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Discrete Mathematics
Recurrence Relation

A note on the proof

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The proof involves some symbolic manipulations that is mostly not very intuitive, but the idea behind the proof is just this, we will show that whenever you have a recurrence relation of the form AN = C1 AN-1 + C2 AN-2 that is Nth term is defined by some constant times the previous term and constant times the previous to previous term, the solution will always be of the form AN = alpha 1 X1 to the N + alpha 2 X2 to the N, the proof goes in a way where we plug in this AN's formula in the recurrence relation and show that it is actually satisfying it.
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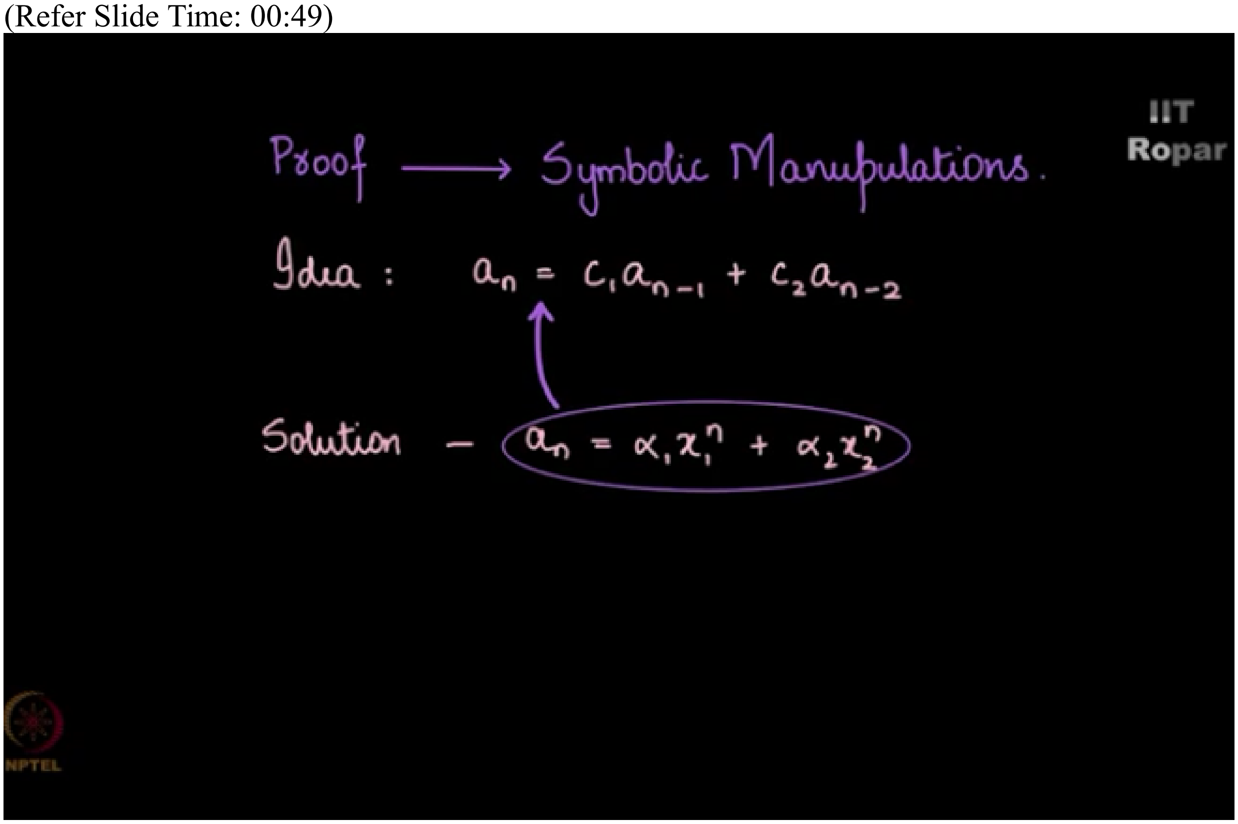

