

CATEGORICAL DATA ANALYSIS, 3rd edition

Solutions to Selected Exercises

Alan Agresti

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This file contains solutions and hints to solutions for some of the exercises in *Categorical Data Analysis*, third edition, by Alan Agresti (John Wiley, & Sons, 2012). The solutions given are partly those that are also available at the website www.stat.ufl.edu/~aa/cda2/cda.html for many of the odd-numbered exercises in the second edition of the book (some of which are now even-numbered). I intend to expand the document with additional solutions, when I have time.

Please report errors in these solutions to the author (Department of Statistics, University of Florida, Gainesville, Florida 32611-8545, e-mail AA@STAT.UFL.EDU), so they can be corrected in future revisions of this site. The author regrets that he cannot provide students with more detailed solutions or with solutions of other exercises not in this file.

Chapter 1

1. a. nominal, b. ordinal, c. interval, d. nominal, e. ordinal, f. nominal.
3. π varies from batch to batch, so the counts come from a mixture of binomials rather than a single $\text{bin}(n, \pi)$. $\text{Var}(Y) = E[\text{Var}(Y \mid \pi)] + \text{Var}[E(Y \mid \pi)] > E[\text{Var}(Y \mid \pi)] = E[n\pi(1 - \pi)]$.
7. a. $\ell(\pi) = \pi^{20}$, so it is not close to quadratic.
 b. $\hat{\pi} = 1.0$. Wald statistic $z = (1.0 - .5) / \sqrt{1.0(0)/20} = \infty$. Wald CI is $1.0 \pm 1.96\sqrt{1.0(0)/20} = 1.0 \pm 0.0$, or $(1.0, 1.0)$. These are not sensible.
 c. $z = (1.0 - .5) / \sqrt{.5(.5)/20} = 4.47$, $P < 0.0001$. Score CI is $(0.839, 1.000)$.
 d. Test statistic $2(20) \log(20/10) = 27.7$, $df = 1$. The CI is $(\exp(-1.96^2/40), 1) = (0.908, 1.0)$.
 e. $P\text{-value} = 2(.5)^{20} = .00000191$.
9. The chi-squared goodness-of-fit test of the null hypothesis that the binomial proportions equal $(0.75, 0.25)$ has expected frequencies $(827.25, 275.75)$, and $X^2 = 3.46$ based on $df = 1$. The P -value is 0.063, giving moderate evidence against the null.
10. The sample mean is 0.61. Fitted probabilities for the truncated distribution are 0.543, 0.332, 0.102, 0.021, 0.003. The estimated expected frequencies are 108.5, 66.4, 20.3, 4.1, and 0.6, and the Pearson $X^2 = 0.7$ with $df = 3$ (0.3 with $df = 2$ if we truncate at 3 and above). The fit seems adequate.
11. With the binomial test the smallest possible P -value, from $y = 0$ or $y = 5$, is

An Introduction To Categorical Data Analysis Solution

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Categorical Data Analysis Alan Agresti, 2013-04-08 Praise for the Second Edition: A must-have book for anyone expecting to do research and/or applications in categorical data analysis. *Statistics in Medicine*: It is a total delight reading this book. *Pharmaceutical Research*: If you do any analysis of categorical data, this is an essential desktop reference. *Technometrics*: The use of statistical methods for analyzing categorical data has increased dramatically, particularly in the biomedical, social sciences, and financial industries. Responding to new developments, this book offers a comprehensive treatment of the most important methods for categorical data analysis. *Categorical Data Analysis* Third Edition summarizes the latest methods for univariate and correlated multivariate categorical responses. Readers will find a unified generalized linear models approach that connects logistic regression and Poisson and

negative binomial loglinear models for discrete data with normal regression for continuous data This edition also features An emphasis on logistic and probit regression methods for binary ordinal and nominal responses for independent observations and for clustered data with marginal models and random effects models Two new chapters on alternative methods for binary response data including smoothing and regularization methods classification methods such as linear discriminant analysis and classification trees and cluster analysis New sections introducing the Bayesian approach for methods in that chapter More than 100 analyses of data sets and over 600 exercises Notes at the end of each chapter that provide references to recent research and topics not covered in the text linked to a bibliography of more than 1 200 sources A supplementary website showing how to use R and SAS for all examples in the text with information also about SPSS and Stata and with exercise solutions

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[Student Solutions Manual for Introductory Statistics](#) Stephen Kokoska, 2010-01-26 This Guide offers students explanations of crucial concepts in each section of IPS plus detailed solutions to key text problems and stepped through models of important statistical techniques

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[Mathematical Statistics](#) Peter J. Bickel, Kjell A. Doksum, 2015-03-25 Mathematical Statistics Basic Ideas and Selected Topics Volume I Second Edition presents fundamental classical statistical concepts at the doctorate level It covers estimation prediction testing confidence sets Bayesian analysis and the general approach of decision theory This edition gives careful proofs of major results and explains ho

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(Snedecor and Cochran, 1989) is used to determine if two population means are equal. 2 Sample t-Test (1 tailed) Suppose we have two samples of ceramic sherd thickness collected from an archaeological site, where the two samples are easily distinguishable by the use of. Two sample t-test: SAS instruction Note that the test is two-sided (sides=2), the significance level is 0.05, and the test is to compare the difference between two means ($\mu_1 - \mu_2$) against 0 ($H_0 \dots$