

Stat 665 HW2 Prob 3.9

September 26, 2017

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In [28]: import scipy.stats as stats, numpy as np

In [29]: ctable = np.array([[307,461,270],[262,508,472],[16,56,69]])

In [30]: chi2, p, df, ex = stats.chi2_contingency(ctable)

In [31]: chi2, p, df

Out[31]: (63.821970741954601, 4.5559193424393558e-13, 4)

In [32]: chi2_g, p_g, df_g, ex_g = stats.chi2_contingency(ctable, lambda_ = 'log-likelihood')

In [33]: chi2_g, p_g, df_g

Out[33]: (65.442909051143943, 2.0756740637919442e-13, 4)

In [34]: (ctable - ex)/np.sqrt(ex)

Out[34]: array([[ 3.54747372,  1.02715989, -4.16766792],
                [-2.199961  , -0.77782631,  2.74290262],
                [-3.09587378, -0.47841592,  3.16720923]])

In [35]: n = np.sum(ctable)

In [36]: ed_sum, fund_sum = stats.contingency.margins(ctable)

In [37]: (ctable - ex)/np.sqrt(ed_sum*(n-ed_sum) * fund_sum*(n-fund_sum) / n**3)

Out[37]: array([[ 5.38972427,  1.78969507, -6.7618241 ],
                [-3.62006634, -1.46783691,  4.81987015],
                [-3.66331508, -0.64921759,  4.00212992]])
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