ASSIGNMENT 5

CCS226-18

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2BSCS-1

MEKENI CARS WOULD LIKE TO DETERMINE IF THERE IS ANY RELATIONSHIP BETWEEN INCOME OF CUSTOMERS AND THE IMPORTANCE THEY ATTACH TO THE PRICE OF LUXURY CARS. THEY WANT TO TEST THE HYPOTHESES AT 1% LEVEL OF SIGNIFICANCE. THE DATA ARE AS FOLLOWS:

Importance Level/Income	Low	Moderate	High	Total
Great	83 66.98	62 64.61	37 50.41	182
Moderate	52 63.30	71 61.06	49 47.64	172
Little	63 67.72	58 65.32	63 50.96	184
Total	198	191	149	538

Red numbers are the computed expected (E_i) outcome.

E = (row subtotal x column subtotal) / grand total

(182 x 198)/538 = **66.98**	(182 x 191)/538 = **64.61**	(182 x 149)/538 = **50.41**
(172 x 198)/538 = **63.30**	(172 x 191)/538 = **61.06**	(172 x 149)/538 = **47.64**
(184 x 198)/538 = **67.72**	(184 x 191)/538 = **65.32**	(184 x 149)/538 = **50.96**

Given:

$\alpha = 0.01$

df = (rows-1)(columns-1)

= (3-1)(3-1) = 2 * 2

df = 4

H_0: There is no significant relationship between the income of customers and the importance they attach to the price of luxury cars.

H_1: There is significant relationship between the income of customers and the importance they attach to the price of luxury cars.

Formula:

$$\chi^2 = \Sigma (O_i - E_i)^2 / E_i$$

$$\chi^2 = \frac{(83-66.98)^2}{66.98} + \frac{(62-64.61)^2}{64.61} + \frac{(37-50.41)^2}{50.41} + \frac{(52-63.30)^2}{63.30} + \frac{(71-61.06)^2}{61.06} + \frac{(49-47.64)^2}{47.64} + \frac{(63-67.72)^2}{67.72} + \frac{(58-65.32)^2}{65.32} + \frac{(63-50.96)^2}{50.96}$$

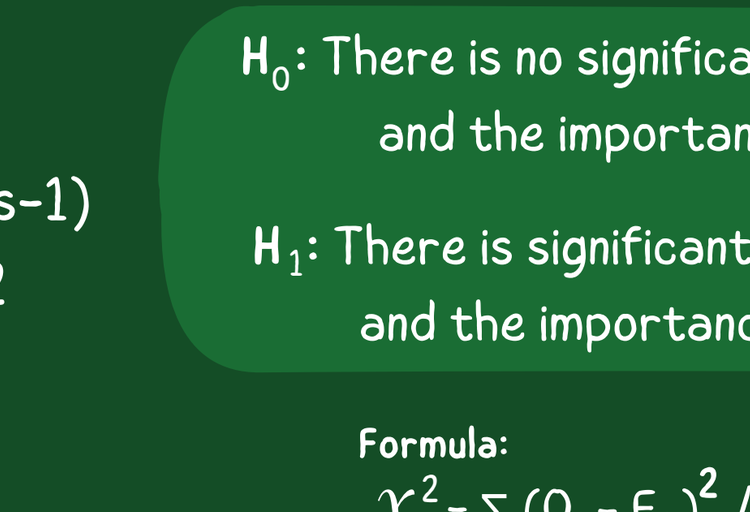
$$= 3.83 + 0.11 + 3.57 + 2.02 + 1.62 + 0.04 + 0.33 + 0.82 + 2.84$$

$\chi^2 = 15.18$

CV = 13.277

d	0.05	0.01	0.001
1	3.841	6.635	10.828
2	5.991	9.210	13.816
3	7.815	11.345	16.266
4	9.488	13.277	18.467
5	11.070	15.086	20.515

Click for table link



*Since CV < χ^2

Reject Null Hypothesis

Inference:

The results imply that there is significant relationship between the income of customers and the importance they attach to the price of luxury cars.