

# STAT100 Elementary Statistics and Probability Summer II 2014

Quiz 12, Thursday, August 21, 2014

Name: Jeff

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. You are allowed to calculator for basic calculation in this quiz. You have 20 minutes to take this 10 point quiz.

The following table shows the final grades for STAT 100 summer course.

	A	B	C or lower	Total
Summer I	11	13	20	44
Summer II	14	18	24	56
Total	25	31	44	100

1. (5 points) For the following model: 30% A, 30% B, 40% C or lower, test the goodness of fit with Summer I data. Test with  $\alpha = .05$ . (Use ONLY Summer I data to answer this question.)

	A	B	C or lower	
Observation	11	13	20	44
Estimation	13.2	13.2	17.6	44
$\frac{(O-E)^2}{E}$	.3667	.030	.3273	$\chi^2 = .6970$ d.f. = 2

$$H_0: P_A = 30\%, P_B = 30\%, P_C = 40\%$$

$$\text{Test statistic } \chi^2 \text{ d.f.} = 2$$

$$\text{Reject } H_0 \text{ if } \chi^2 \geq \chi^2_{\alpha}$$

Look up the cut off  $\chi^2_{.05} = 5.99$

As  $.6970 < 5.99$ , we retain  $H_0$ . Conclusion: data does not contradict the model.

2. (5 points) Do the data provide strong evidence that the point distribution of Summer I and Summer II are different? Test with  $\alpha = .05$ .

	A	B	C or lower	total
Summer I	11 (11)	13 (13.64)	20 (19.36)	44
Summer II	14 (14)	18 (17.36)	24 (24.64)	56
total	25	31	44	100

$\frac{(O-E)^2}{E}$	A	B	C
S.I	0	.030	.021
S.II	0	.024	.017
			$\chi^2 = .092$ d.f. = 2

Test on homogeneity. Cut off  $\chi^2_{\alpha} = 5.99$

As  $.092 < 5.99$ , we retain  $H_0$ . Conclusion: the point distributions are NOT significantly different.