Statistics

Lecture 14

Feb 19-8:47 AM

SE 25

Testing One Population Proportion:

$H_0: P = P_0$ $\quad H_1: P \neq P_0$ — TTT

$H_0: P \leq P_0$ $\quad H_1: P > P_0$ — RTT

$H_0: P \geq P_0$ $\quad H_1: P < P_0$ — LTT

Always identify the claim

Find all Critical Values

Draw, label, shade, use invNorm

Find Computed Test statistic z & P-value P

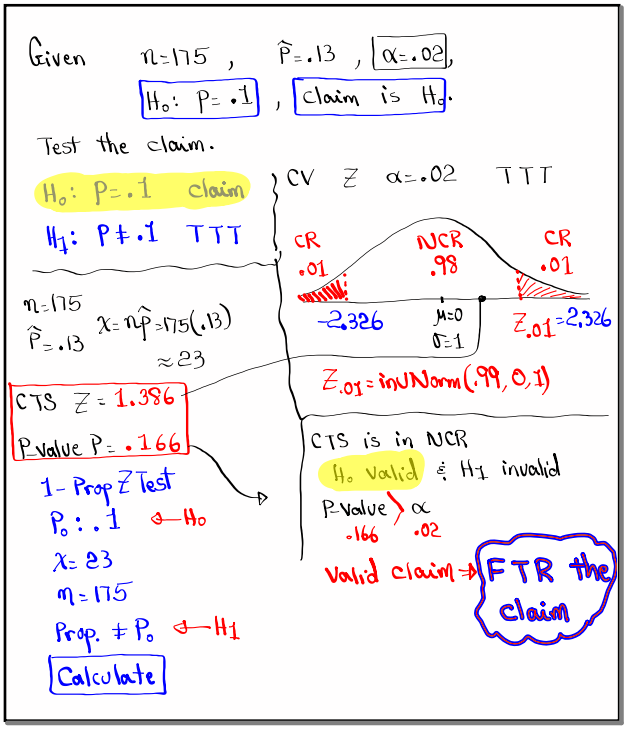
1-PropZTest, $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$

use Testing Chart to determine the validity of H_0 & H_1:

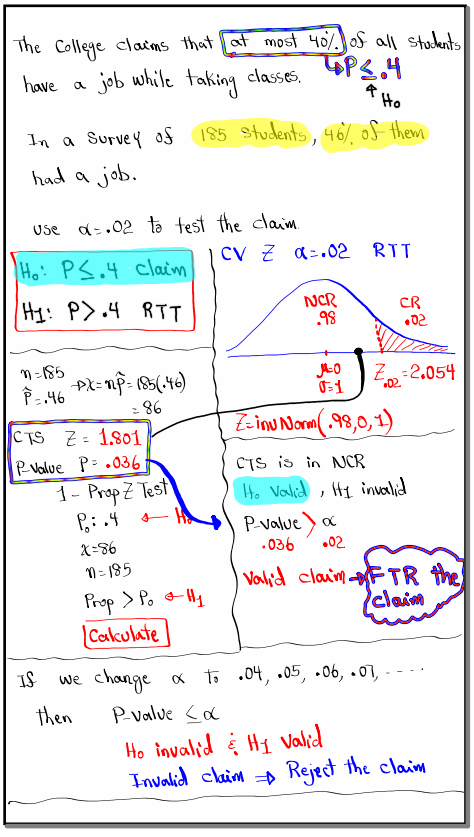
Draw Final Conclusion about the Claim.

