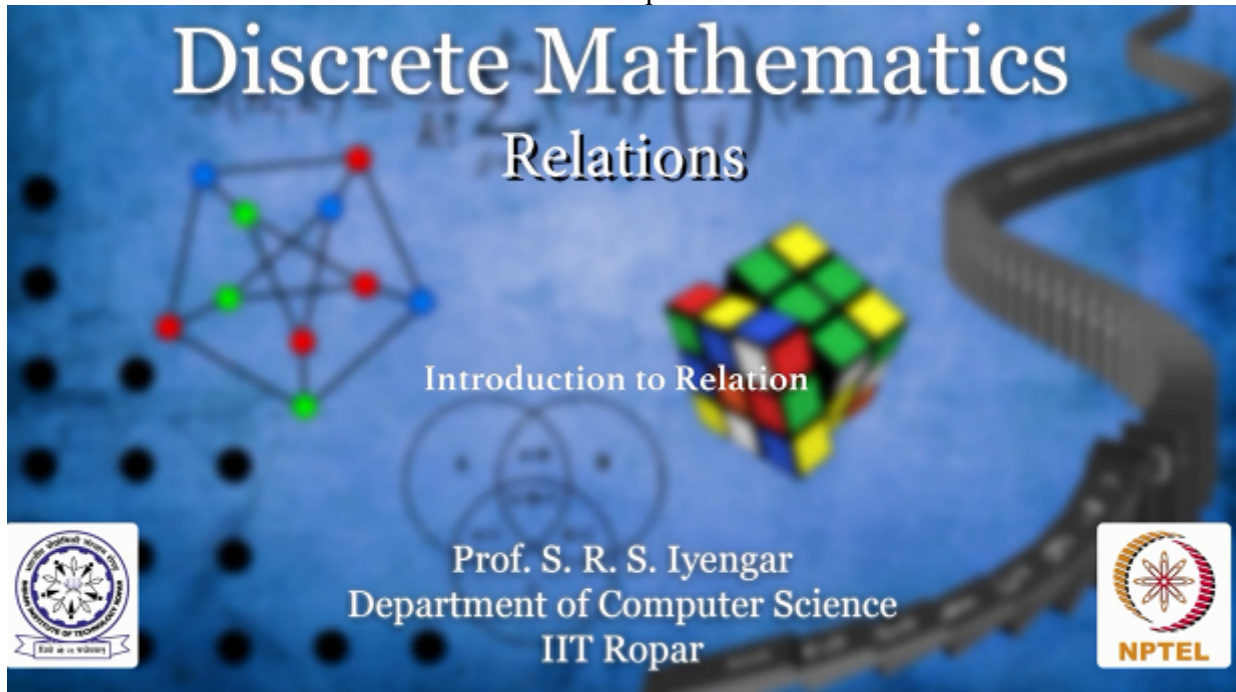
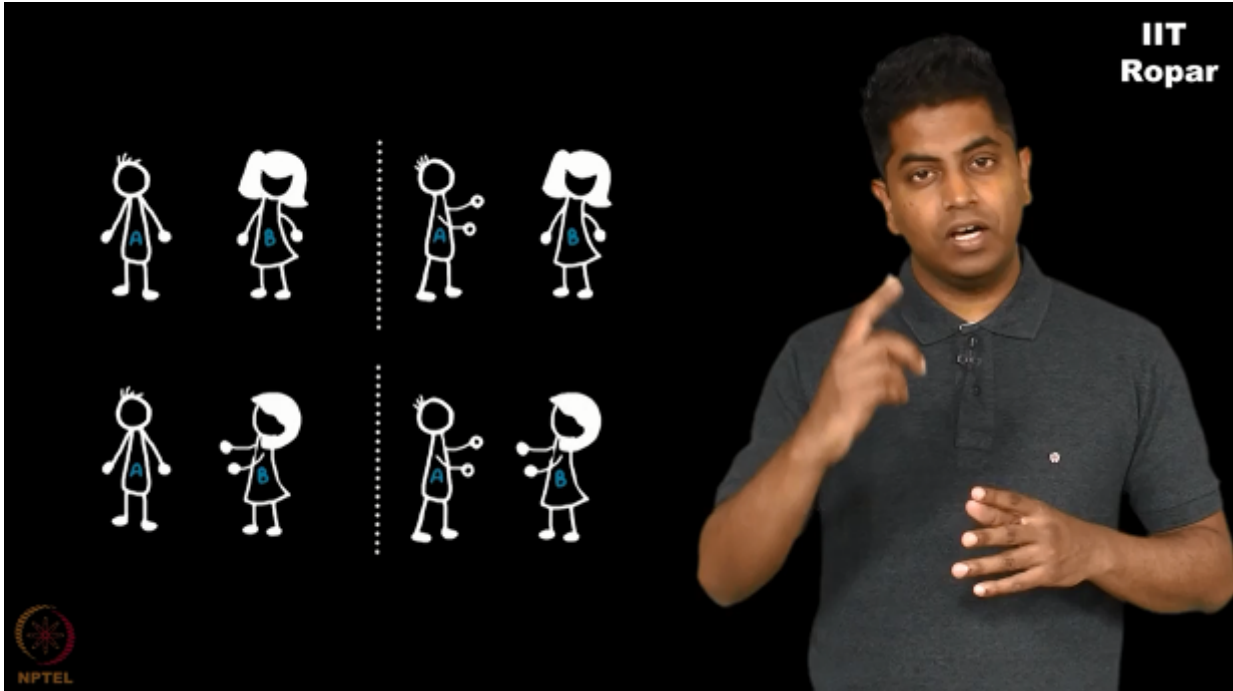


