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Discrete Mathematics

Let Us Count

Catalan Numbers - Part 1

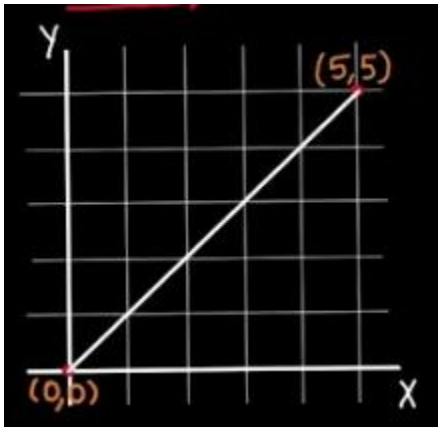
Prof. S.R.S Iyengar

Department of Computer Science

IIT Ropar

We posed a question in the beginning of this chapter and told you that we'll be covering it at the end of the chapter. Here we present the concept of Catalan numbers. This concept appears in many works of computing.

Remember this problem that we started off in the beginning of this chapter? In how many ways can one start from (0,0) and then reach (5,5) without crossing the diagonal.



This is a complicated problem and it involves some different method that we have not seen so far. Let's see how to solve this problem now.

Let me ask you a puzzle here. If I start from the point (0,0) and if I have to reach the point (5,5) in how many ways can I reach there? What are the total number of paths that I can take from (0,0) to reach (5,5)? So the question is in how many ways can I reach (5,5) if I start from (0,0). Think about it.

Please try solving this problem. The professor is now going to give a constrained version of the same problem. Let us see the problem now.

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