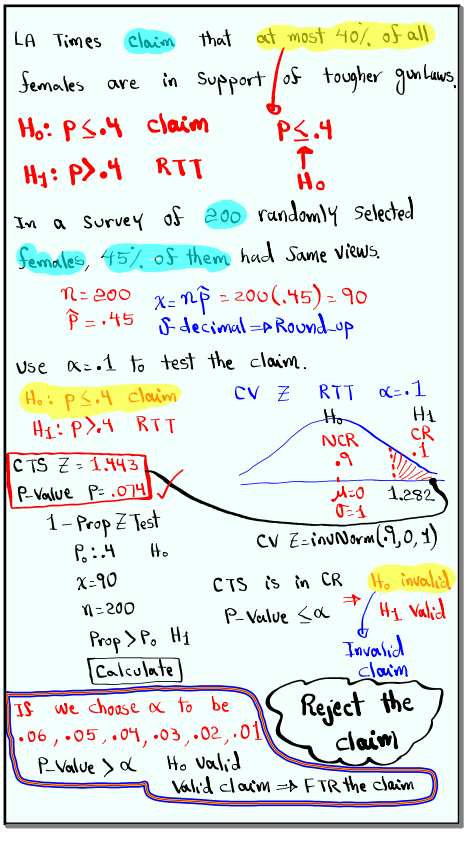
Statistics

Lecture 15

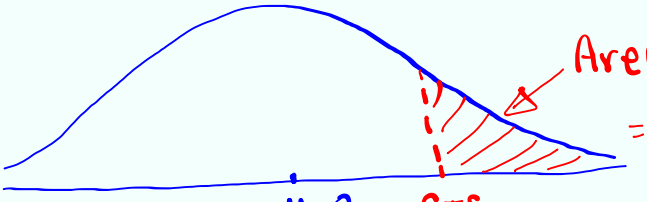
Feb 19-8:47 AM



Feb 6-4:33 PM

Doing reverse

CTS $Z = 1.443$, RTT find p-value



Area = P-Value
= normalcdf(1.443, E99, 0, 1)
= .075

Feb 6-4:47 PM

Testing One Population Mean μ:

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

Case I: σ Known

CV Z invNorm

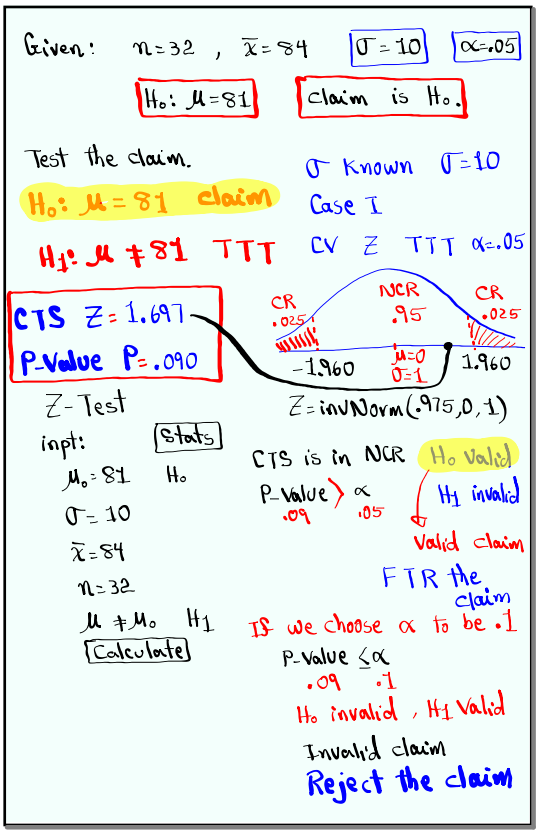
CTS Z
P-Value P
Z-Test

Proceed with testing chart to determine the validity of H_0 & H_1.

