Statistics

Lecture 26

Feb 19-8:47 AM

Testing One Population Proportion:

SG 25

$H_0: P = P_0$	$H_0: P \leq P_0$	$H_0: P \geq P_0$
$H_1: P \neq P_0$	$H_1: P > P_0$	$H_1: P < P_0$
TTT	RTT	LTT

Always identify the claim

CV z invNorm

Drawing, labeling, shading, Full TI command required.

CTS z ⇒ 1-Prop Z Test

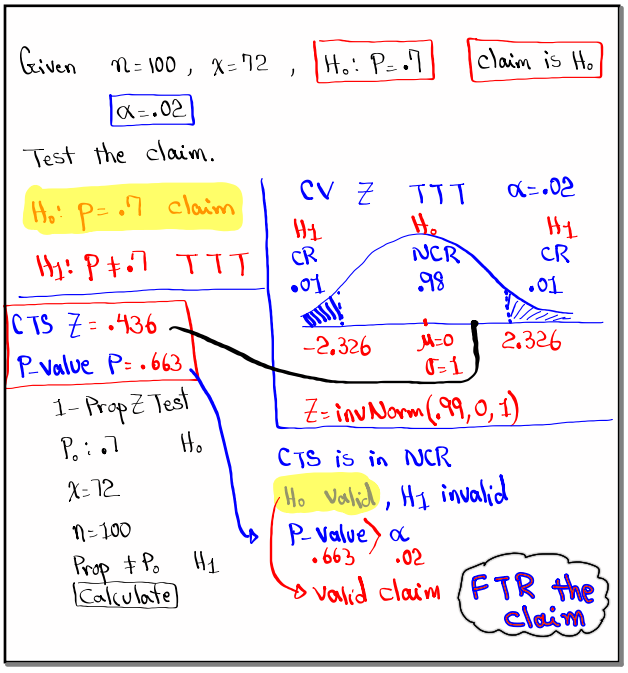
P-value P

use testing chart to determine the validity of H_0 & H_1.

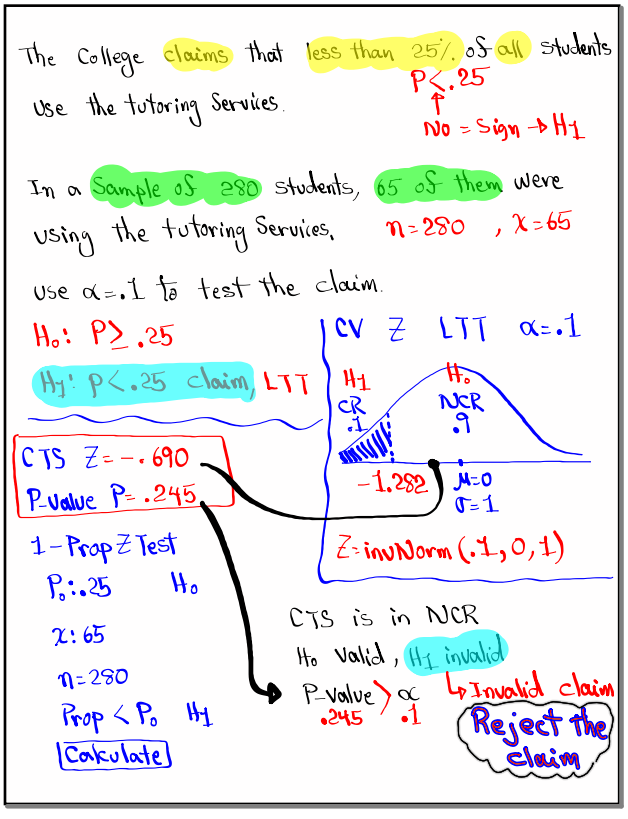
Draw final conclusion for the claim

Reject the claim when claim is invalid OR **Fail-to-Reject the claim** when claim is valid.

