

Practice Quiz 11

Statistics 90-707

Fall 2021

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1. (6 pts.) Some shoppers were observed in supermarket bakery departments that provided tongs and others were observed in departments that provided tissues. A researcher recorded how many people used their hands to withdraw baked goods instead of the tongs or tissues provided:

	Hands	No Hands	Total
Tongs	97	11	108
Tissues	83	49	132
Total	180	60	240

- (a) Which *two* of these are correct formulations of the null hypothesis?
- Use of hands, and whether tongs or tissues are provided, are not related.
 - Use of hands, and whether tongs or tissues are provided, are related.
 - Proportions who use their hands are the same for all shoppers in stores that provide tongs and stores that provide tissues.
 - Proportions who use their hands are different for all shoppers in stores that provide tongs and stores that provide tissues.
- (b) Calculate the relevant sample proportions: _____ and _____; which one of these do they support? (i) tongs are perceived as ineffective more than tissues, so more people resort to hands over tongs (ii) tissues are perceived as ineffective more than tongs, so more people resort to hands over tissues
- (c) If proportions using their hands were actually equal for shoppers in stores providing tongs and tissues, then the proportions would both be _____.
- (d) Complete this table of counts expected under the null hypothesis.

	Hands	No Hands	Total
Tongs			108
Tissues			132
Total	180	60	240

- (e) Calculate the chi-square statistic; its size is
(i) large (ii) not large (iii) borderline
- (f) The P -value is (i) small (ii) not small (iii) borderline
- (g) Draw your conclusions, first in terms of a relationship, then in terms of population proportions using their hands.

2. (4 pts.) Salary (in millions) was regressed on batting average for a sample of 6 baseball players in 2004.

The regression equation is

$$\text{Salary} = -28.9 + 122 \text{ BattingAverage}$$

Predictor	Coef	SE Coef	T	P
Constant	-28.947	8.700	-3.33	0.029
BattingA	121.55	30.32	4.01	0.016
S = 1.574 R-Sq = 80.1% R-Sq(adj) = 75.1%				

- (a) Explain why it makes sense for the relationship to be positive.
- (b) The P -value and the value of R-Sq together tell us that there is
- weak evidence of a weak relationship between batting average and salary
 - weak evidence of a strong relationship between batting average and salary
 - strong evidence of a weak relationship between batting average and salary
 - strong evidence of a strong relationship between batting average and salary
- (c) We seek evidence regarding the slope of the regression line for the
- sample of 6 players
 - population of all players
- (d) Inference for regression leads us to conclude that the slope
- may equal zero
 - equals zero
 - does not equal zero
- (e) Would a confidence interval for the slope contain zero? (Answer yes or no.)