

STATISTICS FOR BUSINESS

TEACHER: JOSEMARI SARASOLA

SPECIAL COVID-19

VALIDATION: Goodness of fit: chi square test

Hello. First of all, we have to learn about a new distribution: chi square distribution. Look at Wikipedia chi squared distribution to know the exact notation (its like a curve X letter powered to 2). You can see there it has only one parameter: k, or n, as we will call it. This parameter is called the NUMBER OF DEGRESS OF FREEDOM. The most important about this distribution is how to deal with the corresponding table. Look in Gizapedia for “statistical tables”: chi square distriobution is tabulated on page 3. As you can see there, this table gives for different n parameters (degrees of freedom) and different “below” or “lower” probabilities (probabilities towards left), the corresponding values for the distribution. So, it’s like the inverse of the normal table, here we seek for the probability and the table gives us the value. Be careful, because some other tables in the videos give values for “above” or “upper” probabilitiers. Take the table from Gizapedia, if X distributes chi square with n=4, the value leaving downwards a 0.99 probability (upwards a 0.01 probability) is 13.3. Ok?

Now we have to learn another validation topic. After the estimation of parameters (remember research about Punjab incomes) we have to test if variable really follows the distribution or model given in advance (for example exponential, for income). To validate the model we may use the chi square test.

Chi square test applies to discrete and continuous models.

Now you can see the following videos OR GO DIRECTLY TO THE PROPOSED WRITTEN LESSON (IT’S A VERY GOOD LESSON)

In this first video you have a simple example about the application of chi square test to a discrete distribution. Pay attention: it’s a simple problem and explains the main steps of the test, but be careful the table he uses gives the probability upwards (compare his table and our table in Gizapedia):

https://www.youtube.com/watch?v=b3o_hjWKgQw

Now look at the next second video. There the teacher applies chi square test to a normal distribution, in a 4 videos series (total 30 min approx.). He gives very detailed (sometimes too detailed, it s a little bit boring) explanations, but you should pay attention at these two issues :

(1) first and last interval are set till infinity in order to cover all the support of the normal distribution, (2) degrees of freedom is no of intervals minus 1 (as usual) MINUS THE NO OF PARAMETERS ESTIMATED. THIS IS VERY IMPORTANT:

<https://www.youtube.com/watch?v=HabIKLG92MQ> (THIS IS ONLY THE 1ST CHAPTER). IN TOTAL YOU HAVE 4 VIDEOS

Now take a look at this written proposed lesson: here they explain 3 situations (discrete qualitative model, like in the 1st video; discrete quantitative model, not explained in videos, and continuous model , like in the second video:

http://www.cimt.org.uk/projects/mepres/alevel/fstats_ch5.pdf

NOW YOUR TASK IS:

FROM THESE NOTES, SOLVE

5TH PROBLEM FROM 5.1 SECTION

4TH PROBLEM FROM 5.2 SECTION

2ND PROBLEM FROM 5.3 SECTION.