

Statistics 2

Samples and hypothesis testing

Section 2: Contingency tables

Solutions to Exercise 3C

- 8 (i) H_0 : there is no association between type of member and primary reason
 H_1 : there is an association between type of member and primary reason

Observed frequencies

	IC	OC	G	SF	TOTAL
I	42	11	46	7	106
F	99	20	82	21	222
B	27	3	22	16	68
TOTAL	168	34	150	44	396

Expected frequencies

	IC	OC	G	S.F.	TOTAL
I	44.970	9.101	40.152	11.778	106
F	94.192	19.061	84.091	24.667	222
B	28.848	5.838	25.758	7.556	68
TOTAL	168	34	150	44	396

Contribution to χ^2

0.1961	0.3962	0.8519	1.9382
0.2465	0.0463	0.0520	0.5450
0.1184	1.3800	0.5482	9.4379

$$\text{so } \chi^2 = 15.76$$

Degrees of freedom $v = (3-1)(4-1) = 6$

For $2\frac{1}{2}\%$ significance level the critical value is 14.45.

As $15.76 > 14.45$ the result is significant, so reject H_0 , that is, there is an association between type of member and primary reason.

- (ii) The main feature is that business members are much more interested in the social facilities than would have been expected if there were no association.