

STAT 579: Discrete Multivariate Analysis

Course Description: Models for discrete data; two dimensional and higher dimensional tables; categorical data analysis; chi-square goodness of fit tests; maximum likelihood estimation of parameters.

Prerequisite: STAT 480a,b

Textbook: *Categorical Data Analysis* by Alan Agresti

Topics

Chapter 1 Introduction

Chapter 2 Describing Two-Way Contingency Tables

- 2.1 Table Structure for Two Dimensions
- 2.2 Ways of Comparing Proportions
- 2.3 Summary Measures of Association

Chapter 3 Inference for Two-Way Contingency Tables

- 3.1 Sampling Distributions
- 3.2 Testing Goodness of Fit
- 3.3 Testing Independence
- 3.4 Large-Sample Confidence Intervals
- 3.5 Exact Tests for Small Samples
- 3.6 Exact Non-Null Inference

Chapter 4 Models for Binary Response Variables

- 4.1 Generalized Linear Models
- 4.2 Logistic Regression
- 4.3 Logit Models for Categorical Data
- 4.4 Using Models to Improve Value Models
- 4.5 Probit and Extreme Value Models
- 4.7 Fitting Logit Models

Chapter 5 Loglinear Models

- 5.1 Loglinear Model for Two Dimensions
- 5.2 Table Structure for Three Dimensions
- 5.3 Loglinear Models for Three Dimensions

Chapter 6 Fitting Loglinear and Logit Models

- 6.1 Sufficiency and Likelihood for Loglinear Models
- 6.2 Estimating Expected Frequencies
- 6.3 Testing Goodness of Fit
- 6.4 Estimating Model Parameters