STAT 231 December 2,2016

Review video: Dec 8, 2016

OH: on Learn

Roadmap

- · Goodness of fit tests.
- · Pest for independence of categorical variables.
- · Pest of equality of proforhous
- · Fual few points of Statistical Inference
- · Examples. /kpplications from real

TESTS FOR GOODNESS OF FIT Objective: To test whether the data set that we have follows a certain distribution X_1, \ldots, X_n Sample gris... 2n } Ho: X1 ~ f(21; +) 0 = vector of parameter

We use the pakelihood Ratio Test
Stabolte $\Delta(to) = 2 \sum_{i} Y_{i} \log \frac{Y_{i}}{E_{i}}$ $Y_{i} = 0$ Observed frequency in

category i

E: Espected frequency in

Category i, under the ass:

that Ho is true.

Result.

Result 1 (60) ~ 2 n-k-1 n-k-1n: # of calegories k: # of parameters of 8 we had to estimate

under Ho

Example X_1, \dots, X_n n = 50. $\bar{n} = 200$

Ho: Xin Eap (a)

(=1)...n.

Step 0: Divide the observations into different groups, and compute the observed frequency of each group. Your data set is large Step 1: Find the MLE of & under lte null hypothesis. A= == 200

8

Step 2: Estimate the probability of each Calegory 50 P(cettying 2): $\int \frac{1}{B} e^{-\frac{3}{1}B} dx$ $= \int \frac{1}{200} e^{-\frac{3}{200}} dx$

Step 3: alculate the expected
Aequencis li n=sample
el: n x Pi Sire.

Step 4 2 (00) = 2 Jy. lh 9 /2. Compute value of the test-statishe Compute the p-value. >> >(4.)) P(X p-value : 11:4 R=1

(d, e] (e, f] 35

Test of undependence of attribute.

Objective: The data is divided uto two categories. Gest Test while the two categories are undependent

Examples.: To test whelker
there is an association between
CS major and having a Canadrani
home town

Contingency table. Mon Ganadia. Relahvi Rock SET = 911/911+912

lest for no association A CS BII BIZ 21.

Ac Noncs B21 B22 d2 Aij: P(category i & j) x, = 1 (cs mayor) B. + P (Canadian Lome town)

No association implis

	CA	Non Gan.	
CS	35	43 78	
Korce	18	69	· - 4.
	53	. 16	5
	(0.	1-13	•

Ho Au) = <1.13. L=1,2?

)=1,2?

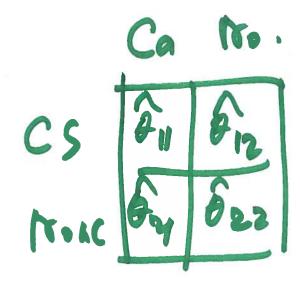
We have to estimate

2 BI

\Li=? 78/15

Bi: 53/165

B11 = 78 .53 165 166



Construct the Expected Frequency table Ca. Non Cana.

CS e11 e12

Moncs e21 e22

Cij = m x pag Oc;

Kikelihood ratio 122599

69 87 153. Column Total. Ho: Buj= dupy tijj m, =# of um in Row) CI = # of con. ui Ghn 1

of: (a-1)(b-1) a: # of rows b: # of columns.

Test for egnality of proportions

& Mal Femal =

Smo

testag for

Won

Webendence