EoS - E-tutorial 06 - WiSe 2022/2023

StatRef.G.2.1.00010 (60 Punkte)

Sie haben die folgende Antwort gegeben:

You are looking at 6 stochastically independent and identically normally distributed random variables $X_1, \ldots, X_6$. You want to estimate the expected value of the population. To this end, you are provided with the following estimating function U:

$U = \frac{1}{5}(2X_3 + 7X_2 + 9X_6 - 10X_1)$

Hint: Please round your results - if necessary and if not asked otherwise - to **four** decimal places.

a) (20 Points) The expected value of the estimating function U is $E(U) =$ 1.6 ✓ μ.

b) (25 Points) The variance of the estimating function U is $Var(U) =$ 9.36 ✓ σ^2.

c) (10 Points) The estimating function $\bar{X} = \frac{1}{n}\sum_{i=1}^{n} X_i$ is an unbiased estimator for the expected value of a population characteristic. Please calculate the variance of this estimator in the case of $n = 3$. The variance of the estimator $\bar{X}$ is $Var(\bar{X}) =$ 1 ✗ σ^2.

d) (5 Punkte) To which of the following statements do you agree? The bias of an unbiased estimating function U is always $Bias(U) = 0$. ✓

Die bestmögliche Lösung lautet:

You are looking at 6 stochastically independent and identically normally distributed random variables $X_1, \ldots, X_6$. You want to estimate the expected value of the population. To this end, you are provided with the following estimating function U:

$U = \frac{1}{5}(2X_3 + 7X_2 + 9X_6 - 10X_1)$

Hint: Please round your results - if necessary and if not asked otherwise - to **four** decimal places.

a) (20 Points) The expected value of the estimating function U is $E(U) =$ 1.6 μ.

b) (25 Points) The variance of the estimating function U is $Var(U) =$ 9.36 σ^2.

c) (10 Points) The estimating function $\bar{X} = \frac{1}{n}\sum_{i=1}^{n} X_i$ is an unbiased estimator for the expected value of a population characteristic. Please calculate the variance of this estimator in the case of $n = 3$. The variance of the estimator $\bar{X}$ is $Var(\bar{X}) =$ 0.333333333333333 σ^2.

d) (5 Punkte) To which of the following statements do you agree? The bias of an unbiased estimating function U is always $Bias(U) = 0$.

Sie haben 50 von 60 möglichen Punkten erreicht.