NPTEL
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Discrete Mathematics
Mathematical Induction and pigeonhole principle

MI - Inequality 1

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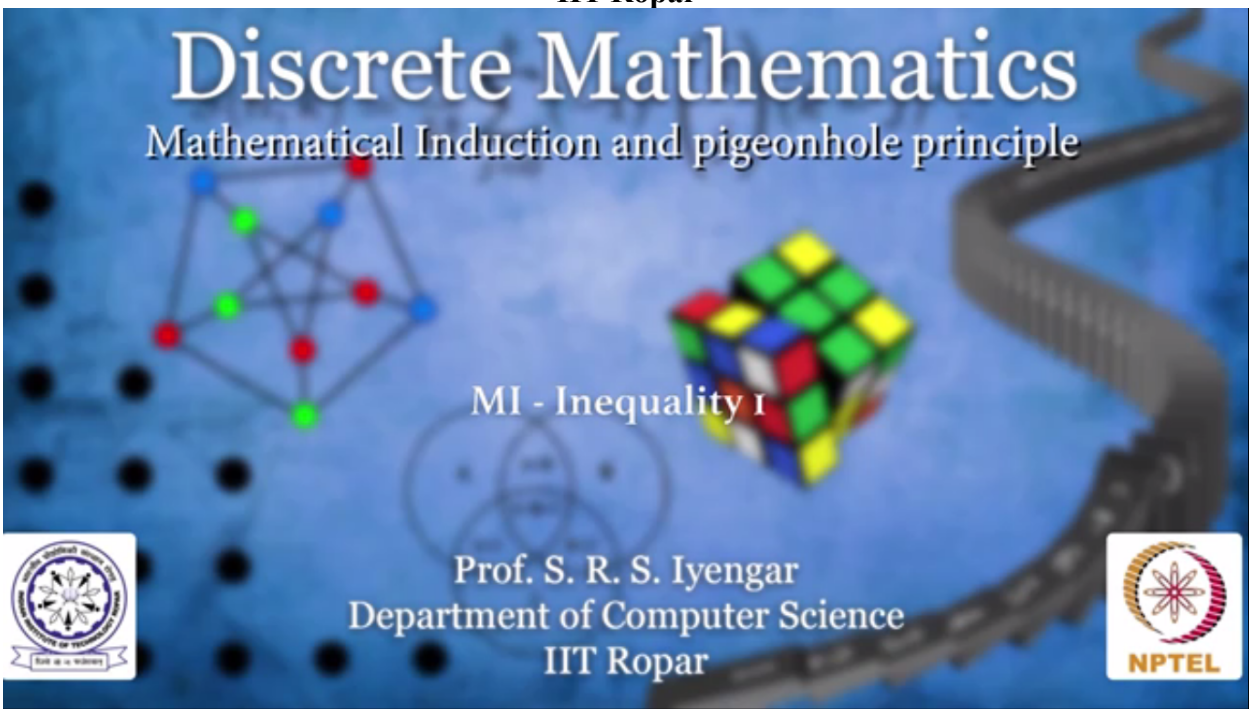
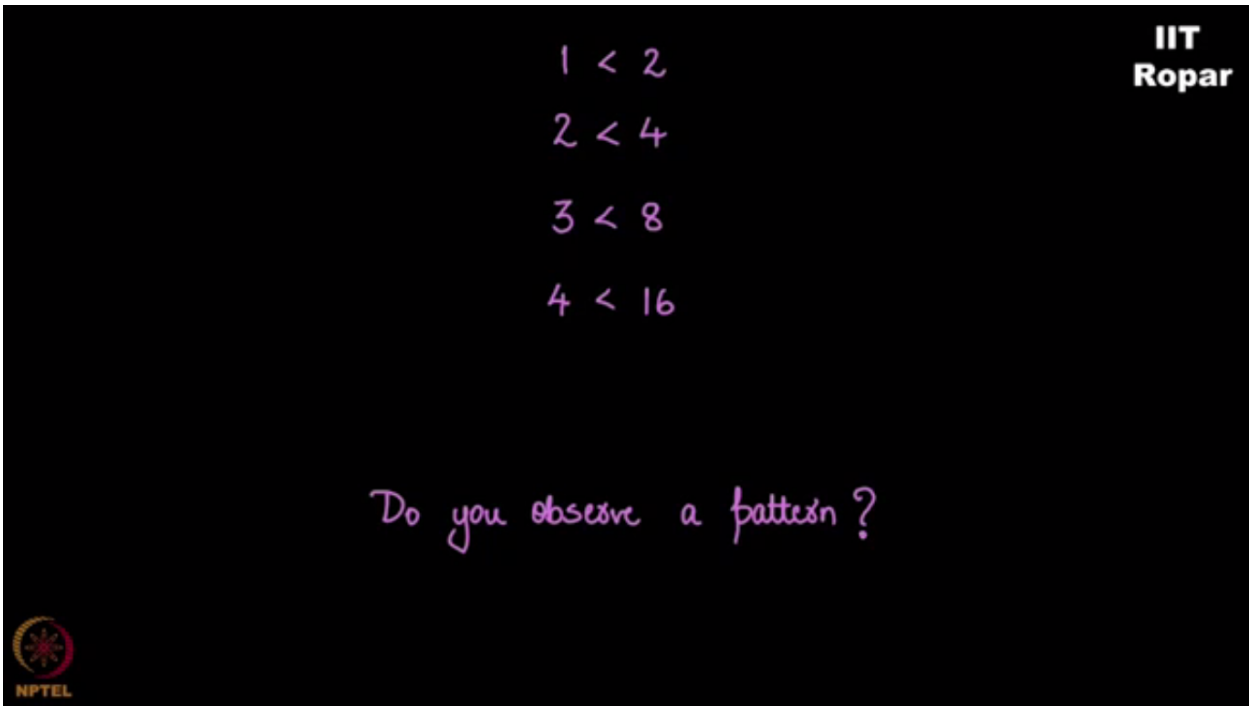


