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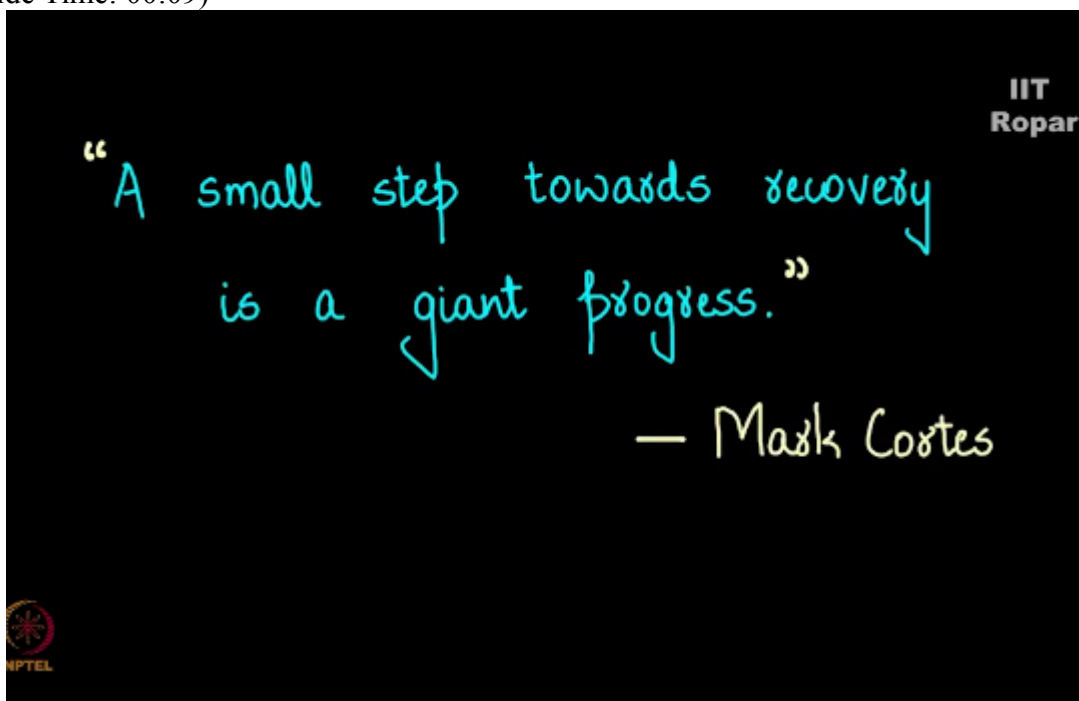
NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Recurrence Relation

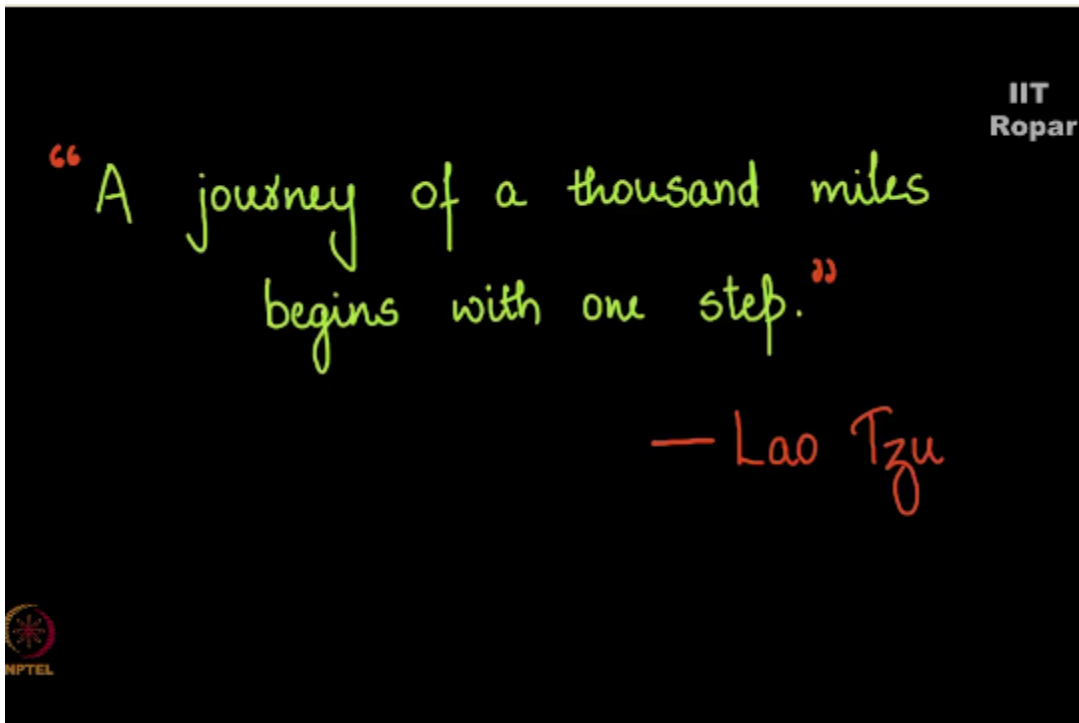
Motivation for recurrence relation

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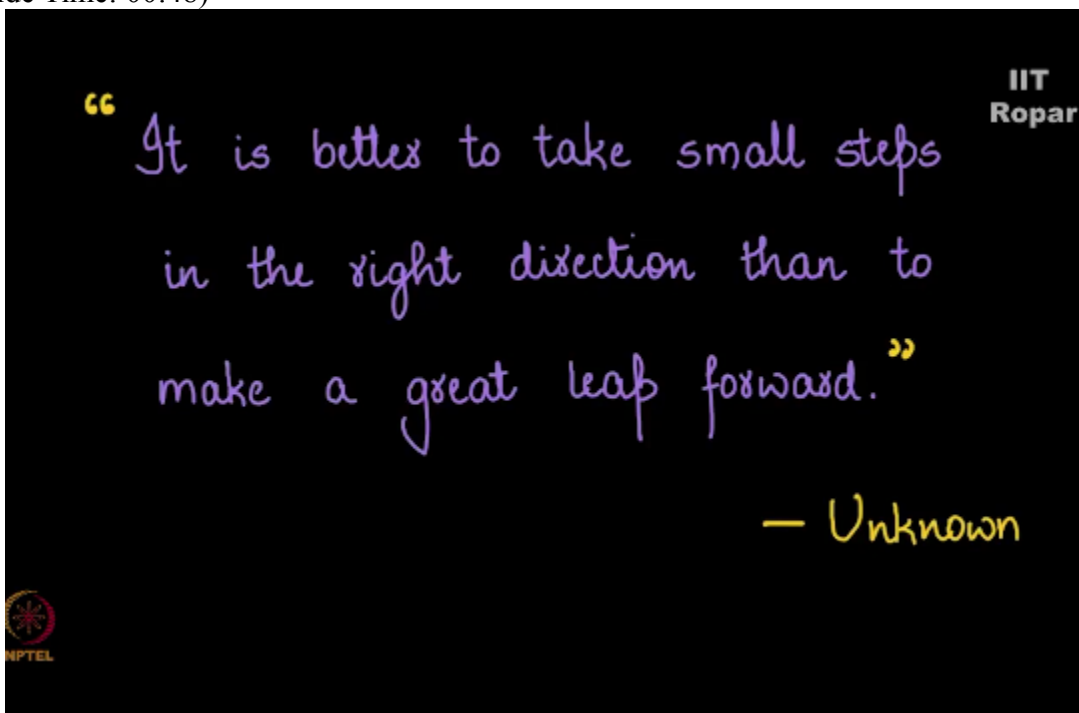
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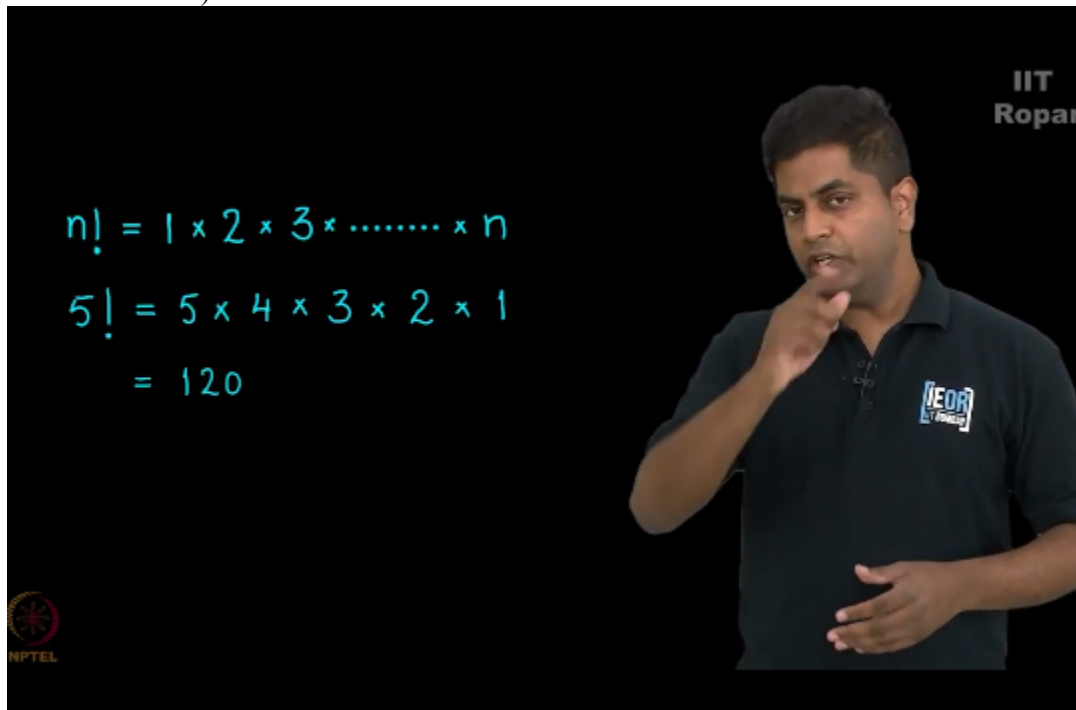