Reject the claim when claim is invalid **OR FTR the claim** when claim is valid

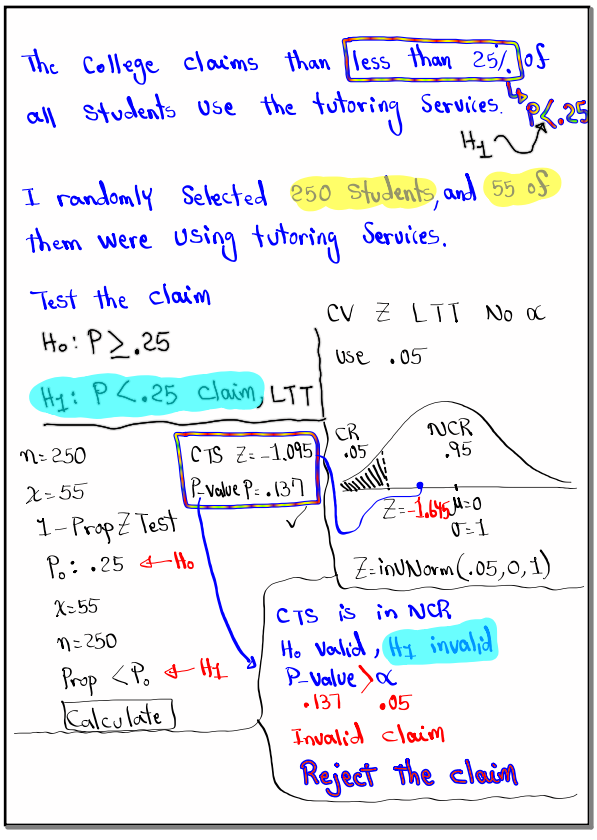
Nov 28-6:50 PM



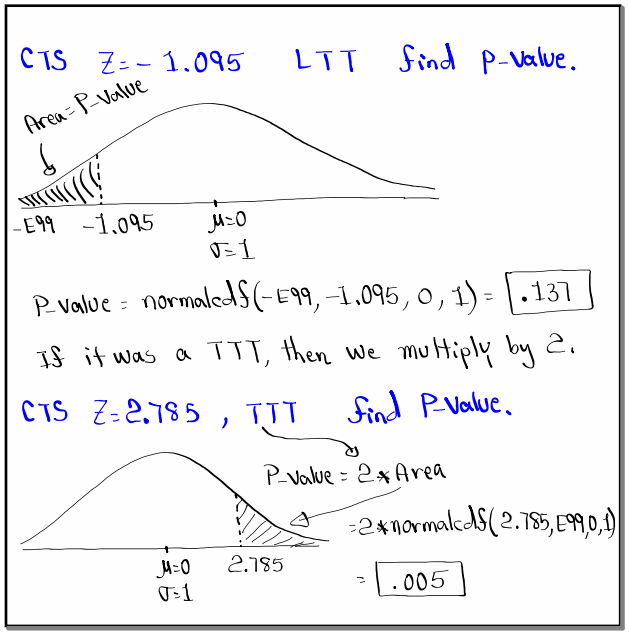
Nov 28-6:58 PM



Nov 28-7:10 PM



Nov 28-7:25 PM



Nov 28-7:39 PM

Testing One Population Mean:

