Solution Manual to
A Course in Mathematical Statistics and Large Sample Theory

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Introduction

Ex. 1.1. From a population of size N a simple random sample of size n is drawn *without replacement*, and a real-valued characteristic X measured to yield observations X_j $(j = 1, 2, \ldots, n)$. Show that

(a) The way we deal

(b) the expected squared error of $\bar{X}$ as an estimator of m, i.e., the variance of $\bar{X}$, is smaller than that of the mean of a simple random sample of the same size n drawn *with replacement*, and

(c) the difference between the expected squared errors of the two estimators is $O(n/N)$, as n/N goes to zero.

CHAPTER 2

Decision Theory

Ex. 2.1. From a population of size N a simple random sample of size n is drawn *without replacement*, and a real-valued characteristic X measured to yield observations X_j $(j = 1, 2, \ldots, n)$. Show that

(a) The way we deal

(b) the expected squared error of $\bar{X}$ as an estimator of m, i.e., the variance of $\bar{X}$, is smaller than that of the mean of a simple random sample of the same size n drawn *with replacement*, and

(c) the difference between the expected squared errors of the two estimators is $O(n/N)$, as n/N goes to zero.

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Ex. 3.1. From a population of size N a simple random sample of size n is drawn *without replacement*, and a real-valued characteristic X measured to yield observations X_j $(j = 1, 2, \ldots, n)$. Show that

(a) The way we deal

(b) the expected squared error of $\bar{X}$ as an estimator of m, i.e., the variance of $\bar{X}$, is smaller than that of the mean of a simple random sample of the same size n drawn *with replacement*, and

(c) the difference between the expected squared errors of the two estimators is $O(n/N)$, as n/N goes to zero.

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Ex. 4.1. From a population of size N a simple random sample of size n is drawn *without replacement*, and a real-valued characteristic X measured to yield observations X_j $(j = 1, 2, \ldots, n)$. Show that

(a) The way we deal

(b) the expected squared error of $\bar{X}$ as an estimator of m, i.e., the variance of $\bar{X}$, is smaller than that of the mean of a simple random sample of the same size n drawn *with replacement*, and

(c) the difference between the expected squared errors of the two estimators is $O(n/N)$, as n/N goes to zero.

CHAPTER 5

Testing Hypotheses

Ex. 5.1. From a population of size N a simple random sample of size n is drawn *without replacement*, and a real-valued characteristic X measured to yield observations X_j $(j = 1, 2, \ldots, n)$. Show that

(a) The way we deal

(b) the expected squared error of $\bar{X}$ as an estimator of m, i.e., the variance of $\bar{X}$, is smaller than that of the mean of a simple random sample of the same size n drawn *with replacement*, and

(c) the difference between the expected squared errors of the two estimators is $O(n/N)$, as n/N goes to zero.

CHAPTER 6

Consistency and Asymptotic Distributions of Statistics

Ex. 6.1. **ERRATA**

(a)

(b) errata cascades

Ex. 6.2. (a)

(b) errata cascades