Dec 6-7:21 AM



Dec 6-7:29 AM



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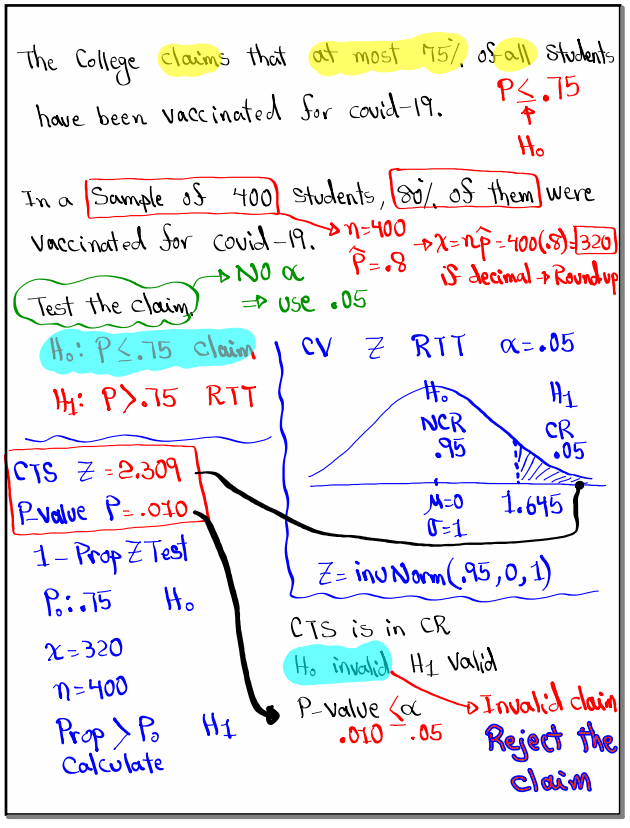
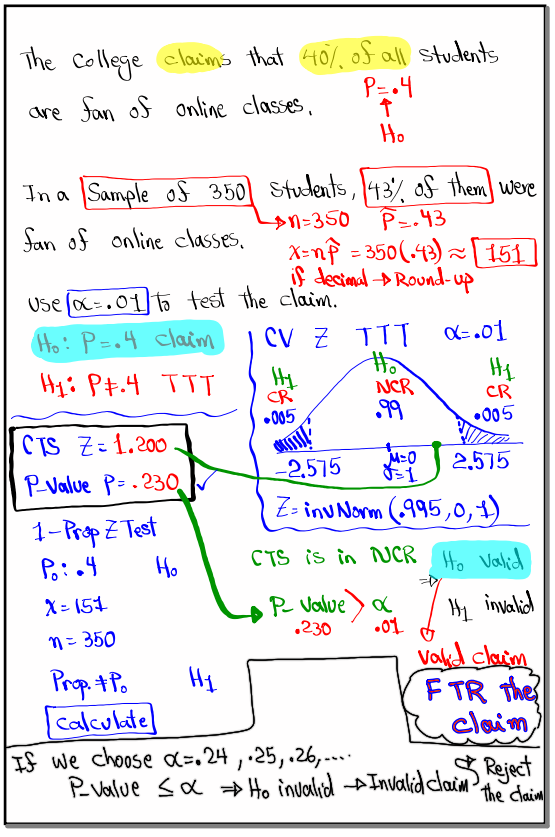


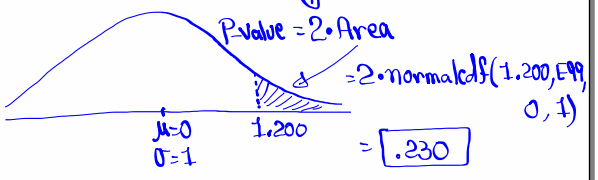
Dec 6-7:55 AM



Dec 6-8:08 AM

Doing Reverse

CTS $Z = 1.200$, TTT Find P-value.

