

Statistics

Lecture 46



Feb 19-8:47 AM

Testing One Population Mean:

$H_0: \mu = \mu_0$	$H_0: \mu \geq \mu_0$	$H_0: \mu \leq \mu_0$
$H_1: \mu \neq \mu_0$	$H_1: \mu < \mu_0$	$H_1: \mu > \mu_0$
TTT	LTT	RTT

Case I: σ Known

CV $\rightarrow Z = \text{InvNorm}$
 Drawing, labeling, Shading, TI ✓

CTS Z
 P-value P

STAT TESTS Z-Test
 inpt: **Stats**

Use Testing chart to determine the validity of H_0 & H_1 .

Final Conclusion must be about the claim.
Reject the claim OR FTR The claim

Nov 20-8:56 AM

Given $n=32$, $\bar{x}=85$, $H_0: \mu=82$
 claim is H_1 , $\alpha=.02$, $\sigma=12$

Test the claim. Since σ is known
 $H_0: \mu=82$ CV Z TTT $\alpha=.02$
 $H_1: \mu \neq 82$ TTT claim

Since σ is known
 Z-Test
 inpt: Stats
 $\mu_0 = 82$ H_0
 $\sigma = 12$
 $\bar{x} = 85$
 $n = 32$
 $\mu \neq \mu_0$ H_1 Calculate

CTS $Z = 1.414$
 P-value $P = .157$

$Z = \text{invNorm}(.99, 0, 1)$

CTS is in NCR. H_0 valid
 P-value $> \alpha$
 $.157 > .02$
 H_1 invalid
 Invalid claim
 Reject the claim

Nov 21-9:02 AM

The college claims that the mean age of all students is more than 32. $\mu > 32$

In a sample of 40 students, their mean age was 35. $n=40$ $\bar{x}=35$

It is known that standard deviation of ages of all students is 10. $\sigma=10$

Test the claim. \rightarrow No $\alpha \rightarrow$ use .05

$H_0: \mu \leq 32$
 $H_1: \mu > 32$ claim, RTT

σ Known
 CV Z RTT $\alpha=.05$

CTS $Z = 1.997$
 P-value $P = .029$

Z-Test
 inpt: Stats
 $\mu_0 = 32$ H_0
 $\sigma = 10$
 $\bar{x} = 35$
 $n = 40$
 $\mu > \mu_0$ H_1

$Z = \text{invNorm}(.95, 0, 1)$

CTS is in CR. H_0 invalid
 P-value $\leq \alpha$
 $.029 \leq .05$
 H_1 Valid
 valid claim
 FTR the claim

Nov 21-9:14 AM

Testing One Population Mean:

$H_0: \mu = \mu_0$	$H_0: \mu \geq \mu_0$	$H_0: \mu \leq \mu_0$
$H_1: \mu \neq \mu_0$	$H_1: \mu < \mu_0$	$H_1: \mu > \mu_0$
TTT	LTT	RTT

Case I: σ Known	Case II: σ Unknown
CV $\rightarrow Z = \text{invNorm}$ Drawing, labeling, Shading, TI ✓	CV $\rightarrow t = \text{invT}$ $df = n - 1$ Drawing, labeling, Shading, TI ✓
CTS Z P-value P [STAT] [TESTS] [Z-Test] inpt: [Stats]	CTS t P-value P [STAT] [TESTS] [T-Test] inpt: [Stats]

Use Testing chart to determine the validity of H_0 & H_1 .

Final Conclusion must be about the claim.
Reject the claim OR FTR The claim

Nov 20-8:56 AM

Given: $n = 15$, $\bar{x} = 70$, $s = 10$, $\alpha = .1$

$H_0: \mu \geq 72$, claim is H_0 .

Test the claim.

$H_0: \mu \geq 72$ claim
 $H_1: \mu < 72$ LTT

CTS $t = -.775$
P-value $P = .226$

[T-Test]
inpt: [Stats]
 $\mu_0: 72$ H_0
 $\bar{x} = 70$
 $s = 10$
 $n = 15$
 $\mu < \mu_0$ H_1
[Calculate]

σ Unknown
CV t LTT $\alpha = .1$
 $df = n - 1 = 15 - 1 = 14$

$\mu = 0$
 σ Unknown
 $df = 14$
 $t = \text{invT}(.1, 14)$

CTS is in NCR. H_0 Valid
P-value $> \alpha$ H_1 invalid
valid claim
FTR the claim

Nov 21-9:30 AM

I randomly selected 10 students.
 Here are their ages:

26	20	18	30	32
25	20	19	28	25

store in L1
 Use 1-Var Stats
 $\bar{x} \approx 24$
 $S \approx 5$ } Round to whole #

NO α
 Test the claim that
 mean age of all students is 28 yrs. $\mu = 28$

$H_0: \mu = 28$ claim
 $H_1: \mu \neq 28$ TTT

CV t TTT $\alpha = .05$
 $df = n - 1 = 10 - 1 = 9$

CTS $t = -2.530$
 P-value $P = .032$
 T-Test

$t = \text{invT}(.975, 9)$
 $\mu = 0$
 σ unknown
 $df = 9$

CTS is in CR H_0 invalid \rightarrow Invalid claim
 $P\text{-value} \leq \alpha \Rightarrow H_1$ valid Reject the claim

Nov 21-9:42 AM