Now in my humble opinion I feel whenever we go ahead and teach such complicated, this proof is slightly complicated non intuitive, okay, so whenever we go ahead and teach proofs you will miss out on the big picture, the big picture here is a recurrence relation, okay, so let's say A3 is A2 + A1, AI is AI–1 + AI-2, a Fibonacci sequence,

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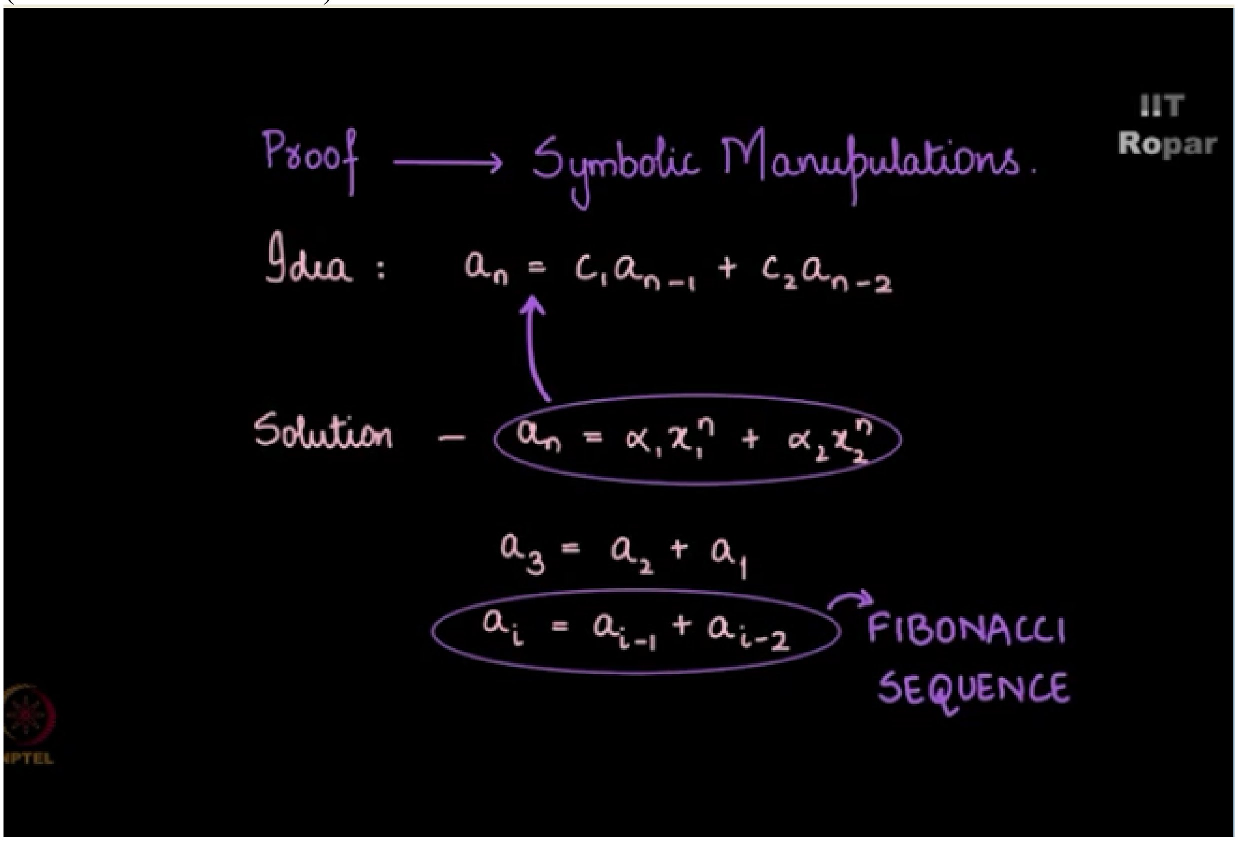

if it starts with 0 and 1 as you can see, right, so a recurrence relation the spirit of which is actually captured by computational problems, if he spend a lot of time proving all the cases you will not see the most important point that a computer science student is supposed to see, so what we'll do is in the interest of not demotivating you all we will not get into the proof of this theorem right now, however we will look at the proper proof at the fag end of this chapter, as of now I'll assume this result and go ahead, solve a few problems and connect this idea to computer science.

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