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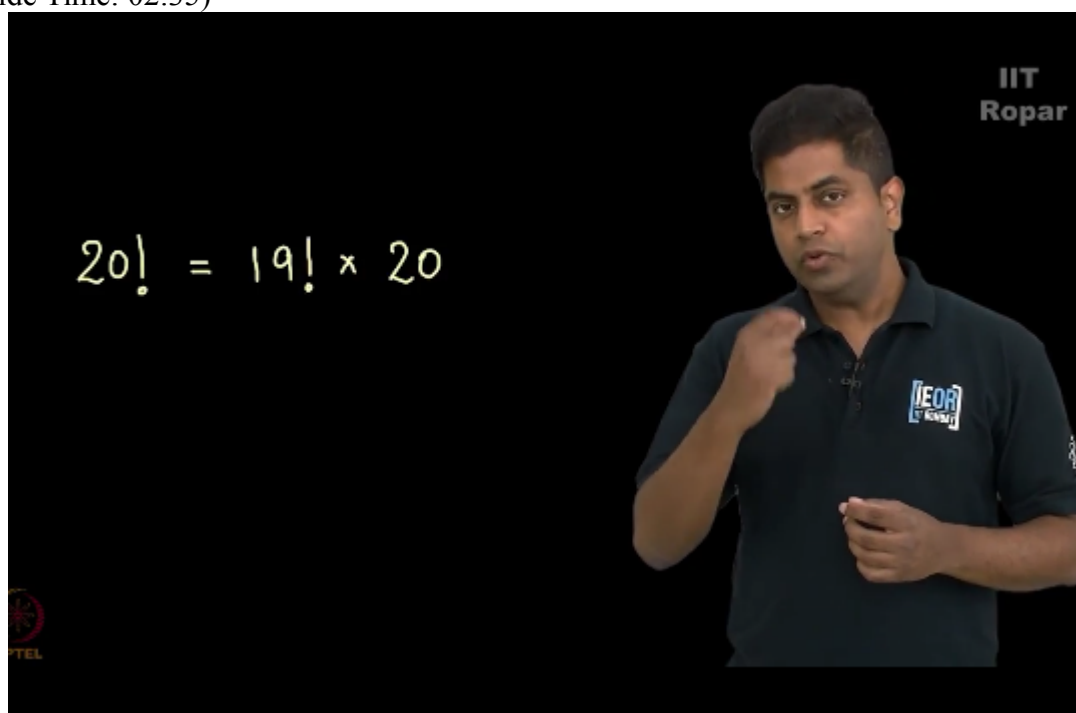
[Music] What do all these quotes have in common? They all say more or less the same thing, what is that? Any big problem in our life can be broken into smaller chunks and we can solve it, right, so start taking baby steps and there you are handling a giant problem, as we have been talking computer science is all about solving problems, problems of various complexity, complexity generally is in terms of the humungous data that is given to us which we must crunch and then give back the answer, sometimes the problem appears to a computer as though it's too big, we may have to see that big

problem as several problems of small size, and handle only a small size problem and then collect the answers, and give the answer for the bigger problem.

