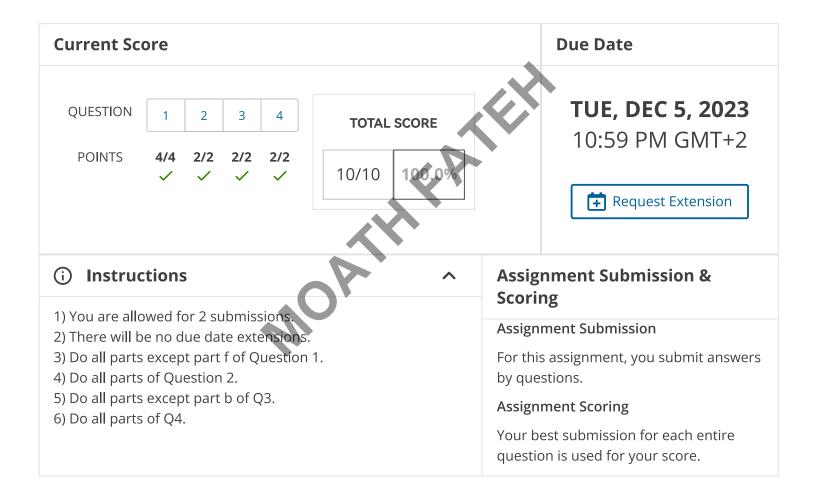
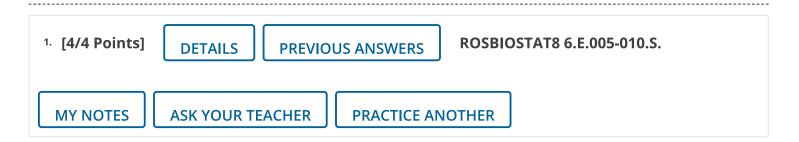


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Assignment 6.1 (Homework)





Pulmonary Disease

The data in the table below concern the mean triceps skin-fold thickness in a group of normal men and a group of men with chronic airflow limitation.

| Group | Mean | sd | n |
|----------------------------|------|------|----|
| Normal | 1.31 | 0.56 | 40 |
| Chronic airflow limitation | 0.97 | 0.47 | 32 |

You can use the Distribution Calculators page in SALT to find percentiles to answer parts of this question.

(a) What is the standard error of the mean for the normal group? (Round your answer to four decimal places.)

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0.0885
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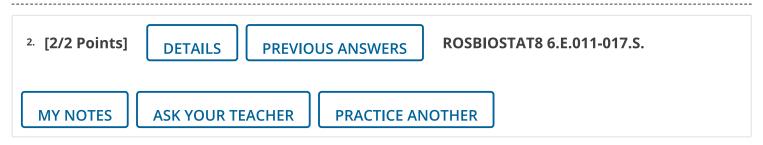
What is the standard error of the mean for the chronic airflow limitation group? (Round your answer to four decimal places.)

0.0831

(b) Assume that the central-limit theorem is applicable. What does it mean in this context? (Round your answers to four decimal places.)

It means that the distribution of mean triceps skin-fold thickness from repeated samples of size 40 drawn from the population of normal men can be considered to be normal \checkmark with mean = 1.3100 \checkmark and variance = 0.0078 \checkmark . It also means that the distribution of mean triceps skin-fold thickness from repeated samples of size 32 drawn from the population of men with chronic airflow limitation can be considered to be normal \checkmark with mean = 0.9700 \checkmark and variance = 0.0069 \checkmark .

- (c) Find the upper 1st percentile of a *t* distribution with 17 *df*. (Round your answer to two decimal places.) $\boxed{2.57}$
- (d) Find the lower 10th percentile of a *t* distribution with 27 *df*. (Round your answer to two decimal places.) $[-1.31] \checkmark$
- (e) Find the upper 2.5th percentile of a *t* distribution with 8 *df*. (Round your answer to two decimal places.) $\boxed{2.31}$



The data in the following table are a sample from a larger data set collected on people discharged from a selected Pennsylvania hospital as part of a retrospective chart review of antibiotic usage in hospitals. Regard this hospital as typical of Pennsylvania hospitals.

Data Table

| Id | Duration of Hospital Stay | Age | Sex | First Temperature Following Admission | First WBC (× 1,000) Following Admission | Received Antibiotic | Received Bacterial Culture | Service |
|----|------------------------------------|-----|--------|--|--|------------------------|----------------------------------|---------|
| 1 | 5 | 30 | Female | 99 | 7 | No | No | Medical |
| 2 | 10 | 73 | Female | 98 | 4 | No | Yes | Medical |
| 3 | 6 | 40 | Female | 99 | 11 | No | No | Surgery |
| 4 | 11 | 47 | Female | 98.2 | 3 | No | No | Surgery |
| 5 | 5 | 25 | Female | 98.5 | 12 | No | No | Surgery |
| 6 | 14 | 82 | Male | 96.8 | 5 | Yes | No | Surgery |
| 7 | 30 | 60 | Male | 99.5 | 9 | Yes | Yes | Medical |
| 8 | 11 | 56 | Female | 98.6 | 8 | No | No | Medical |
| 9 | 17 | 43 | Female | 98 | 6 | No | No | Medical |
| 10 | 3 | 50 | Male | 98 | 11 | No | Yes | Surgery |
| 11 | 9 | 59 | Female | 97.6 | 8 | No | Yes | Medical |
| 12 | 3 | 4 | Male | 97.8 | 2 | No | No | Surgery |
| 13 | 8 | 22 | Female | 99.5 | 10 | Yes | No | Surgery |
| 14 | 8 | 33 | Female | 98.4 | 13 | Yes | Yes | Surgery |
| 15 | 5 | 20 | Male | 98.4 | 10 | No | Yes | Surgery |
| 16 | 5 | 32 | Male | 99 | 10 | No | No | Surgery |
| | | | | | | | | |

