edX

4. Are Selected Jurors
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4. Are Selected Jurors Representative of the Population?
Example of Chi Squared goodness of fit testing

3/3 points (graded)
In lecture you saw the following data:

Race	White	Black	Hispanic	Other	Total
# jurors	205	26	25	19	275
proportion in county	0.72	0.07	0.12	0.09	1

First row: Number of jurors by race, totalling 275
Second row: Proportion of population in a particular county in US by race, totaling 1

Design a χ^2 test to see whether or not the jurors selected are representative of the population in the county. Denote by T_n the test statistic for this test.

What is the number of degrees of freedom of the asymptotic distribution of T_n. In other words,

$$T_n \xrightarrow[n\to\infty]{(d)} \chi^2_\ell$$

for $l =$ [3] ✔ **Answer:** 3

Evaluate T_{275} on the given data set. (Answer accurate to 2 decimal places.)

$T_{275} =$ [5.889610389610387] ✔ **Answer:** 5.89 $\quad 275\left(\frac{\left(\frac{205}{275}-0.72\right)^2}{0.72} + \frac{\left(\frac{26}{275}-0.07\right)^2}{0.07} + \frac{\left(\frac{25}{275}-0.12\right)^2}{0.12} + \frac{\left(\frac{19}{275}-0.09\right)^2}{0.09}\right) \approx 5.88961039.$

What is the p-value of this test?
(Answer accurate to 2 decimal places.)

You could use this table or software such as R to find the quantiles of a chi-squared distribution.)

p-value: [0.1171] ✔ **Answer:** 0.12

Solution:

[Submit]   You have used 1 of 4 attempts

ℹ Answers are displayed within the problem

Discussion

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