Process A produced 10 defective and 30 good units (40 units)

Process B produced 25 defective out of 60 units

What is the probability that the observed value could under the hypothesis that both processes have same quality

A: 40 : 10 + 30

B: 60 : 35 + 25

Text

Description automatically generated with low confidence

The probability that both processes are operating at the same quality is between 5% and 10%

from scipy.stats import chi2\_contingency

from scipy.stats import chi2

# contingency table

table = [ [10, 25],

          [30, 35]]

stat, p, dof, expected = chi2\_contingency(table)

print (expected)

prob=0.95

critical = chi2.ppf(prob, dof)

print('probability=%.3f, critical=%.3f, stat=%.3f' % (prob, critical, stat))

# p = 0.03

prob=0.90

critical = chi2.ppf(prob, dof)

print('probability=%.3f, critical=%.3f, stat=%.3f' % (prob, critical, stat))

# p = 0.13

probability=0.950, critical=3.841, stat=2.244

probability=0.900, critical=2.706, stat=2.244

**Con 0.95 p-value = 0.03 < 0.05 se rechaza, no son similares**

**Con 0.90 p-value = 0.13 > 0.05 se acepta que son similares**

**De modo que el minimo debe ser entre 0.90 – 0.95**

**A 95% se rechaza, los procesos son diferentes**

**A 90% se acepta, los procesos son iguales (a un 90% de confianza)**

**(X2 Critic) <> X2**

**Example 2.**

The number of men and women buying different types of pets.

dog cat bird total

men 207 282 241 730

women 234 242 232 708

Total 441 524 473 1438

The **aim** of the test is to conclude whether the two variables( gender and choice of pet ) are related to each other.

from scipy.stats import chi2\_contingency

#from scipy.stats import chi2

# contingency table

table = [ [207, 282, 241, 730],

          [234, 242, 232, 707]]

stat, p, dof, expected = chi2\_contingency(table)

prob=0.95

critical = chi2.ppf(prob, dof)

print('probability=%.3f, critical=%.3f, stat=%.3f' % (prob, critical, stat))

print(p)

probability=0.950, critical=7.815, stat=4.543

0.2085185646049144

**0.20 > 0.05 SE RECHAZA, HAY DIFERENCIA, NO SON IGUALES**

|  |
| --- |
| **from** scipy.stats **import** chi2\_contingency    data **=** [[207, 282, 241],  [234, 242, 232]]  stat, p, dof, expected **=** chi2\_contingency(data)    # interpret p-value  alpha **=** 0.05  **print**("p value is " **+** str(p))  **if** p <**=** alpha:      print('Dependent (reject H0) las muestras son diferentes')  **else**:      print('Independent (H0 holds true) las muestras son similares') |