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ADAPTIVE ALLOCATION FOR ESTIMATION

BY CONNIE PAGE

Michigan State University

Abstract

Consider I populations and suppose that the goal is estimation of some function of parameters from these populations. Furthermore, a fixed total number of observations can be taken, and the problem is to decide how to allocate this total among the I populations. Some general discussion of this problem is given, then the problem is specialized to dichotomous populations and estimating the product of success probabilities. A Bayesian approach is taken using a family of scaled squared error loss functions for estimation. The best nonrandom allocation and the myopic allocation are derived, and references for the optimal allocation are given. The myopic allocation suggests a simple adaptive rule that is appropriate for all losses in the scaled family, and the limiting properties of this adaptive rule are noted.

1. Introduction. Consider I populations, and suppose that the goal is estimation of some function of parameters from these I populations. A fixed number of observations can be taken, and the problem is to decide how many observations to take from each population or how to allocate the total number of observations available. Since the goal is estimation, the allocation decision is typically made to minimize the variance or Bayes risk of a selected estimator. An early example

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