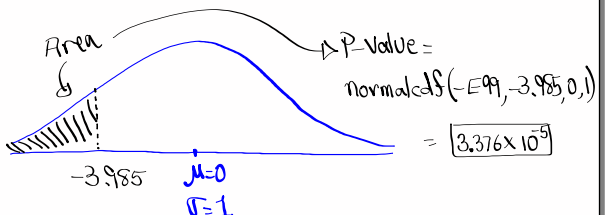


$= 2 \cdot \text{normalcdf}(1.200, E99, 0, 1)$

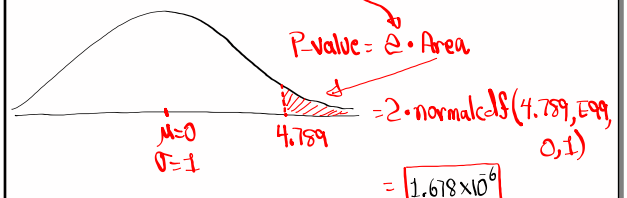
$= \boxed{.230}$

Dec 6-8:21 AM

CTS $Z = -3.985$, LTT , Find P-value.



CTS $Z = 4.789$, TTT , find P-value



$= 2 \cdot \text{normalcdf}(4.789, E99, 0, 1)$

$= \boxed{1.678 \times 10^{-6}}$

Dec 6-8:24 AM

Testing One Population Mean:

$H_0: \mu = \mu_0$ $H_1: \mu \neq \mu_0$ TTT

$H_0: \mu \leq \mu_0$ $H_1: \mu > \mu_0$ RTT

$H_0: \mu \geq \mu_0$ $H_1: \mu < \mu_0$ LTT

Case I: σ Known

CV z invNorm

CTS z $\Rightarrow z$-Test

P-value P inpt: STATS

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

Draw Final Conclusion about the claim

Reject the claim OR FTR the claim

"claim is invalid" "claim is valid"

Dec 6-8:45 AM

Given: $n=36$, $\bar{x}=85$, $\sigma=10$, $\alpha=.1$

$H_0: \mu=80$ claim is H_1

Test the claim.

$H_0: \mu=80$

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

CTS $z=3$

P-value P=.003

z-Test

inpt: STATS

μ_0: 80 H_0

$\sigma=10$

$\bar{x}=85$

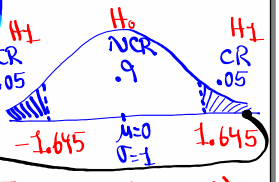
$n=36$

$\mu \neq \mu_0$ H_1

Calculate

Since σ is known

CV z TTT $\alpha=.1$



$z=$invNorm(.95,0,1)

CTS is in CR $\Rightarrow H_0$ invalid

P-value $\leq \alpha$

.003 .1

H_1 Valid

valid claim

FTR the claim

Dec 6-8:51 AM

Math Department claims that the mean of all exams is at most 85. $\mu \leq 85$ (H_0)

I took a Sample of 40 exams, their mean score was 88. $n=40$, $\bar{x}=88$

It is known that Standard deviation of scores of all exams is 12.5. $\sigma=12.5$

Test the claim.

$H_0: \mu \leq 85$ claim

$H_1: \mu > 85$ RTT

CTS $Z = 1.518$

P-value $P = .065$

Z-Test

inpt: STATS

$\mu_0: 85$ H_0

$\sigma: 12.5$

$\bar{x}: 88$

$n: 40$

$\mu > \mu_0$ H_1

Calculate

σ Known

CV Z RTT No α ⇒ use .05

H_0 NCR .95 | H_1 CR .05

$\mu=0$ $\sigma=1$ 1.645

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

CTS is in NCR ⇒ H_0 Valid

H_1 invalid

valid claim

FTR the claim

P-value > α

.065 .05

If we change α to .07, .08, .09, .10

P-value $\leq \alpha$

H_0 invalid → Invalid claim → Reject the claim

H_1 valid

Dec 6-9:03 AM

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

Case I: σ Known	Case II: σ unknown
CV z invNorm	CV t invT df = n-1
CTS z ⇒ Z-Test	CTS t ⇒ T-Test
P-value P inpt: STATS	P-value P inpt: Stats

