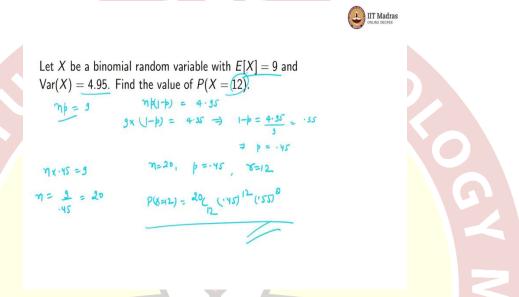


## IIT Madras ONLINE DEGREE

## Statistics for Data Science - 1 Professor. Usha Mohan Department of Management Studies Indian Institute of Technology, Madras Week 10 - Tutorial 3

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Let X we have binomial random variable with expectation this is 9 and variance is 4.95. Find the value of P(X = 12). So, from the given information first we have to find the value of n and p. So, as we know expectation of binomial random variable is given by np and which is given as 9 and variance of binomial distribution is given by np(1-p) which is given as 4.95.

So, from here we can put the value of np. So, we will get that  $9 \times (1-p) = 4.95$ , we will solve this, we will get that  $1-p = \frac{4.95}{9}$  which is nothing but 0.55. So, this implies that the value of p is 0.45, putting this value of p in np, we get  $n = \frac{9}{0.45}$  which is nothing is 20.

So, we got the value of n that is 20, we got the value of p 0.45 and we have here the value of r is 12. Now, we will use directly the formula for binomial distribution and we can see that this can be written as  ${}^{20}C_{12}$  0.45 the value of r that is 12, (1-p) that is 0.55,  $0.55^{n-r}$  that is nothing but 8, 20-12 that is 8. So, this will be our value of P(X=12). Thank you.