| 17 | 7 | 36 | Male | 99.2 | 7 | Yes | No | Surgery |
|----|----|----|--------|------|----|-----|----|---------|
| 18 | 4 | 69 | Male | 98 | 7 | No | No | Surgery |
| 19 | 3 | 47 | Male | 97 | 6 | Yes | No | Medical |
| 20 | 7 | 22 | Male | 98.2 | 5 | No | No | Surgery |
| 21 | 9 | 11 | Male | 98.2 | 9 | No | No | Surgery |
| 22 | 11 | 19 | Male | 98.6 | 13 | Yes | No | Surgery |
| 23 | 11 | 67 | Female | 97.6 | 5 | No | No | Medical |
| 24 | 9 | 43 | Female | 98.6 | 6 | No | No | Surgery |
| 25 | 4 | 41 | Female | 98 | 6 | No | No | Medical |

L USE SALT

(a) Compute a 95% CI for the mean age (in years). (Enter your answer using interval notation. Round your numerical values to two decimal places.)

\$\$(32.94,49.54)

🛷 years

(b) Compute a 95% CI for the mean white blood count (in thousands) (use the variable named "First WBC (x 1000) following admission") following admission. (Enter your answer using interval notation. Round your numerical values to two decimal places.)

\$\$(6.47,8.97)

thousands

(c) Compute a 90% CI for the mean white blood count (in thousands) (use the variable named "First WBC (x 1000) following admission") following admission. (Enter your answer using interval notation. Round your numerical values to two decimal places.)

| \$\$(| 6.69,8.75) | |
|-------|------------|--|
| | | |
| | | |
| | thousands | |

(d) What is the relationship between your answers to (b) and (c)?

The 90% confidence interval is narrower than the 95% confidence interval since we are requiring more confidence.
 The 90% confidence interval is narrower than the 95% confidence interval since we are requiring less confidence.

The 90% confidence interval is wider than the 95% confidence interval since we are requiring more confidence.

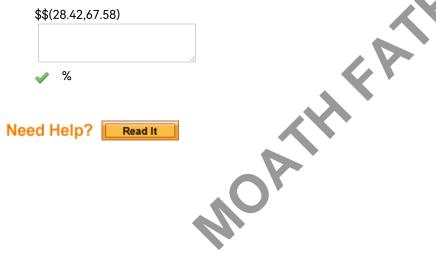
The 90% confidence interval is wider than the 95% confidence interval since we are requiring less confidence.

 \checkmark

- (e) What is the best point estimate of the percentage of males among patients discharged from Pennsylvania hospitals?
 48
 %
- (f) What is the standard error of the estimate of the percentage of males among patients discharged from Pennsylvania hospitals? (Round your answer to four decimal places.)



(g) Provide a 95% CI for the percentage of males among patients discharged from Pennsylvania hospitals. (Enter your answer using interval notation. Round your numerical values to two decimal places.)



| ^{3.} [2/2 Points] | DETAILS | PREVIOUS ANS | WERS | ROSBIOSTAT8 6.E.030-032.S. |
|----------------------------|-------------|--------------|----------|----------------------------|
| MY NOTES | ASK YOUR TE | ACHER | TICE ANO | IOTHER |

Pharmacology

Suppose we want to estimate the concentration (μ g/mL) of a specific dose of ampicillin in the urine after various periods of time. We recruit 23 volunteers who have received ampicillin and find they have a mean concentration of 6.0 μ g/mL with a standard deviation of 2.0 μ g/mL. Assume the underlying population distribution of concentrations is normally distributed.

You can use \langle SALT \rangle to answer parts of this question.

(a) Find a 95% CI for the population mean concentration (in μg/mL). (Enter your answer using interval notation. Round your numerical values to two decimal places.)

| | (5.14,6.86) | |
|---------|-------------|----|
| ✓ μg/mL | | XA |
| | MOA | |

(c) What is the minimum sample size that would be needed to ensure that the length of the CI in part (a) is 0.5 µg/mL assuming the sample standard deviation remains at 2.0 µg/mL?





| 4. [2/2 Points] | DETAILS | PREVIOUS ANSWERS | ROSBIOSTAT8 6.E.027-029.S. |
|-----------------|-------------|-------------------|----------------------------|
| 2/2 Submissions | Used | | |
| MY NOTES | ASK YOUR TE | EACHER PRACTICE A | NOTHER |

Sexually Transmitted Disease

Suppose a clinical trial is conducted to test the efficacy of a new drug, spectinomycin, for treating gonorrhea in females. Sixtyfour patients are given a 4-g daily dose of the drug and are seen 1 week later, at which time 8 of the patients still have gonorrhea.



(a) What is the best point estimate for p, the probability of a failure with the drug?

| <i>p̂</i> = 0.125 | \checkmark |
|-------------------|--------------|
|-------------------|--------------|

(b) What is a 95% CI for p? (Enter your answer using interval notation. Round your numerical values to three decimal places.)
 \$\$(0.044,0.206)



(c) Suppose we know penicillin G at a daily dose of 4.8 megaunits has a 10% failure rate. What can be said in comparing the two drugs?

Since the 10% failure rate for penicillin is within
the bounds of the 95% CI, we can conclude that it is plausible that spectinomycin is equally
effective than penicillin G.

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