EoS - E-tutorial 06 - WiSe 2022/2023

StatRef.G.1.4.00007 (60 Punkte)

Sie haben die folgende Antwort gegeben:

In order to compare the average annual gross salaries among $N = 3900$ graduates of the two universities X and Y, respectively, a sample of $n = 160$ graduates each is conducted. For the subsequent analysis of the sample data, you are provided with the following sample values:

$\sum_{i=1}^{160} x_i = 6396000$ $\sum_{i=1}^{160} (x_i - \bar{x})^2 = 622097138$ $\sum_{i=1}^{160} y_i = 8032448$ $\sum_{i=1}^{160} (y_i - \bar{y})^2 = 601129632$

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

a) (15 Points) Please use an unbiased estimator to estimate the total of the annual gross salaries of the graduates of university Y. 195790920 ✓

b) (20 Points) Please calculate the upper bound of a two-sided 95 percent confidence interval for the average annual gross salary of the graduates of university X. 40281.49 ✓

c) (5 Points) Describe how the length of the confidence interval of part b) would change if the sample size was 40 instead of 160 - all else being equal. The length of the confidence interval becomes four times shorter. ✗

d) (20 Points) You assume that the salaries differ significantly across the two universities. Test the hypothesis that the difference between the average annual gross salary of university **X** and that of university **Y** is significantly smaller than -11000. Please calculate the test statistic corresponding to your hypothesis.
Please note: The variances of the two samples are unequal! 3.5216 ✓

Die bestmögliche Lösung lautet:

In order to compare the average annual gross salaries among $N = 3900$ graduates of the two universities X and Y, respectively, a sample of $n = 160$ graduates each is conducted. For the subsequent analysis of the sample data, you are provided with the following sample values:

$\sum_{i=1}^{160} x_i = 6396000$ $\sum_{i=1}^{160} (x_i - \bar{x})^2 = 622097138$ $\sum_{i=1}^{160} y_i = 8032448$ $\sum_{i=1}^{160} (y_i - \bar{y})^2 = 601129632$

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

a) (15 Points) Please use an unbiased estimator to estimate the total of the annual gross salaries of the graduates of university Y. 195790920

b) (20 Points) Please calculate the upper bound of a two-sided 95 percent confidence interval for the average annual gross salary of the graduates of university X. 40281.4916443721

c) (5 Points) Describe how the length of the confidence interval of part b) would change if the sample size was 40 instead of 160 - all else being equal. The length of the confidence interval doubles.

d) (20 Points) You assume that the salaries differ significantly across the two universities. Test the hypothesis that the difference between the average annual gross salary of university **X** and that of university **Y** is significantly smaller than -11000. Please calculate the test statistic corresponding to your hypothesis.

Please note: The variances of the two samples are unequal!

3.52155813542483

Sie haben 55 von 60 möglichen Punkten erreicht.