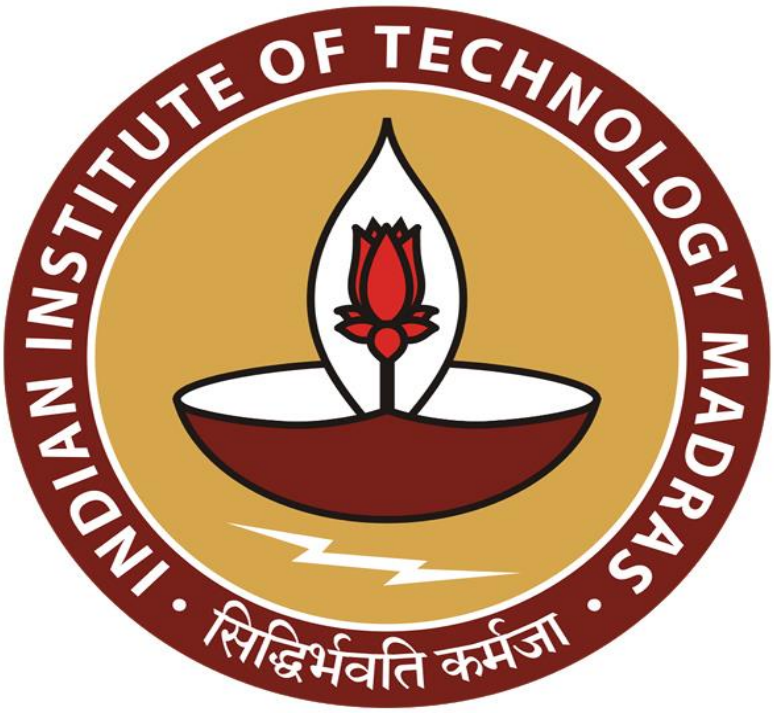

IIT Madras

ONLINE DEGREE

Statistics for Data Science – 1
Professor Usha Mohan
Department of Management Studies
Indian Institute of Technology, Madras
Week 6 - Tutorial 1

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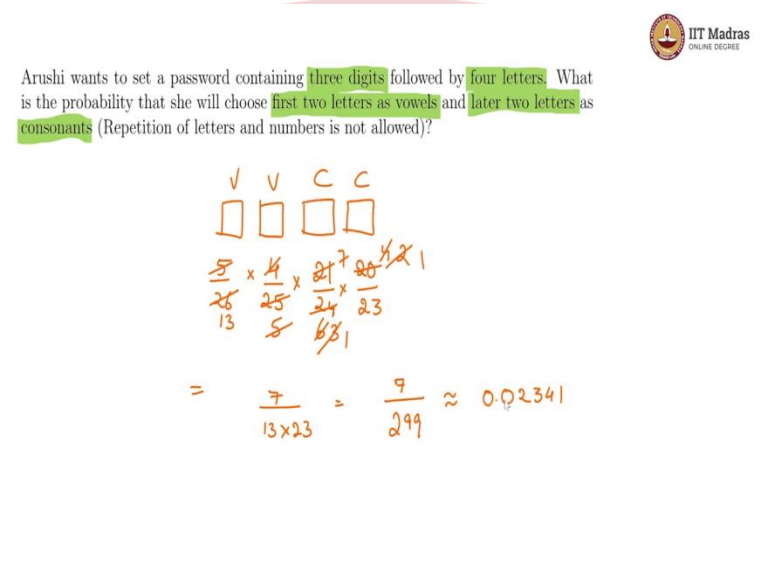

Hello statistics students. In this week's tutorials we look at problems related to probability. In this problem they are saying Arushi wants to set a password containing three digits followed by four letters and then they are asking what is the probability that she will choose the first two letters as vowels and the later two letters as consonants. Repetition of letters and numbers is not allowed.

So, the first thing we realize here is there is no condition which is set on the digits, so the digits are as good as not being there. So, we are only interested in the four letters. So, we will look at the probability regarding these four letters and here you want a vowel, this is also a vowel, this is a consonant, this is a consonant and there is no repetition.

So, let us see for the first box to get a vowel the probability would be $\frac{5}{26}$. Now, in the next box this vowel, the one in the first box should not come up, so we get $\frac{4}{25}$ because one letter is taken away and then we have 24 letters left but these are consonants now, so you have 21 consonants so $\frac{21}{24}$ here and lastly this would be 20 consonants remaining divided by 23.

So, this calculation is what we are supposed to do, if we can cancel out some things let us try 4×6 is 24 and 5×5 is 25 so 5×4 is 20 again, so two 2 two 3 two 1 and there is 13 so you will now get, actually we can further cancel three 1 and this is 7. So, you now get $\frac{7}{13 \times 23}$ which is equal to $\frac{7}{299}$ which is roughly equal to 0.02341 so this is the probability.