

EoS - E-tutorial 05 - WiSe 2022/2023


StatRef.G.2.1.00038 (60 Punkte)

Sie haben die folgende Antwort gegeben:

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

$$U = \frac{1}{2} \sum_{i=1}^4 X_i + 4X_6$$

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 $E(U) = 6 \checkmark \mu$.
- b) (25 Points) The variance of the estimating function U is $Var(U) = 17 \checkmark \sigma^2$.
- 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 $n = 4$. The variance of the estimator \bar{X} is $Var(\bar{X}) = 0.25 \checkmark \sigma^2$.
- d) (5 Punkte) To which of the following statements do you agree? Unbiased estimators are always to be preferred to biased estimators. 

Die bestmögliche Lösung lautet:

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

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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 $E(U) = 6 \mu$.
- b) (25 Points) The variance of the estimating function U is $Var(U) = 17 \sigma^2$.
- 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 $n = 4$. The variance of the estimator \bar{X} is $Var(\bar{X}) = 0.25 \sigma^2$.
- d) (5 Punkte) To which of the following statements do you agree? The bias of an estimating function U which is not unbiased is always distinct from zero.

Sie haben 55 von 60 möglichen Punkten erreicht.