

The Z Test

Assignment: Heiman Chapter 10

Terms You Should Know.

Z-test
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Critical Value of Z when $p < .05$
for a 1-tail test.
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Critical Value of Z when $p < .05$
for a 2-tail test.
.....

Critical value of Z when $p < .01$
for a 1-tail test
.....

Critical value of Z when $p < .01$
for a 2-tail test
.....

Formulas and Symbols You Should Know.

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$$\sigma_x = \frac{\sigma}{\sqrt{N}}$$
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$$\frac{\bar{X} - \mu}{\sigma_{\bar{X}}}$$
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Homework #9: Calculations You Should Master

Name: _____ (This is my work, and my work alone.)

1. The following three means came from a population with $\mu = 33$ and $\sigma = 8$. Do you think that the following sample means came from this population? Why or why not? Show your computations.

a. $\bar{X} = 39, S = 4, N = 36.$

b. $\bar{X} = 22, S = 12, N = 25.$

c. $\bar{X} = 35, S = 19, N = 16$

Problem 1. Dr. Sy Napse had the idea that intense intellectual effort would affect the level of blood cholesterol but did not know how much. The researcher had data from a huge group where $\mu = 150$ and $\sigma = 16$. A group of 36 heavy thinkers had a mean level of 156 with $s = 12$. Was Napse correct in this assumption?

1. What is your research hypothesis?
2. What is H_0 ?
3. What is H_A ?
4. Is this a one or two-tailed test?
5. What is your statistical hypothesis?
6. What is the significance level and its critical value of Z?
7. What is the Standard error of the mean?
8. What is your calculated statistic?
9. What is your statistical decision?
10. What is your conclusion?

Problem 2. Sammi Quaver thinks that listening to Barry Manilow music while studying will affect students' performance on the Graduate Record Examinations but does not know whether the listening will distract students making their studying less effective, or if it will improve studying by acting as 'white noise' blocking out other distracting sounds. The GRE has the following statistical properties: $\mu = 500$ and $\sigma = 100$. Using a sample of 121 students who listened to Barry Manilow while preparing for the GRE, the professor found that the group obtained a mean score of 460 with a standard deviation of 68.2. What conclusion can you draw from these data?

1. What is your research hypothesis?
2. What is H_0 ?
3. What is H_1 ?
4. Is this a one or two-tailed test?
5. What is your statistical hypothesis?
6. What is the significance level and its critical value of Z?
7. What is the Standard error of the mean?
8. What is your calculated statistic?
9. What is your statistical decision?
10. What is your conclusion?

Problem 3. Dr. Oh Takashowa thought that hot baths prior to bed time would reduce the amount of sleep people required. The researcher knew that the average number of hours required for most people is 8 hours; the standard deviation is .72 hours. Using a sample of 36 people who took hot baths before going to bed, the researcher found that the mean amount of time they needed to sleep each night was 7.7 hours. Is there any statistical evidence that the bathing worked?

1. What is Null Hypotheses H_0 ?
2. What is Alternative hypothesis, H_A ?
- 3 Is this a one or two-tailed test?
4. What is the statistical hypothesis?
5. What is the significance level and critical value or the test?
6. What is the standard error?
7. What is Z?
8. What is your statistical decision?
9. What is your conclusion?