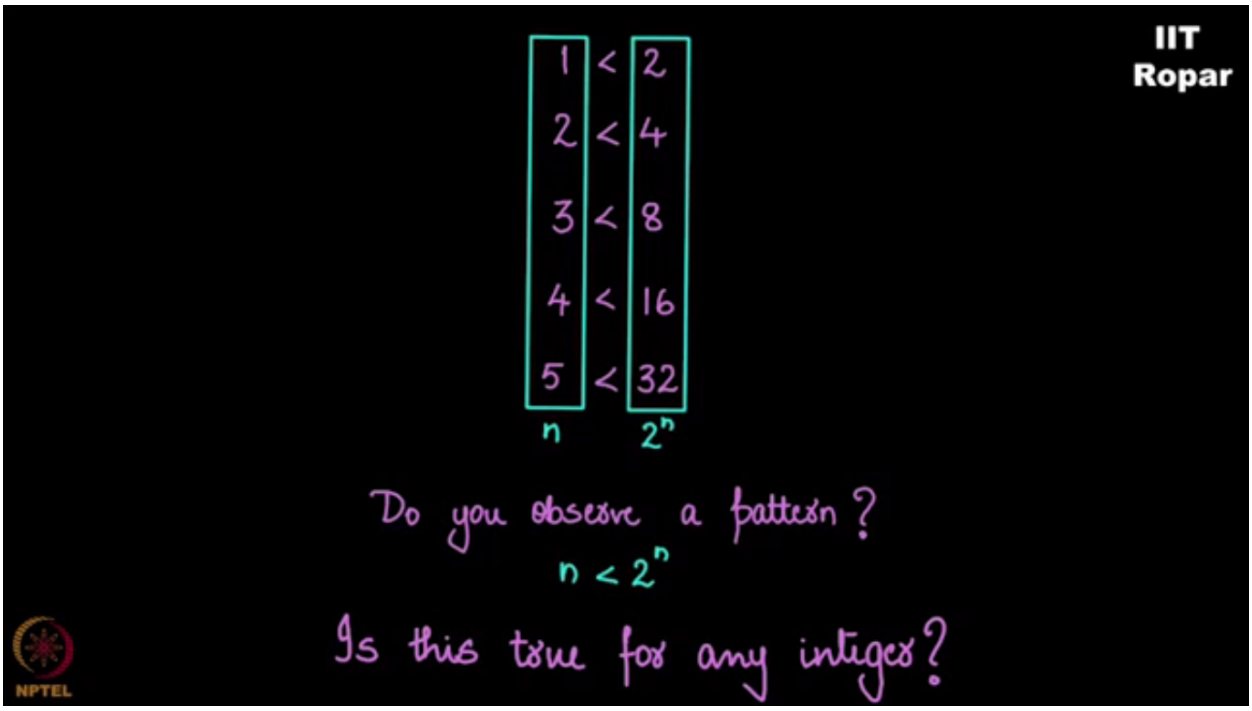
Observe the inequalities which I'm going to write now. 1 is less than 2. Very obvious. 2 is less than 2^2, which is 4. 3 is less than 2^3, which is 8. 4 is less than 2^4, which is nothing but 16.



Do you observe a pattern among these four inequalities?

Let me take another one. 5 is less than 2^5, which happens to be 32. Now do you observe a pattern here?

If I consider the left hand sides as n and the right hand sides as 2^n, you see there is an n here and I am going to take the power, the same power of 2. So it is 2^n here. Do you observe that n is strictly less than 2^n? But is this true for any integer we know or any positive integer we know or any real number we know?



Let us prove it by induction.

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