$H_0: \mu = \mu_0$ | $H_0: \mu \leq \mu_0$ | $H_0: \mu \geq \mu_0$

$H_1: \mu \neq \mu_0$ | $H_1: \mu > \mu_0$ | $H_1: \mu < \mu_0$

TTT | RTT | LTT

Always identify the claim

Case I: σ Known

CV $\bar{x}$ invNorm

Drawing, labeling, Shading

TI Command

CTS $\bar{x}$

P-value P ⇒ Z-Test

Inpt: Stats

Use Testing Chart to determine the validity of H_0 & H_1

Final Conclusion must be made about the claim

Reject the claim OR **FTR the claim**

claim is invalid | Claim is Valid

Nov 28-7:59 PM

Given $n=40$, $\bar{x}=85$, $\sigma=10$

$H_0: \mu = 80$, $\alpha = .1$, claim is H_1

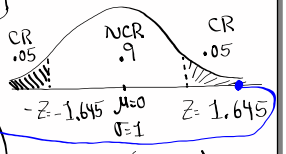
Test the claim

$H_0: \mu = 80$

$H_1: \mu \neq 80$, TTT, claim

Since σ is Known

CV $\bar{x}$ $\alpha=.1$, TTT



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

CTS $\bar{x} = 3.162$

P-value P = .002

Z-Test

Inpt: Stats

$\mu_0 = 80$ ← H_0

$\sigma = 10$

$\bar{x} = 85$

$n = 40$

$\mu \neq \mu_0$ ← H_1

Calculate

CTS is in CR

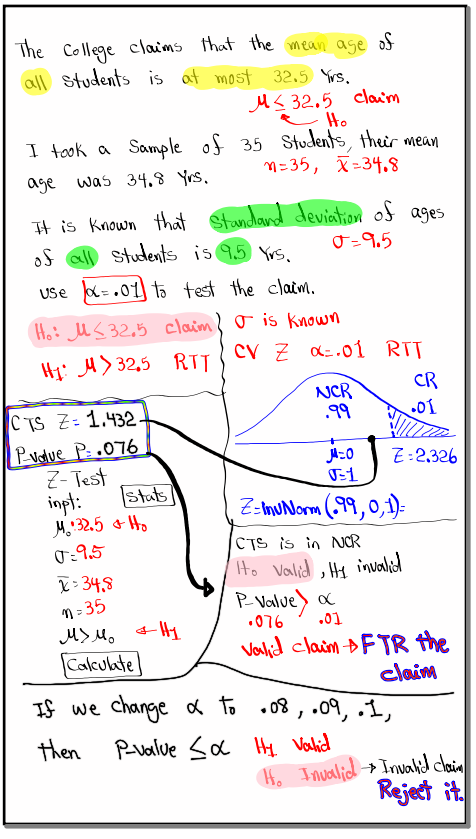
H_0 invalid, H_1 Valid

P-value $\leq \alpha$

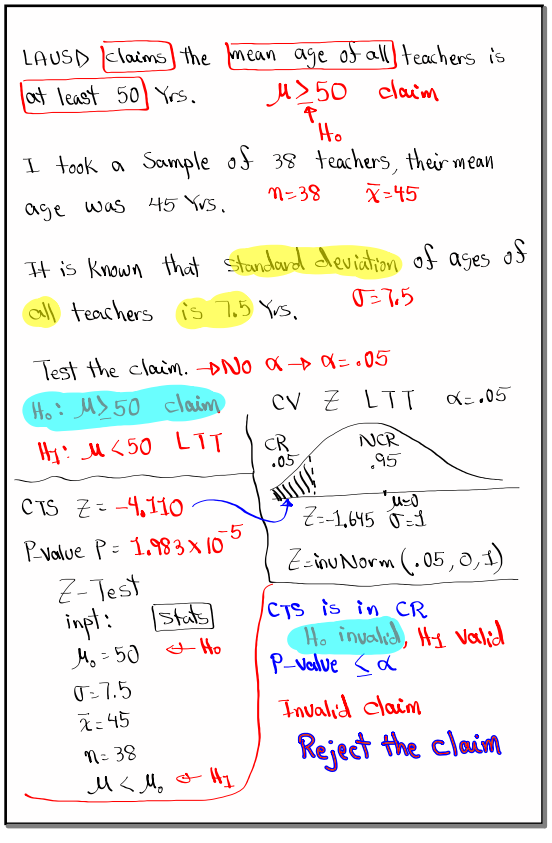
.002 .1

Valid claim → FTR the claim

Nov 28-8:06 PM



Nov 28-8:17 PM



Nov 28-8:32 PM

Testing One Population Mean:

$H_0: \mu = \mu_0$ | $H_0: \mu \leq \mu_0$ | $H_0: \mu \geq \mu_0$

$H_1: \mu \neq \mu_0$ | $H_1: \mu > \mu_0$ | $H_1: \mu < \mu_0$

TTT | RTT | LTT

Always identify the claim

Case I: σ Known	Case II: σ Unknown
CV z invNorm	CV t invT $df = n-1$
Drawing, labeling, Shading TI Command	Drawing, labeling, Shading, TI Command
CTS z P-value P $\Rightarrow$ z-Test inpt: Stats	CTS t P-value P $\Rightarrow$ T-Test inpt: STATS

use Testing Chart to determine the validity of H_0 & H_1

Final Conclusion must be made about the claim

Reject the claim OR FTR the claim

claim is invalid | Claim is Valid

Nov 28-7:59 PM

Given $n = 15$ $\bar{x} = 135$, $S = 24$,

$H_0: \mu \leq 125$, claim is H_0,

Test the claim

$H_0: \mu \leq 125$ claim

$H_1: \mu > 125$ RTT

σ Unknown

CV t RTT $df = n-1 = 14$

NO $\alpha \rightarrow$ use .05

CTS $t = 1.614$

P-value $P = .064$

T-Test

inpt: STATS

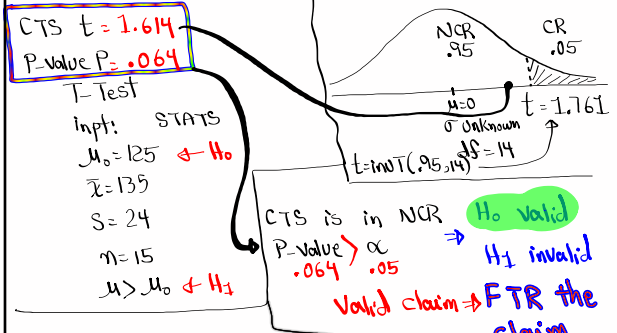
$\mu_0 = 125$ $\leftarrow H_0$

$\bar{x} = 135$

$S = 24$

$n = 15$

$\mu > \mu_0$ $\leftarrow H_1$



CTS is in NCR $\Rightarrow$ H_0 Valid

P-value $> \alpha$

.064 > .05

H_1 invalid

Valid claim $\Rightarrow$ FTR the claim

If we change α to .07, .08, .09, .1, ...

then P-value $\leq \alpha$ $\Rightarrow$ H_0 invalid, H_1 Valid

Invalid claim $\Rightarrow$ Reject the claim

Nov 28-8:57 PM

10 randomly Selected nurses had a mean Salary of $6800/mo. with Stand. dev. of $500.

$n=10$, $\bar{x}=6800$, $S=500$

Test the claim using $\alpha=.01$ that mean Salary of all nurses is more than $6500/mo.

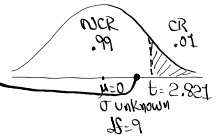
$\mu > 6500$ ↑ H_1

$H_0: \mu \leq 6500$

$H_1: \mu > 6500$ claim, RTT

CTS $t=1.897$
P-Value $P=.045$
T-Test
Input Stats
$\mu_0=6500$ ← H_0
$\bar{x}=6800$
$S=500$
$n=10$
$\mu > \mu_0$ ← H_1

σ Unknown
CV t RTT $df=n-1=9$
$\alpha=.01$



$t=\text{invT}(.99,9)=2.821$

CTS is in NCR ⇒ H_0 Valid
P-Value > α
.045 > .01
H_1 invalid Invalid claim
Reject the claim

Suggest a value for α to FTR the claim

P-value $\leq \alpha$
$.045 \leq \alpha$

Pick
.05, .06, .07, .08, .09, .1

Nov 28-9:08 PM

Extra Credit III:

Drawing, labeling, shading, full TI command required.

Read my email, watch the video in the email before attempting extra credit III.

Pay close attention to due date.

I will send you additional lecture for S6.2?.

Nov 28-9:20 PM