Although the notion of factorial sounds so simple, there is something more to it which is not as simple as it appears. For example, you see 1 factorial is simply 1. 2 factorial is 2. 3 factorial is 6. 4 factorial is 24. 5 factorial 120. 6 factorial is 720, and so on. What should surprise you is 10 factorial is actually a big number; 3628800 roughly 3.5 million. Assume what is 10 factorial stands for? It stands for 10 people, a1, a2, up to a10 taking all possible pictures and let's say they take one second to move around so that they can take a picture with different configuration. Right. If you look at all possibilities if these 10 friends decide to take all possible pictures by quickly shuffling within a second time they will take 3628800 seconds which roughly is 42 days, roughly a month and a half. That's quite some time as you can see.

So if there are 10 friends they probably should not try taking all possible pictures. It probably works for one two and three maybe even four but not beyond that. Now what is more surprising is 15 factorial in terms of seconds is approximately 40,000 years and slightly down this ladder which is 20 factorial seconds is close to the age of the universe which happens to be 2 to the 60 seconds. Now you see this factorial up to 20 itself is a very-very huge number; such huge numbers are called the astronomical numbers. In computer science we encounter n factorial a whole lot. In fact some computation involves factorial number of steps and they are generally considered to be very hard or just not feasible or we say we should not think of computer programs that take factorial number of steps simply because we can never achieve it for even inputs of smaller size.

More details of it in the forthcoming chapters but you need to get the wisdom of the fact that factorial of a number when the number is very small appears to be very small but for a sufficiently big number let's say even a for a two-digit number factorial of this two-digit number happens to be too-too huge that they're astronomical in size.