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Lab

Single Sample t-test



SPEAKER: MICHAEL J. MAHOMETA, Ph.D.

The easiest transition into the use of the t-distribution

is to look at it with an example.

Now we already know the idea of the z-test, and the use of the normal distribution.

▶ 0:00 / 8:22

▶ 1.0x



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Comprehension Check

1. A necessary condition for a one-sample t-test is that the sample must consist of "independent" observations. What does this mean?

(1/1 point)

Lab due May 03, 2016
at 17:00 UTC

Problem Set

Problem Set due May
03, 2016 at 17:00 UTC

☐ The data must have been collected by an objective, non-biased investigator.

☒ There must be no predictable relationship between one subject's score and any other subject's score. ✓

☐ The subjects in the study must be individuals that don't know each other.

☐ The sample cannot have come from the population that is under investigation.

2. Researchers are interested in whether or not the average person consumes 2,000 calories per day. Their random sample of 25 people consumed an average of 1,891 calories, with a standard deviation of 251 calories.

(1/1 point)

2a. What is the t-statistic? (Round to 2 decimal places.)

-2.17

✓ Answer: -2.17

-2.17

(1/1 point)

2b. What is the **absolute** critical t value, assuming $\alpha = 0.05$?

☒ 2.064 ✓

☐ 2.060

☐ 1.708

☐ 1.960

(1/1 point)

2c. What should the researchers conclude?

☐ People consume 2,000 calories per day on average.

☐ People consume more than 2,000 calories per day on average.

☒ People do not consume an average of 2,000 calories per day. ✓

3. Scientists fear that polar bears are slowly starving due to their shrinking habitat. A healthy male polar bear weighs about 900 pounds. A new expedition was able to estimate the weight of 7 male polar bears. They found an average weight of 861 lbs with a standard deviation of 59 pounds.

(1/1 point)

3a. What is the alternative hypothesis for this test?

☒ $H_a : \mu < 900$ ✓

☐ $H_a : \mu > 900$

☐ $H_a : \mu = 900$

☐ $H_a : \mu \neq 900$

(1/1 point)

3b. How many degrees of freedom are there?

✓ Answer: 6

(1/1 point)

3c. What is the value of the standard error? (Round to 1 decimal place.)

✓ Answer: 22.3

(1/1 point)

3d. What is the t-statistic? (Round to 3 decimal places.)

✓ Answer: -1.749

\(\)

(1/1 point)

3e. What is the t-critical value, assuming $\alpha=0.05$?☒ -1.943 ✓☐ -1.895☐ -1.96☐ 1.943

(1/1 point)

3f. Do you reject the null hypothesis?

No



Answer: No

(1/1 point)

3g. What should the researchers conclude?

☐ The average weight of polar bears has dropped significantly.☒ There is no evidence that polar bears weigh less than 900 lbs on average. ☐ We must conclude the polar bears are slowly starving because the sample mean was less than the hypothesized mean.

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