HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 1

A commonly cited standard for one-way length (duration) of school bus rides for elementary school children is 30 minutes. A local government office in a rural area randomly samples 100 elementary school children in their district and find an average one-way commute time of 38 minutes with a standard deviation of 8 minutes.

Which of the following is the correct set of hypotheses for testing if the average commute time of elementary school students in this district is different than the commonly cited standard of 30 minutes?

- $H_0: \mu = 30; H_A: x = 38$
- $H_0: x = 38; H_A: \mu = 30$
- $H_0: \mu = 30; H_A: \mu \neq 30$
- $H_A: \mu = 30; H_0: x \neq 30$
- $H_0: \mu = 30; H_A: \mu > 30$

Question Help: Video Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 2

A commonly cited standard for one-way length (duration) of school bus rides for elementary school children is 30 minutes.

A local government office in a rural area conducts a study to determine if elementary schoolers in their district have a longer average one-way commute time. If they determine that the average commute time of students in their district is significantly higher than the commonly cited standard they will invest in increasing the number of school busses to help shorten commute time. What would a Type 2 error mean in this context?

- The local government decides that the average commute time is 30 minutes.
- The local government decides that the data provide convincing evidence of an average commute time higher than 30 minutes, when the true average commute time is in fact 30 minutes.
- The local government decides that the data **do not** provide convincing evidence of an average commute time higher than 30 minutes, when the true average commute time is in fact higher than 30 minutes.
- The local government decides that the data **do not** provide convincing evidence of an average commute time different than 30 minutes, when the true average commute time is in fact 30 minutes.

Question Help: Video Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 3

Food inspectors inspect samples of food products to see if they are safe. This can be thought of as a hypothesis test with the following hypotheses.

H_0: the food is safe

H_a: the food is not safe

The following is an example of what type of error?

The sample suggests that the food is safe, but it actually is not safe.

- type I
- type II
- not an error

Question Help: Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 4

If your claim is in the null hypothesis and you reject the null hypothesis, then your conclusion would be:

- There is not sufficient sample evidence to support the original claim
- The sample data support the original claim
- There is sufficient evidence to warrant rejection of the original claim
- There is not sufficient evidence to warrant rejection of the original claim

Question Help: Video Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 5

A New York Times article titled *For Runners, Soft Ground Can Be Hard on the Body* considered two perspectives on whether runners should stick to hard surfaces or soft surfaces following an injury. One position supported running on soft surfaces to relieve joints that were in recovery from injury. The second position supported running on hard surfaces since soft surfaces can be uneven, which may make worse those injuries a soft surface was intended to help.

Suppose we are given sufficient funds to run an experiment to study this topic. With no studies to support either position, which of the following hypotheses would be appropriate?

- The first position is more sensible, so this should be a one-sided test. In this case, we should form the alternative hypothesis around the second position.
- Because there is uncertainty, we should postpone defining the hypotheses until after we collect data to guide the test.
- The second position makes the more sense, so this should be a one-sided test. In this case, we should form the alternative hypothesis around the first position.
- Because we would be interested in any difference between running on hard and soft surfaces, we should use a two-sided hypothesis test.

Question Help: Video Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 6

The mean weight of female aerobics instructors in a certain city is at most 134 lbs. Express the null and alternative hypotheses in symbolic form for this claim.

$H_0 : \mu$ [ ]

$H_1 : \mu$ [ ]

Use the following codes to enter the following symbols:

$\geq$ enter >=
$\leq$ enter <=
$\neq$ enter !=

Question Help: Post to forum

Submit Question

HW E11: Hypothesis Testing of Means

Score: 0/20 0/10 answered

Question 7

The national average SAT score is roughly 1500. We would like to see if the high school seniors who apply to Duke have higher than average SAT scores. We randomly sample 100 applicants' files and record their SAT scores. Which of the following is the correct set of hypotheses for this research question? Hint: think about how many samples we have data from.

- $H_0: \mu = 1500; H_A: \mu > 1500$
- $H_0: x = 1500; H_A: x > 1500$
- $H_0: \mu_{Duke} = \mu_{National}; H_A: \mu_{Duke} > \mu_{National}$
- $H_0: p = 1500; H_A: p > 1500$
- $H_0: \mu = 1500; H_A: \mu \neq 1500$

Question Help: Post to forum

Submit Question

You wish to test the following claim (HaHa) at a significance level of $\alpha=0.001$$\alpha=0.001$.

Ho:μ=76.3Ho:μ=76.3
Ha:μ>76.3Ha:μ>76.3

You believe the population is normally distributed, but you do not know the standard deviation. You obtain a sample of size n=8n=8 with mean M=86.4M=86.4 and a standard deviation of SD=11.9SD=11.9.

What is the p-value for this sample? (Report answer accurate to four decimal places.)
p-value =

The p-value is...

- less than (or equal to) $\alpha$$\alpha$
- greater than $\alpha$$\alpha$

This p-value leads to a decision to...

- reject the null
- accept the null
- fail to reject the null

As such, the final conclusion is that...

- There is sufficient evidence to warrant rejection of the claim that the population mean is greater than 76.3.
- There is not sufficient evidence to warrant rejection of the claim that the population mean is greater than 76.3.
- The sample data support the claim that the population mean is greater than 76.3.
- There is not sufficient sample evidence to support the claim that the population mean is greater than 76.3.

(Ctrl)

You wish to test the following claim (HaHa) at a significance level of $\alpha=0.01\alpha=0.01$.

$H_o:\mu=50.8Ho:\mu=50.8$
$H_a:\mu<50.8Ha:\mu<50.8$

You believe the population is normally distributed, but you do not know the standard deviation. You obtain a sample of size $n=8n=8$ with mean $M=47.3M=47.3$ and a standard deviation of $SD=9.8SD=9.8$.

What is the test statistic for this sample? (Report answer accurate to three decimal places.)

test statistic =

What is the p-value for this sample? (Report answer accurate to four decimal places.)

p-value =

The p-value is...

- less than (or equal to) $\alpha\alpha$
- greater than $\alpha\alpha$

This test statistic leads to a decision to...

- reject the null
- accept the null
- fail to reject the null

As such, the final conclusion is that...

- There is sufficient evidence to warrant rejection of the claim that the population mean is less than 50.8.
- There is not sufficient evidence to warrant rejection of the claim that the population mean is less than 50.8.
- The sample data support the claim that the population mean is less than 50.8.
- There is not sufficient sample evidence to support the claim that the population mean is less than 50.8.

You wish to test the following claim (HaHa) at a significance level of $\alpha=0.005\alpha=0.005$.

$H_o:\mu=54.8Ho:\mu=54.8$
$H_a:\mu<54.8Ha:\mu<54.8$

You believe the population is normally distributed, but you do not know the standard deviation. You obtain a sample of size $n=59n=59$ with mean $M=51.4M=51.4$ and a standard deviation of $SD=14.5SD=14.5$.

What is the test statistic for this sample? (Report answer accurate to three decimal places.)

test statistic =

What is the p-value for this sample? (Report answer accurate to four decimal places.)

p-value =

The p-value is...

- less than (or equal to) $\alpha\alpha$
- greater than $\alpha\alpha$

This test statistic leads to a decision to...

- reject the null
- accept the null
- fail to reject the null

As such, the final conclusion is that...

- There is sufficient evidence to warrant rejection of the claim that the population mean is less than 54.8.
- There is not sufficient evidence to warrant rejection of the claim that the population mean is less than 54.8.
- The sample data support the claim that the population mean is less than 54.8.
- There is not sufficient sample evidence to support the claim that the population mean is less than 54.8.