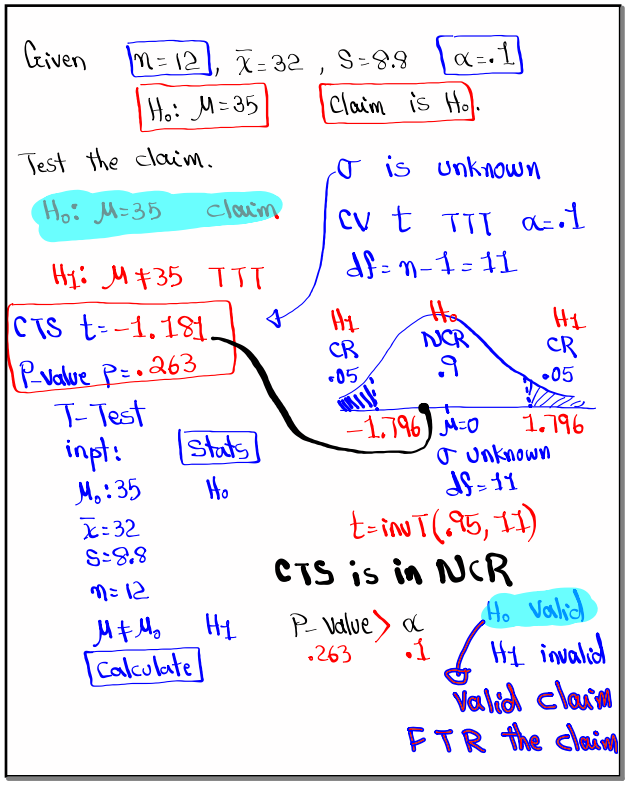
Use Testing Chart to determine the validity of H_0 & H_1.

Draw final conclusion about the claim

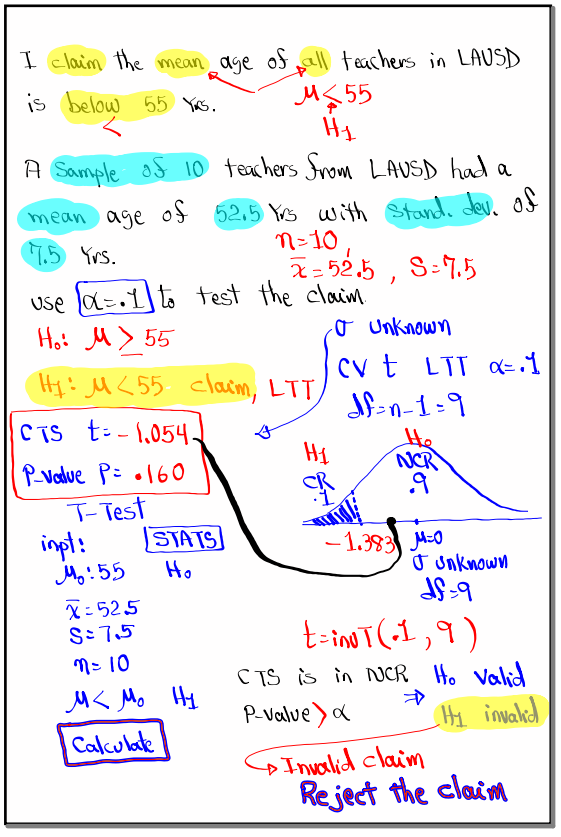
Reject the claim OR FTR the claim

"claim is invalid" "claim is valid"

Dec 6-8:45 AM



Dec 6-9:22 AM



Dec 6-9:35 AM