IIT Madras

ONLINE DEGREE

Statistics for Data Science – 1
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Week 6 - Tutorial 2

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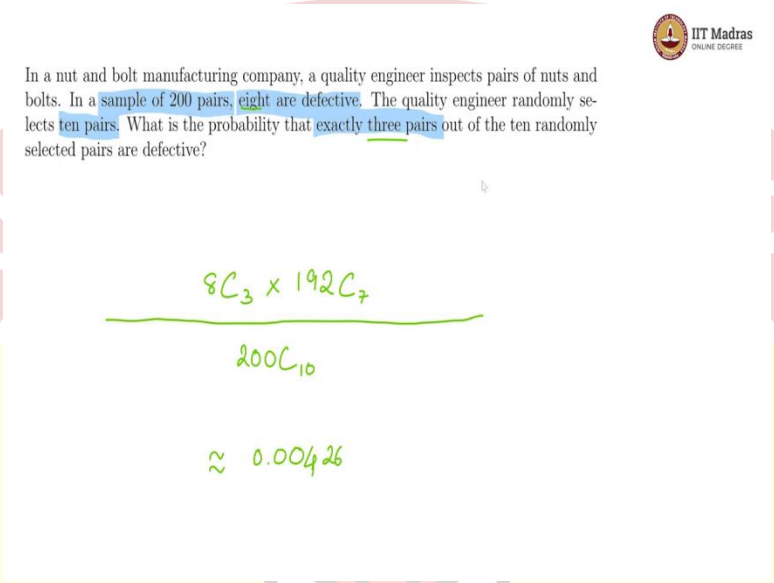

In a nut and bolt manufacturing company, a quality engineer inspects pairs of nuts and bolts. In a sample of 200 pairs, 8 are defective, so out of the sample is of 200 and 8 are defective. And the quality engineer randomly selects 10 pairs, so of these 200, the quality engineer is selecting 10 pairs. What is the probability that exactly three pairs out of the 10 are defective?

So, if we look at this as number of possibilities where our condition is being satisfied divided by the total number of possibilities. We can look at it this way the denominator which is the total number of possibilities will be $^{200}C_{10}$. So, you are picking 10 pairs out of 200 randomly and the number of ways you can do it is $^{200}C_{10}$ these are the total number of possibilities.

And now for these exactly three pairs to be defective those three should come from these 8, so that would be $^{8}C_3$ multiplied by the remaining 7 should come from the remaining 192 pairs. So, that would be $^{192}C_7$. So, this should be our answer, if you calculate it, it is going to come to about 0.00426. So, that is quite small, anyway this is the probability.