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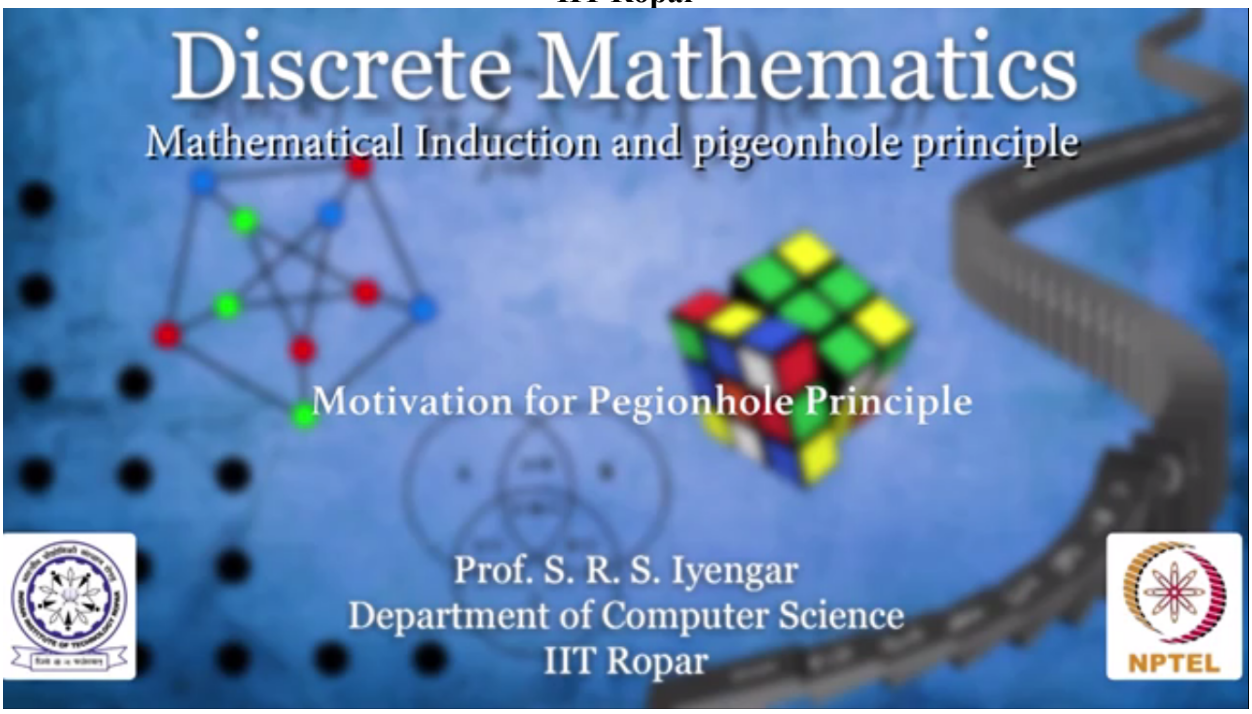
Discrete Mathematics
Mathematical Induction and pigeonhole principle

Motivation for Pegionhole Principle

Prof. S. R. S. Iyengar
Department of Computer Science
IIT Ropar



Imagine 5 friends trying to share 4 seats in a bus during their journey. Don't you think there is at least one chair which is being shared by two people assuming they all sit and assuming they don't stand? It's only obvious that when you have 4 pigeonholes and 5 pigeons and when you drive all these pigeons on to these holes, you are for sure that there is at least one pigeonhole being shared by at least two pigeons. Sounds complicated, but it's a very straightforward concept. Right?

Let me give you another illustration of what I am saying. Take 8 people and ask them their day of birth. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday. Right? If you take 8 people, you can guarantee yourself that there has to be at least 2 people sharing the same day of birth. This is popularly called the Pigeonhole Principle.

Just like a needle, the very technology of a sharp instrument like a needle comes in use in surprisingly many places. As simple as a needle can be used to pluck out a thorn, it can be used as a surgical instrument. It can also be used like a weapon. Simple, yet very well applied.

So is the case with Pigeonhole Principle. It appears so simple. You probably are even wondering why are we discussing something as simple and straightforward as this, but I will illustrate a couple of questions where you will have no clue that something as silly and simple and straightforward as Pigeonhole Principle will be of any use. Let us see such examples.

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