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Fun facts on Pascal's Triangle

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So the professor has introduced Pascal's triangle. Let us now see some fun and cool facts on it. So all of the numbers here in this Pascal's triangle represents the binomial coefficients but let me now start with the facts.

The second diagonal this one as you can see goes on as one, two, three, four, five, six, and so on and this diagonal represents the natural numbers. Each row, the first row 1, the second row 11,the third row 121, the fourth row 1331 and so on the sum of the numbers in each of the rows comes up to 2 to the n. So one is 2 to the 0, 1 plus 1 is 2 to the 1, 1 plus 2 plus 1 is 4 which is 2 square, 1 plus 3 plus 3 plus 1 is 8 which is 2 cube, 1 plus 4 plus 6 plus 4 plus 1 is 16 which is 2 to the 4 and so on.

As you observe it represents a power of 11 also. Now 1 is 11 to the 0 as you can see the numbers themselves 1 and 1 is 11 here, 11 to the 1. You can see a 121 here which is 11 square. You can see a 1331 here which is 11 cube and so on, isn't this interesting? You can also see that the triangle is symmetric. What I mean by symmetric? If you keep a mirror on 12620 and 70 that is on this line if you keep a mirror what you have on the left hand side is same as what you have on the right hand side. It is symmetric. We also see that the Fibonacci sequence is formed here. How? You have a 1 here, a 1 here and then 1 plus 1 is 2 here. Now 1 plus 2 is 3 here, 2 plus 3 is 5 years so 112358 and so on. So the Fibonacci sequence is seen like this.

Now observe this diagonal. What you see here is consider these two elements 1 plus 3 is 4 which is 2 square. Now these two elements is 6 plus 10 which is 16 this is 4 square. 15 plus 21 is 36

which is 6 square. So we got 2 square, 4 square, and 6 square. So all the numbers here on this diagonal as you can see if you take the sum of consecutive numbers you get them as square numbers. So this was another fact.

So these were some of the cool facts on the Pascal's triangle. I hope this was interesting.

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