

Exercise Sheet 8 - Lecture 8

- The following table gives the observed counts in 1-second intervals of alpha particles emitted from a radioactive source. Use a Chi-squared test at the 5% level to assess the goodness of fit to the Poisson distribution.

n	Observed
0	5267
1	4436
2	1800
3	534
4	111
5+	21

- Groups of six people are chosen at random and the number, x , of people in each group who normally wear glasses is recorded. The results obtained from 200 groups of six are shown in the table below. Fit a Binomial distribution to the data and assess the fit using a Chi-squared test at the 1% level..

x	0	1	2	3	4	5	6
Counts	17	53	65	45	18	2	0

- Over a period of time a mens' clothes shop sold 500 pairs of trousers. The numbers sold in various waist sizes were:

Waist (cm)	70	75	80	85	90	95	100	105	110
Frequency	5	13	37	88	114	123	82	29	9

Estimate the mean and standard deviation of the waist measurements, and test whether the figures support the theory that waist measurements follow a normal distribution. Use a 5% level of significance. (Note that a customer with, for example, a waist measurement between 80 and 85cm requires trousers with an 85cm waistband.)

- It is conventional wisdom in military squadrons that pilots tend to father more girls than boys. Snyder (1961) gathered data for military fighter pilots. The sex of the pilots offspring were tabulated for three kinds of flight duty during the month of conception, as shown in the following table. Is there any evidence of an association between father's activity and offspring gender? Use a 5% level of significance.

	Female Offspring	Male Offspring
Flying Fighters	51	38
Flying Transports	14	16
Not Flying	38	46

5. Grades in a statistics class were classified by students main subject of study. Is there any relationship between grade and major? Use a 1% level of significance.

Grade	Major		
	Psychology	Biology	Other
A	8	15	13
B	14	19	15
C	15	4	7
D-F	3	1	4

Exam Paper Questions The table below lists past exam paper *question numbers* that involve Chi-squared tests (useful for revision). NB. bracketed question numbers indicate that only part of the question involves Chi-squared tests.

Year	Human Sciences	Psychology		
	TT	MT	HT	TT
2001	3 7		2 3	3 7
2000	3 4 8	2 8	3 4	3 4 8
1999	3 7	3 7	(4) 10	3 7
1998	3 6		3 6	3 6
1997	5 7		3 7	5 7