Statistics for laboratory scientists

Solutions for the homework problems for lecture 13

1. **No**. The correct statement would be something like, "95% of such confidence intervals would contain the population mean."

2. The confidence interval would be

   xbar ± 1.96 × sigma / sqrt{n}

   with width 2 × 1.96 × sigma / sqrt{n}.

   Thus we need to solve the following for n:

   2 × 1.96 × 1.5 / sqrt{n} = 1

   Thus n = $(2 \times 1.96 \times 1.5)^2$ = 34.6.

   Thus we need to measure **at least 35 samples**. This is too large! We should get a more precise measuring device.

3. Sample mean = 3.496; sample SD = 0.301. The appropriate t-value (in R, use `qt(0.975, 4)`) is 2.776.

   Thus the 95% confidence interval is 3.496 ± 2.776 × 0.301 / sqrt{5} = (approx) **3.50 ± 0.37** = (approx) **(3.12, 3.87)**.

[3rd term syllabus | 4rd term syllabus | R for Windows]

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