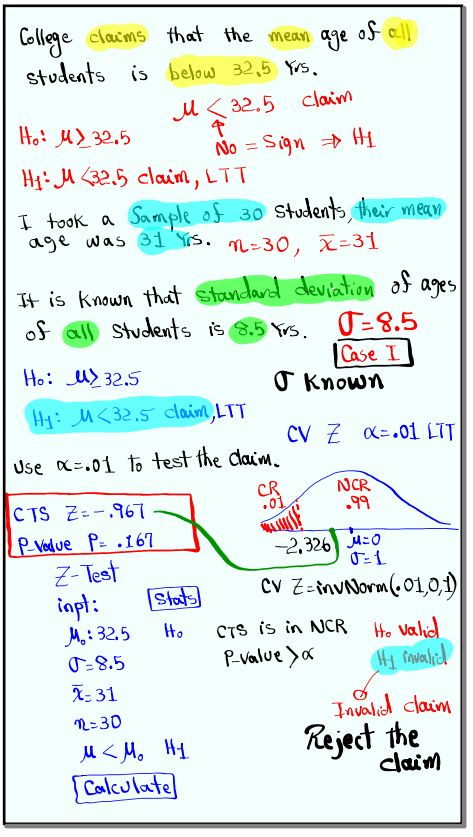
Final Conclusion for the actual claim

Reject the claim OR FTR the claim

Feb 6-4:50 PM



Feb 6-4:56 PM



Feb 6-5:07 PM

Testing One Population Mean μ:

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

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

TTT | LTT | RTT

Case I: σ Known	Case II: σ Unknown
CV z invNorm	CV t invT $df = n-1$
CTS z P-Value P z-Test	CTS t P-Value P T-Test

Proceed with testing chart to determine the validity of H_0 & H_1.

Final Conclusion For the actual claim

Reject the claim OR FTR the claim

Feb 6-4:50 PM

Given: $n=15$ $\bar{x}=85$ $s=9$ $\alpha=.02$

$H_0: \mu \leq 82$ claim is H_1.

Test the claim.

$H_0: \mu \leq 82$

$H_1: \mu > 82$ claim, RTT

σ unknown

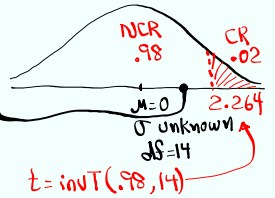
Case II

CV t RTT $\alpha=.02$

$df = n-1 = 15-1 = 14$

CTS $t = 1.291$

P-Value $P = .109$



$t = invT(.98, 14)$

T-Test

inpt: Stats

$\mu_0: 82$ H_0

$\bar{x}=85$

$s=9$

$n=15$

$\mu > \mu_0$ H_1

Calculate

CTS is in NCR

P-Value $>$ α

.109 .02

H_0 valid

H_1 invalid

Invalid claim

Reject the claim

If we choose α to be .11, .12, .13, .14, .15, - - -

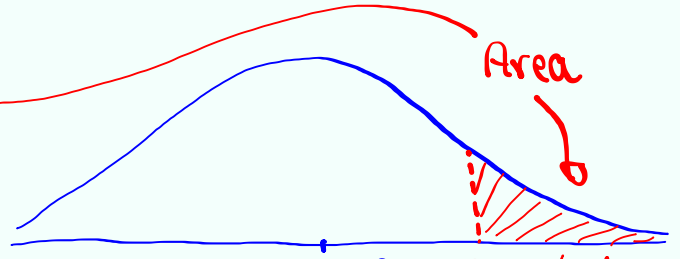
P-Value $\leq \alpha$ H_0 invalid H_1 valid → Valid claim FTR the claim

Feb 6-5:24 PM

doing reverse

CTS $t = 1.291$ RTT $df = 14$

find p-value.



P-Value =

tcdf(1.291, E99, 14)

L U df

σ unknown

df=14

= .109

Feb 6-5:37 PM

LA Times has reported that the mean monthly Salary of all nurses in LA county is at least $7500. $H_0: \mu \geq 7500$ claim

$H_1: \mu < 7500$ LTT

I took a Sample of 12 nurses, their mean monthly Salary was $7250 with Standard deviation of $400. $n=12, \bar{x}=7250, S=400$

σ unknown

Use $\alpha = .1$ to test the validity of the report.

$H_0: \mu \geq 7500$ claim

$H_1: \mu < 7500$ LTT

σ unknown

Case II

CV t LTT $\alpha = .1$

$df = n-1 = 12-1 = 11$

CTS $t = -2.165$

P-Value $P = .027$

T-Test

inpt: Stats

μ_0: 7500 H_0

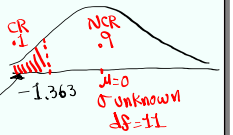
$\bar{x}$: 7250

S: 400

n: 12

$\mu < \mu_0$ H_1

Calculate



CV $t = invT(.1, 11)$

CTS is in CR.

