

Question 42

The data shown below arose in a study to investigate whether there is any difference in season of birth between people with schizophrenia and normal controls.

	Jan-Apr	May-Aug	Sept-Dec	Total
Schizophrenia	590	498	518	1606
Normal	1702	1416	1464	4582
Total	2292	1914	1982	6188

Calculate the contribution of the top left-hand cell of the table to a chi-squared statistic to test the hypothesis that the two groups show the same seasonal distribution. If the overall chi-squared statistic had value 0.0918, conduct a test of this hypothesis, stating clearly the number of degrees of freedom involved, the SP , and your conclusion.

2 degrees of freedom $\frac{2292 \times 1606}{6188} = 595^{[3]} = 0.0396$
 $0.1 < SP < 0.5$

Question 43

In a mood assessment exercise, patients in a psychiatric clinic were categorized daily at 3 pm as 'happy today' or 'not happy today'. Over a 64-day period of observation, a patient was recorded as happy on 25 days and not happy for the remaining 39, with a matrix of transition frequencies given by

$$N = \begin{matrix} & \begin{matrix} \text{Not happy} \\ \text{Happy} \end{matrix} \end{matrix} \begin{bmatrix} 27 & 11 \\ 11 & 14 \end{bmatrix}$$

- Assuming a Markov chain model for the moods swings for this patient, use these data to estimate the mood transition probabilities.
- Over the period, the number of runs expected in a Bernoulli model is 31.47. The observed number of runs was 23, giving an SP of 0.0125. What conclusions can you draw from these results?

[4]