

# STAT 571, Solution for Assignment #12

December 8, 2003

1.  $H_o : P_M = P_T = P_W = P_R = P_F = P_{Sa} = P_{Sn} = 1/7$   
 $H_A : \text{Not } H_o.$

Observed values:

Saturday	Sunday	Mon-Fri
87	67	246

Expected values:

Saturday	Sunday	Mon-Fri
57.143	57.143	285.714

$$\begin{aligned} \chi^2 &= \sum_{\text{all obs}} \frac{(\text{observed} - \text{expected})^2}{\text{expected}} \\ &= 22.82 \end{aligned}$$

Compared it with  $\chi_2^2$  distribution, we get p-value < 0.001. We have very strong evidence to reject  $H_o$ .

2.  $H_o : P_A = P_B = P_C = p$   
 $H_A : \text{Not } H_o.$

Since p is unknown, we estimate it by

$$\hat{p} = \frac{19 + 44 + 27}{48 + 85 + 70} = 0.44335.$$

Observed values:

AS	AF	BS	BF	CS	CF
19	29	44	41	27	43

Expected values:

AS	AF	BS	BF	CS	CF
21.28	26.72	37.68	47.32	31.03	38.97

$$\begin{aligned}\chi^2 &= \sum_{all\,obs} \frac{(observed - expected)^2}{expected} \\ &= 3.283\end{aligned}$$

Compared it with  $\chi^2_2$  distribution, we get p-value  $> 0.25$ . We have no evidence to reject  $H_0$ .