P-Value $< \alpha$

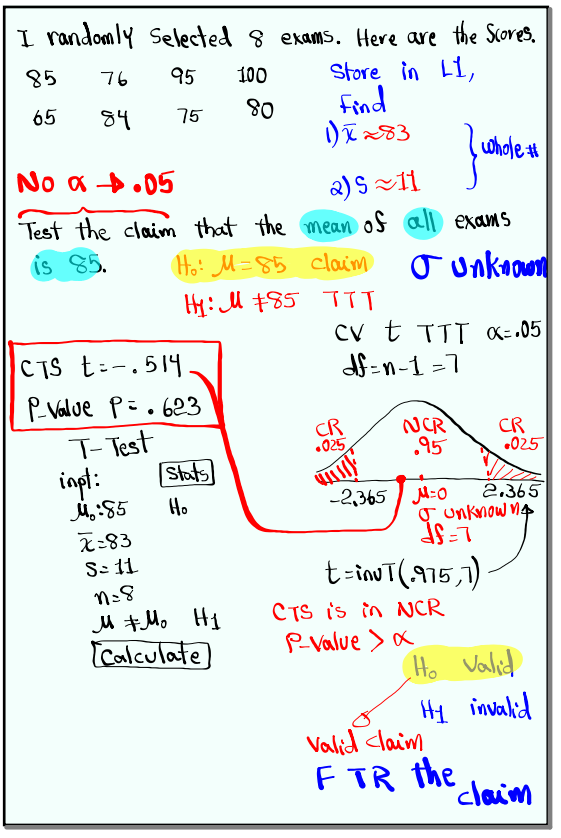
H_0 invalid

H_1 Valid

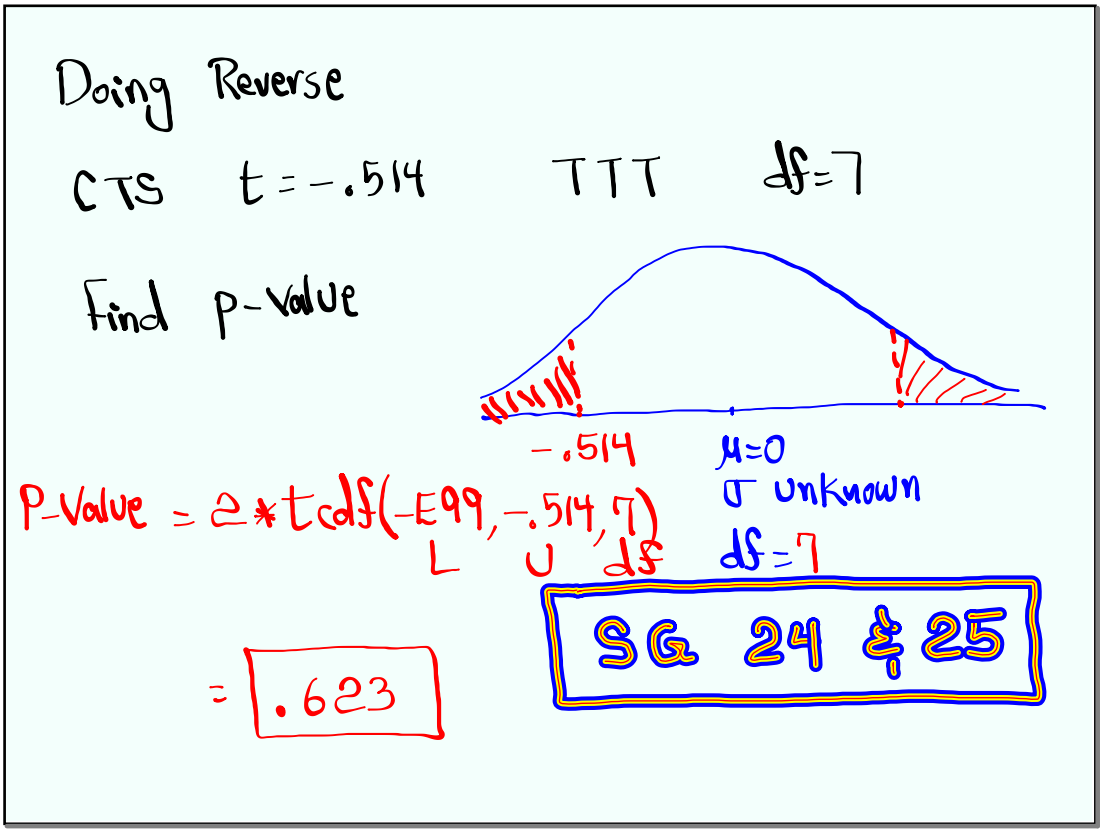
Invalid claim

Reject the claim

Feb 6-5:58 PM



Feb 6-6:11 PM



Feb 6-6:22 PM

Consider the chart below

x	y
2	5
3	8
3	6
4	10
5	10

1) $n = 5$

2) $x \to L1$, $y \to L2$

3) Use LinReg(a+bx)

