NPTEL
NPTEL ONLINE COURSE
Discrete Mathematics
Relations
Partition - Part 1
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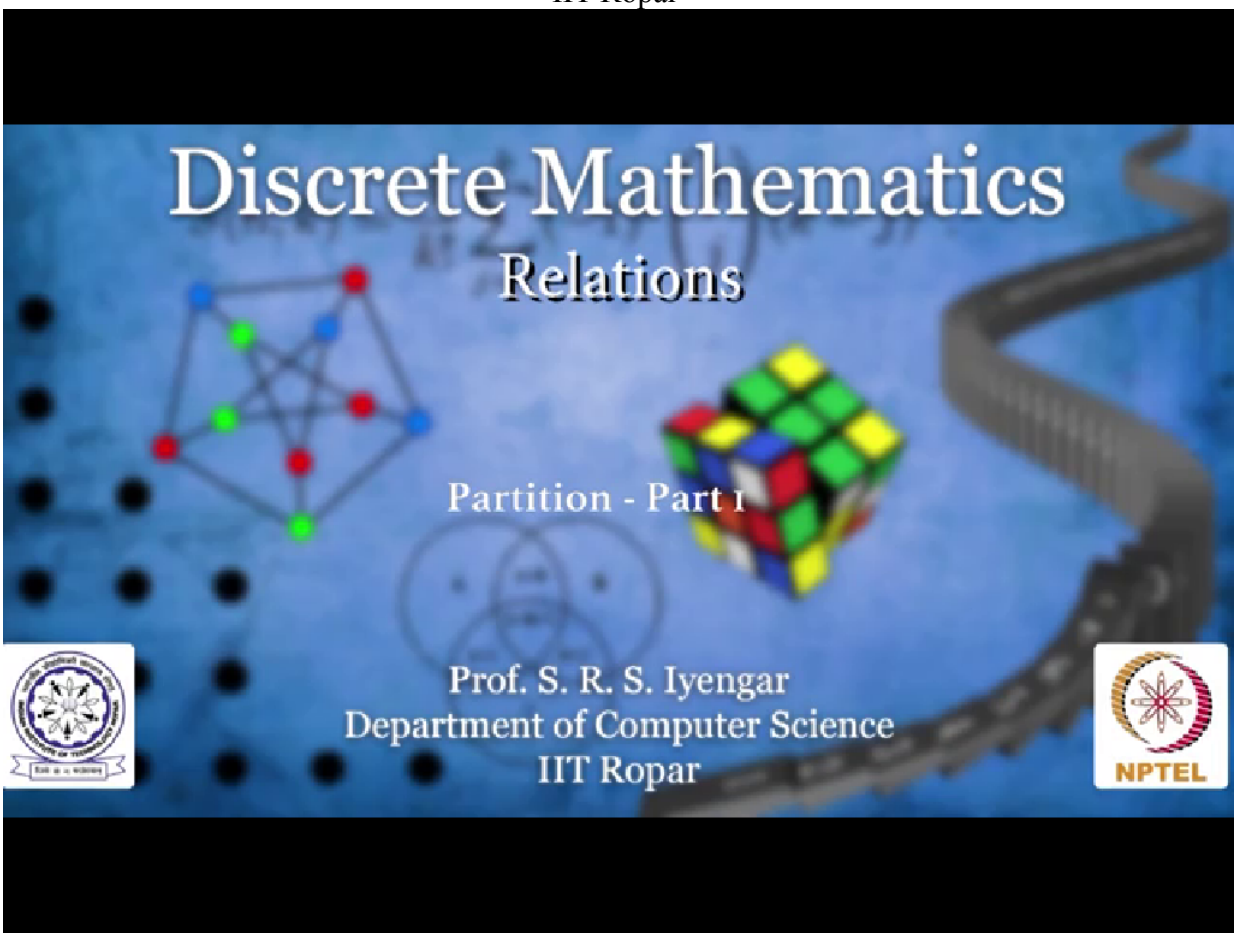
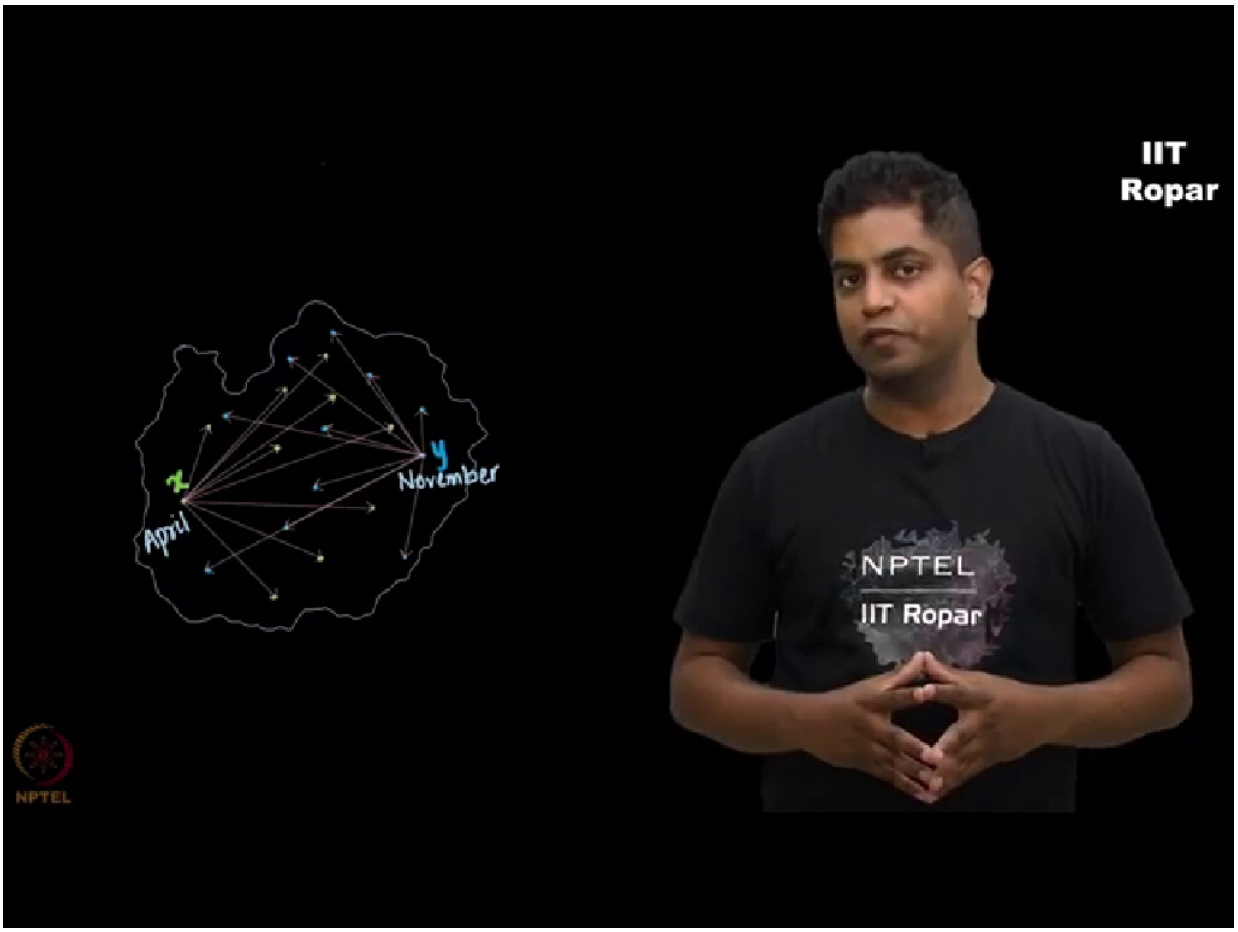
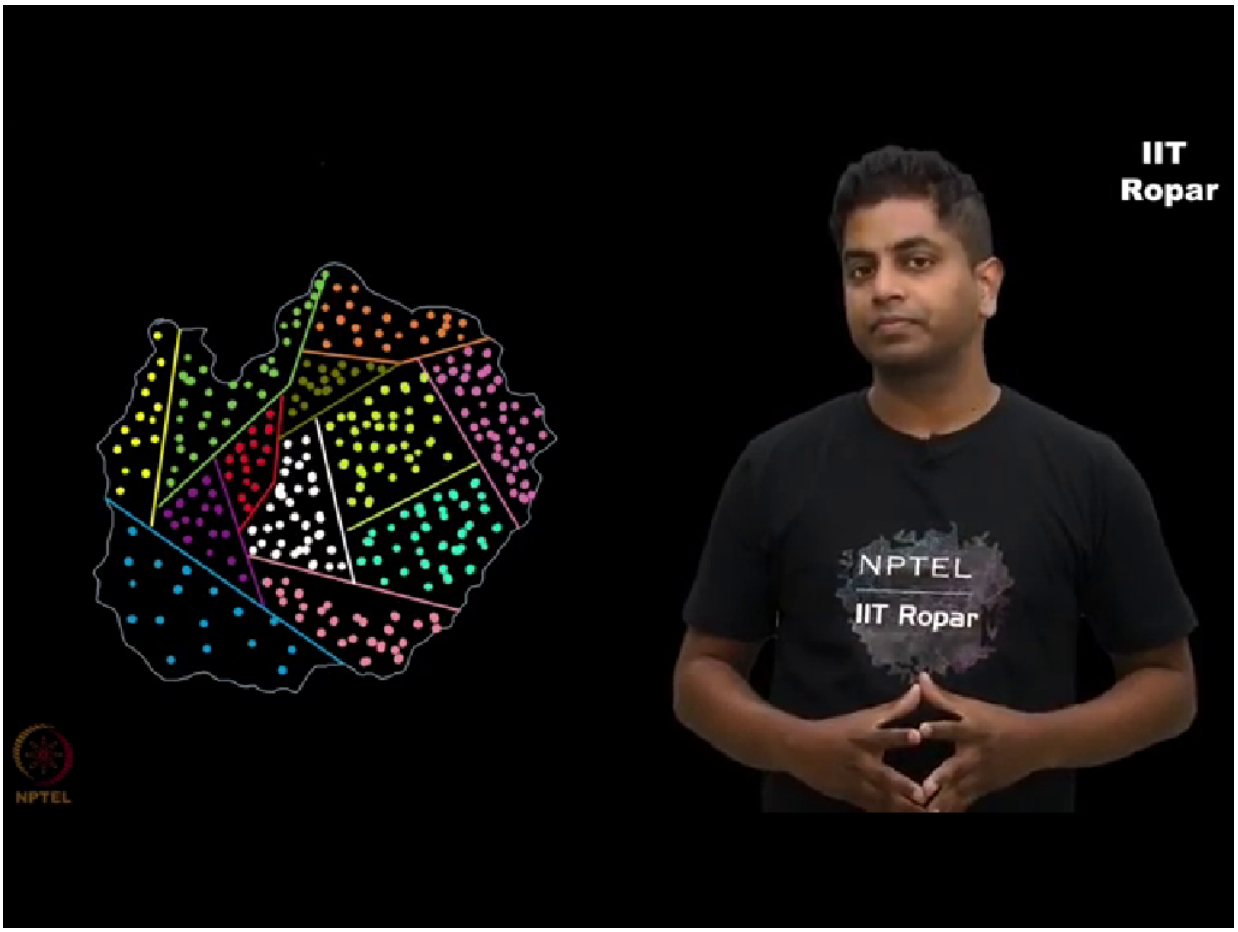


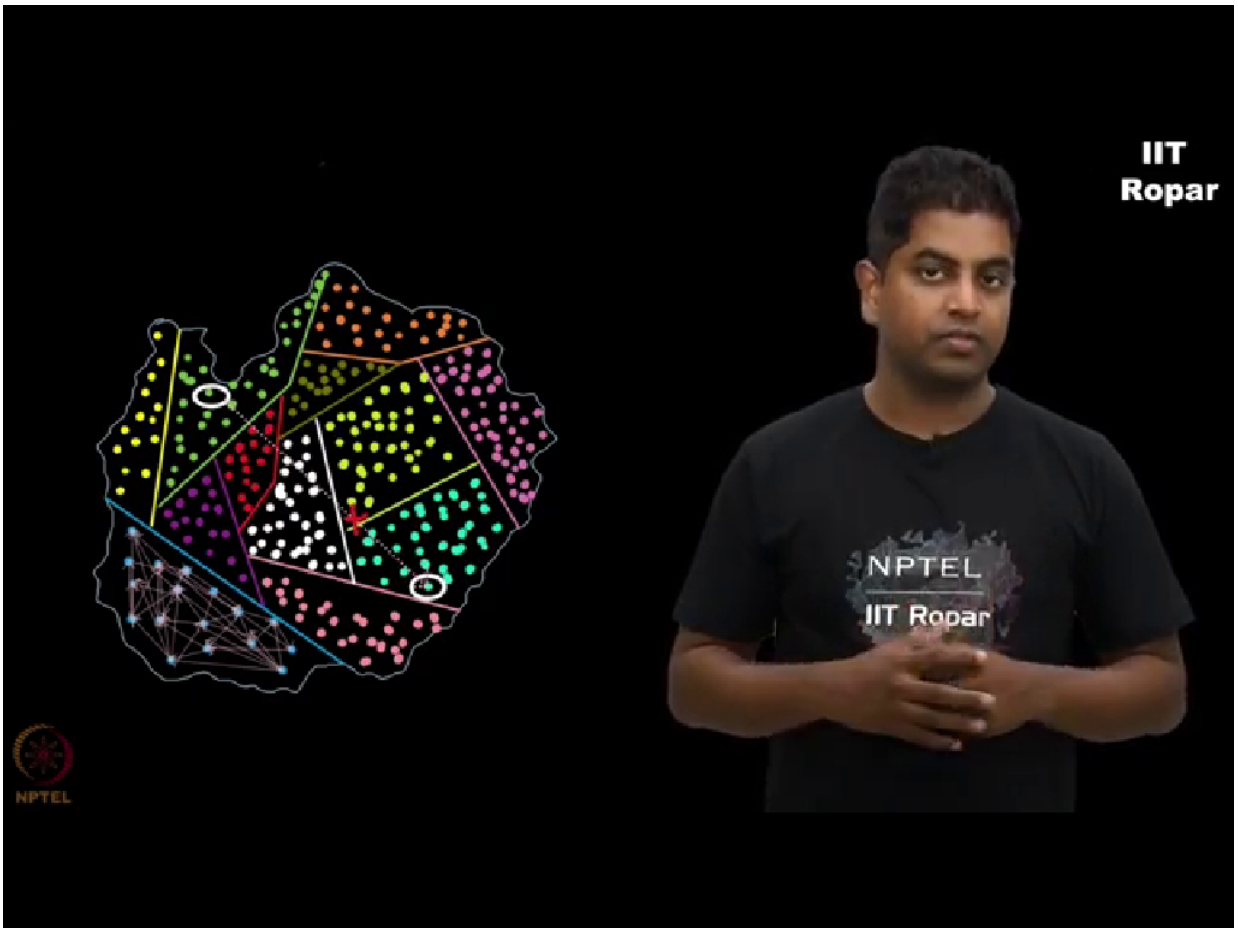
Let's get back to the example of a town full of people where two people are related if they have the same birth month. There is something that we observe here. Any random person you take like say an x belonging to the set S, his month of birth happens to be April. Don't you think he is related to everyone who is born in April? Right? So is true with someone else, let's say y who was born in November, and this chap will be related to everyone born in November.



Let us observe something in this example. You see the entire town comprises of people. Each and every person is born in one month or the other. Let us take everyone who were born in January. Call them the January cluster. Let's take everyone born in February and call it the February cluster. So on and so forth.



Do you observe something? In the January cluster, every single person born on January is present of that town. Any two people inside this cluster are related. Any (a,b) where a and b are from this cluster satisfy this property that (a,b) belongs to R.
On the contrary, if you take two people across clusters, they are obviously not related.



So let's summarize. Take any two people within any of these clusters. Pick a cluster. Pick two people from the cluster. You will see that they are related. Pick two people across the clusters. They are not related. This happens to be a very important observation about equivalence relations in general.

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