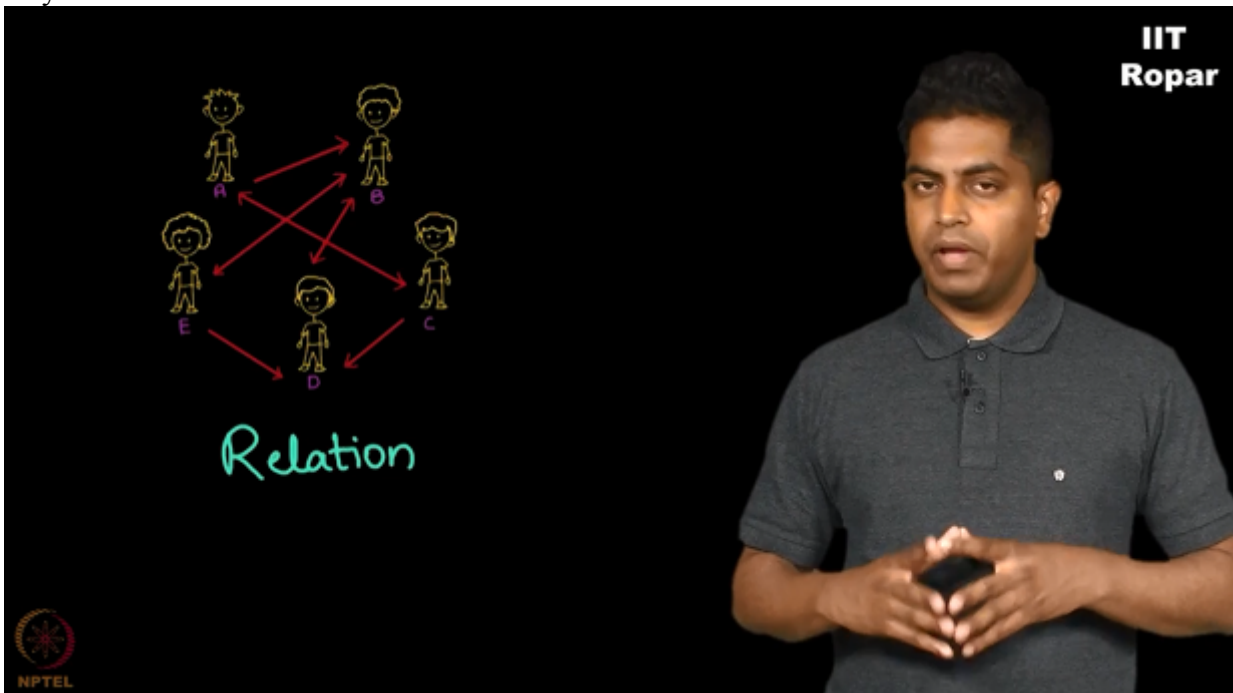
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NPTEL ONLINE COURSE
Discrete Mathematics
Relations
Cartesian Product
With
Prof. S. R. S. Iyengar
Department of Computer Science
IIT Ropar



Let us start with an example.



Assume there are two people A and B. There are so many ways in which one might know the other person. One way is they don't know each other. Other way, second way is A knows B but B doesn't know A, second way. Third way would be B knows A but A doesn't know B, third way. The last way, as you would have guessed, is A knows B and B knows A. You see there are four different ways in which A and B can know each other, not knowing each other is also a way.



Let us take five people A, B, C, D and E. These are five people. They might know each other in many different ways, right. One such way is probably this, as you can see, A, B, C, D, E know

each other in a very complex way; some people know someone, some people doesn't know -- they don't know someone else, and so on. This is actually called a relation.

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$S = \{ \text{A}, \text{B}, \text{C}, \text{D}, \text{E} \}$

Relation

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By a relation we mean given a set of, let's say, five people, these five can be anything, A, B, C, D, E, let's say. There could be any kind of relationship between people and one such diagram is called a relation. It will be clear to you people very soon, but then just concentrate on this fact that given a set S, there are many ways in which we can define a relation, you see.

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Everyone knowing everyone else is a relation, as you can see here. Nobody knowing anyone is another relation, correct. So they are extremes basically, situation where nobody knows anyone to situation where everyone knows everyone. So here is -- basically there's a spectrum of

different possible relationships between these two things. Each one of them is called a relation, right.

Let's see more of this very soon, but all you need to know is given a few people represented by dots and relationship between them basically about who knows who, this entire thing comparisons of what we call a relation.

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