$a = 1.654$

$b = 1.808$

$r^2 = .817$

$r = .904$

Regression line

$\boxed{y \approx 1.7 + 1.8x}$

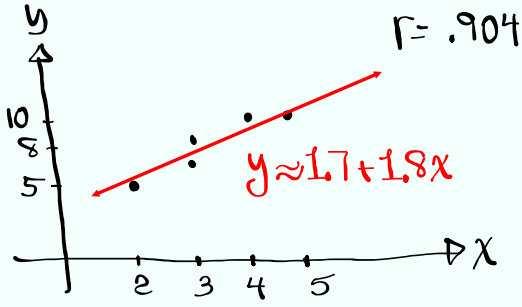
$r^2 \approx 82\%$

$r = .904$

It is close to 1

Linear Correlation

Seems to be Significant.



Feb 6-6:29 PM

Testing linear Correlation Coefficient

r

$H_0: \rho = 0$ (ρ = rho) Not Significant

$H_1: \rho \neq 0$ Is Significant

For CTS $t = 3.659$

P-Value $P = .035$

STAT TESTS ↓ LinReg T Test

If $\alpha = .05$

P-Value $\leq \alpha$

H_0 invalid

H_1 Valid

Linear Correlation is Significant.

Xlist: L1

Ylist: L2

Freq: 1

$\rho \neq 0$

RegEq: Blank

Calculate

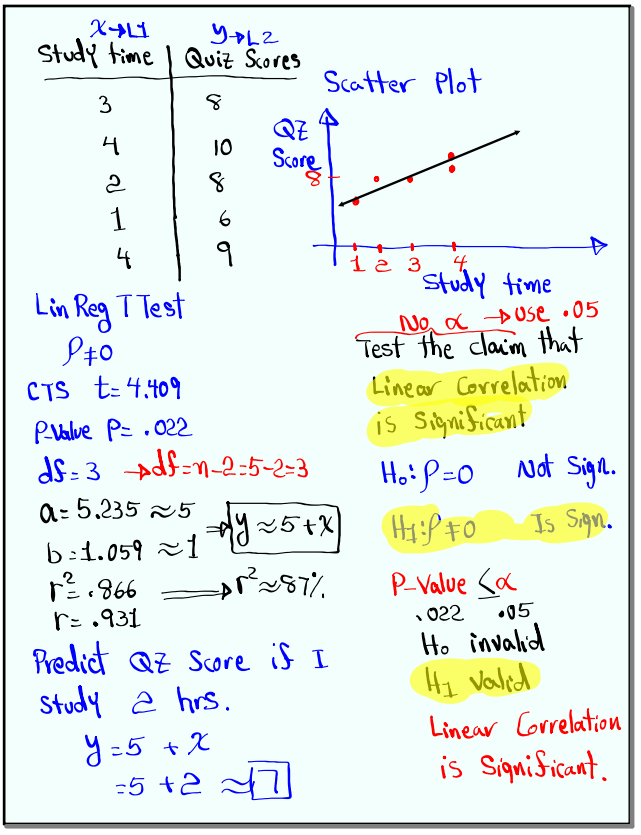
If $\alpha = .02$

P-Value $> \alpha$

