Exam 2 Study Guide
MATH 166 - Spring 2023
Tufts University, Department of Mathematics
Instructor: James M. Murphy

- **Inference for Multinomial Distributions:** MLE for multinomials, asymptotic limits of multinomial distributions, χ^2 distributions, hypothesis testing for multinomial distributions.

- **Inference for Independence**: contingency tables, Pearson's χ^2 test for independence.

- **Linear Regression**: idea of linear regression, coefficient formulas and proofs of optimality, application and interpretation on data.

- **Density Estimation**: histogram estimation, kernel density estimation, optimal bin size/bandwidth and related bias-variance tradeoff.

The exam will consist of 3 questions, and will last for 75 minutes. It is closed book— no books, notes, or other any other outside resources are permitted. It is recommended to study the homework first, then the class notes, then the textbook.