

EoS - E-tutorial 06 - WiSe 2022/2023

StatRef.G.1.1.00022 (60 Punkte)






Sie haben die folgende Antwort gegeben:

From a population with an unknown distribution and $N = 1200$ elements a sample of size $n = 66$ is drawn. The following results for the variable of interest X have been reached:

$$\sum_{i=1}^{66} x_i = 19419 \quad \sum_{i=1}^{66} (x_i - \bar{x})^2 = 1151235.59$$

Hint: Please round your results - if necessary and if not asked otherwise - to **four** decimal places. Please use - if not asked otherwise - sampling **without** replacement.

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- a) (10 Points) Please use an unbiased estimator to reach an estimate for the population total. 353072.7 
- b) (15 Points) Please calculate a variance estimator for the sample mean. 365479716 
- c) (15 Points) Please calculate the value of the upper bound of a two-sided 95 percent confidence interval for the sample mean. 402316.2 
- d) (15 Points) From another sample you know that $\bar{x} = 289.72$ and $s^2 = 266.41$. Please determine the minimal sample size needed to ensure a two-sided 90 percent confidence interval which is not longer than 6. Please assume sampling with replacement here. 81 
- e) (5 Points) To which of the following statements concerning interval estimation do you agree? A doubling of the sample size - all else being equal - leads to a halving of a confidence interval's length. 

Die bestmögliche Lösung lautet:

From a population with an unknown distribution and $N = 1200$ elements a sample of size $n = 66$ is drawn. The following results for the variable of interest X have been reached:

$$\sum_{i=1}^{66} x_i = 19419 \quad \sum_{i=1}^{66} (x_i - \bar{x})^2 = 1151235.59$$

Hint: Please round your results - if necessary and if not asked otherwise - to **four** decimal places. Please use - if not asked otherwise - sampling **without** replacement.

- a) (10 Points) Please use an unbiased estimator to reach an estimate for the population total. 353072.727272727
- b) (15 Points) Please calculate a variance estimator for the sample mean. 253.805358206431
- c) (15 Points) Please calculate the value of the upper bound of a two-sided 95 percent confidence interval for the sample mean. 325.451987810385
- d) (15 Points) From another sample you know that $\bar{x} = 289.72$ and $s^2 = 266.41$. Please determine the minimal sample size needed to ensure a two-sided 90 percent confidence interval which is not longer than 6. Please assume sampling with replacement here. 81

e) (5 Points) To which of the following statements concerning interval estimation do you agree? A decrease in the sample size leads to - all else being equal - an increase in the length of the confidence interval.

Sie haben 25 von 60 möglichen Punkten erreicht.