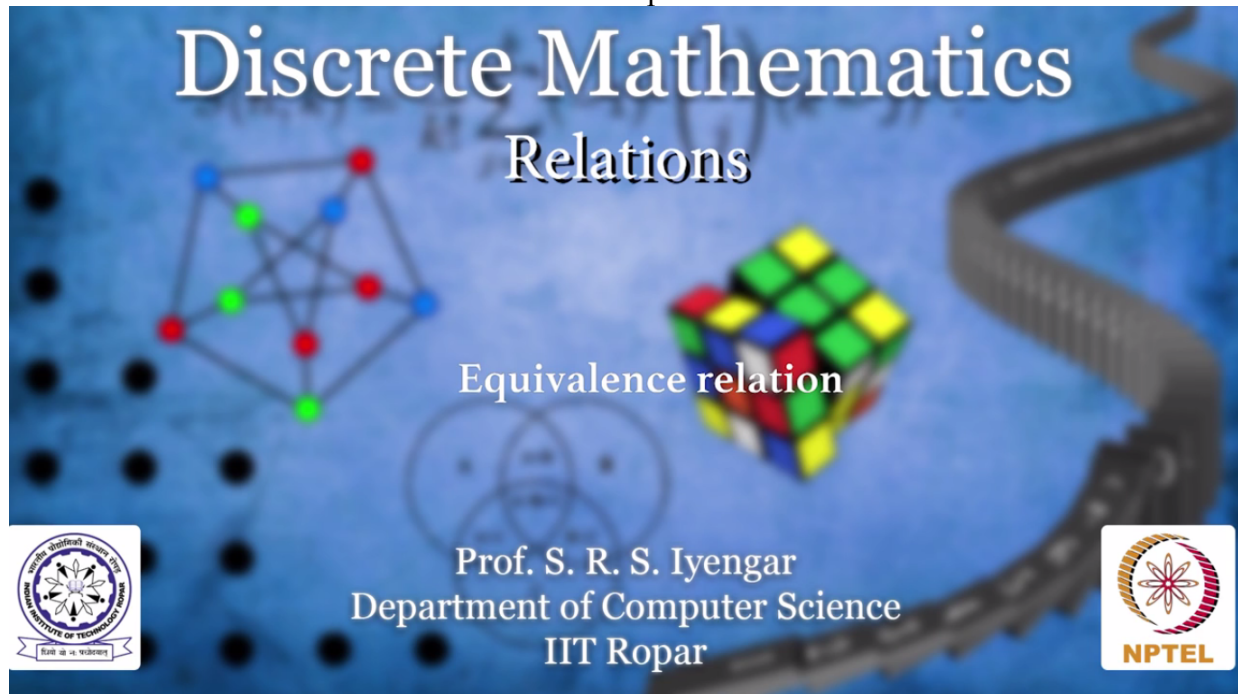


NPTEL
NPTEL ONLINE COURSE
Discrete Mathematics Relations
Equivalence Relation
With
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Let us start with a couple of examples. First example, assume I walk into a town, a town full of people. Let this be my set S . I called two people to be related, let's say, a and b are related. (a, b) belongs to R if a and b both are born in the same month. Assume here is a person, here is a person and they both were born in November. Then this, this belongs to R , (a, b) belongs to R . This is one example.

The second example is, assume I go to a school, my set S here is going to be a school full of kids. Any two kids are related (a, b) belongs to R , S is set of all children in the school. (a, b) belongs to R if a and b have the same blood group. Assume a was of blood group B positive, b is also of blood group B positive then (a, b) belongs to R . In case they are of different blood groups, that don't belong to R . (c, d) is of different blood groups, then they do not belong to R . What do you see common in these two examples? In fact, these two relations are more or less the same. How? Do you observe that both the relations satisfy the three properties, namely reflexive, symmetric and transitive. It's easy to verify this. Such a relation is called an equivalence relation.

So what's an equivalence relation? Something that satisfies reflexive, symmetric and transitive, all three put together.

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