Questions: Introduction to confidence intervals

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Summary

A selection of questions to test your understanding of confidence intervals using the normal distribution.

Before attempting these questions it is highly recommended that you read Guide: Introduction to confidence intervals.

Q1

Identify the confidence level from these α values.

1.1. $\alpha = 0.05$

1.2. $\alpha = 0.1$

1.3. $\alpha = 0.07$

Q2

Using the normal distribution, what are the Z-values for these alpha values? You may find Calculator: Z-score helpful.

2.1. $\alpha = 0.05$

2.2. $\alpha = 0.1$

2.3. $\alpha = 0.07$

Q3

Cantor's Confectionery want to calculate a 99% confidence interval for the weight of 178 chocolate swirls. The average weight of this sample is $14\,\mathrm{g}$ and the standard deviation is $0.75\,\mathrm{g}$.

3.1. Identify the following:

- sample size n
- sample mean $\bar{x}$
- sample standard deviation s
- alpha value α
- Z-value $Z_{\alpha/2}$

3.2. Use the information in 3.1 to construct a 99% confidence interval for the weight of Cantor's Confectionery's chocolate swirls. Give your answers to 3 decimal places.

3.3. Explain what the confidence interval tells you.

Q4

You are given the following data.

Quantity	Value
s	4
$\bar{x}$	31
n	59

Use the summary table below to construct the following:

4.1. a 90% CI.

4.2. a 95% CI.

4.3. a 99% CI.

You should give you answers to 2 decimal places.

Q5

You are given a 90% CI as $[98.1, 102.5]$ with a sample size of 121. Work out an estimate of the sample mean $\bar{x}$ and sample standard deviation s associated to this confidence interval. Explain why this can only be an estimate.

After attempting the questions above, please click this link to find the answers.

Version history and licensing

v1.0: initial version created 12/25 by Millie Harris as part of a University of St Andrews VIP project.