As a very, very naive example let me talk about computing factorial of a number, how do we compute factorial of a number? It's very obvious, let's say fact of N is $1 \times 2 \times 3$ up to N, so fact of 5 is $5 \times 4 \times 3 \times 2 \times 1$ which is 120 and so on,
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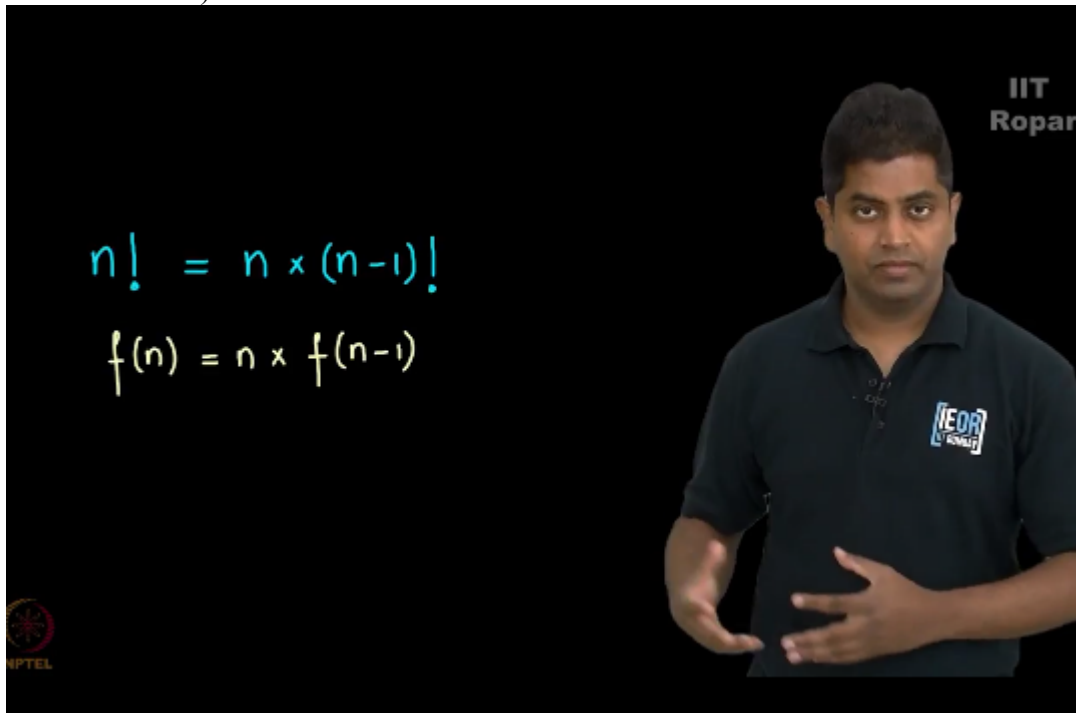


correct, but then do you observe something to compute fact of 20 we can compute fact of 19 and then multiply that with 20,
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so you need to have a keen eye to understand what's happening here, all that I am saying is factorial of a number is probably hard to contemplate and compute, but factorial of a number is nothing else but that number times factorial of one number less than that number, that's what I mean by fact 10 is 10 times fact of N-1, see what's happening here? Do you see a function defined by itself?

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