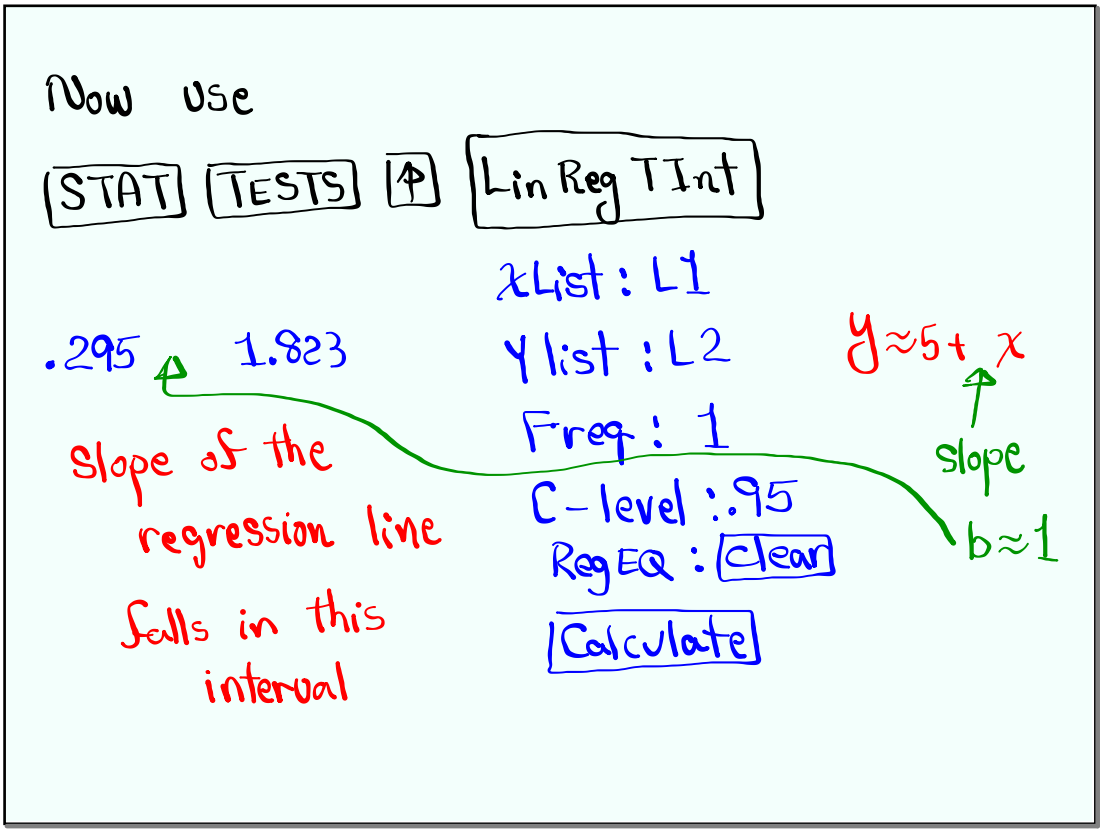
H_0 Valid → Linear Correlation is not Significant.

H_1 invalid

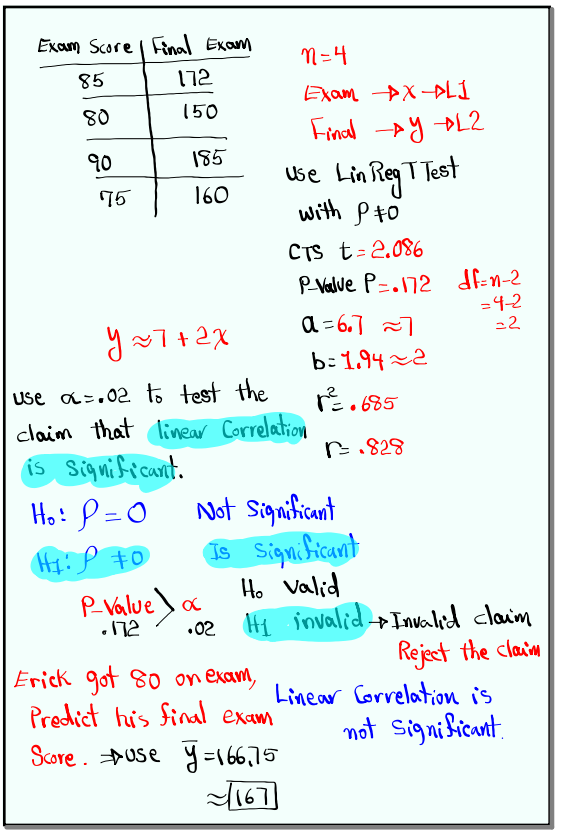
Feb 6-6:36 PM



Feb 6-6:46 PM



Feb 6-6:59 PM


Exam Score | Final Exam
85 | 172
80 | 150
90 | 185
75 | 160
n=4
Exam → x → L1
Final → y → L2
Use LinRegTTest
with ρ≠0
CTS t=2.086
P-Value P=.172
df=n-2
=4-2
=2
a=6.7 ≈7
b=1.94≈2
y≈7+2x
r²=.685
r=.828
use α=.02 to test the
claim that linear Correlation
is Significant.
H₀: ρ=0
H₁: ρ≠0
Not Significant
Is Significant
P-Value > α
.172 .02
H₀ valid
H₁ invalid → Invalid claim
Reject the claim
Erick got 80 on exam,
Predict his final exam
Score. → use ȳ=166.75
≈167
Linear Correlation is
not Significant

Feb 6-7:04 PM