Statistics

Lecture 29

Feb 19-8:47 AM

LA Times claims that standard deviation of Salaries of all nurses in LA is below $500.

$\sigma < 500$ ← H_1

I Surveyed 10 nurses in LA, Standard deviation of their Salaries was $475.

$n = 10$

$S = 475$

No $\alpha \to .05$

Test the claim.

$H_0: \sigma \geq 500$

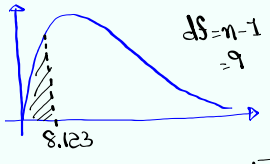
$H_1: \sigma < 500$ claim, LTT

CTS

$\chi^2 = \frac{(n-1)\cdot s^2}{\sigma^2}$

$= \frac{(10-1)\cdot 475^2}{500^2}$

$= 8.123$



P-Value $= \chi^2 df(0, 8.123, 9) = .478$

P-Value $> \alpha$

.478 $> .05$

H_0 Valid

H_1 invalid

Invalid claim

Reject the claim

Jun 4-1:48 PM

12 female nurses had a standard deviation of $500 in their salaries. $n=12$, $S=500$

10 males nurses had a standard deviation of $400 in their salaries. $n=10$, $S=400$

use $\alpha=.1$ to test the claim that there is a difference in standard deviations of all salaries between females & males.

$H_0: \sigma_1 = \sigma_2$

$H_1: \sigma_1 \neq \sigma_2$ claim, TTT

CTS $F = 1.5625$

P-value $p = .512$ ✓

2-SampF Test

Females	Males
$n_1=12$	$n_2=10$
$S_1=500$	$S_2=400$

$S_1 > S_2$

$NdF = n_1 - 1 = 11$

$DdF = n_2 - 1 = 9$

P-Value $>$ α

.512 .1

H_0 valid, H_1 invalid

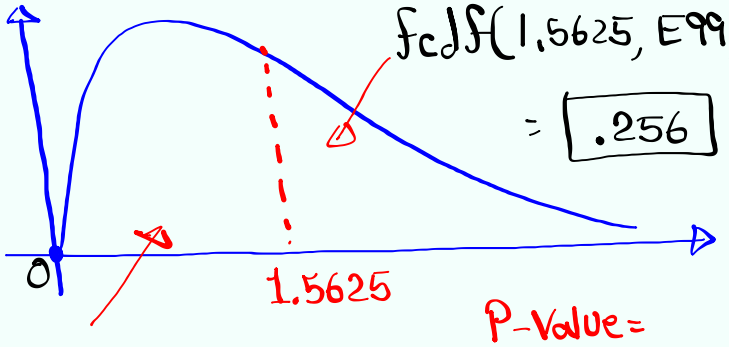
Invalid claim

Reject the claim

Jun 4-1:57 PM

CTS $F=1.5625$ $NdF=11$ $DdF=9$

TTT Find p-value.



fcdf(1.5625, E99, 11, 9)

= .256

fcdf(0, 1.5625, 11, 9) = .744

P-Value =

2. Smaller one =

2(.256) = .512

Jun 4-2:06 PM

Chart below shows ages of randomly selected nurses in different hospitals.

L1 USC			L2 UCLA			L3 LA General			L4 UCI Medical		
32	38	45	28	33	48	46	52	60	29	32	35
29	36	40		30	35		45	55	25	40	36
	48	50						58			

No $\alpha \to .05$

Test the claim that all means are the Same.

$K=4$ $Ndf = K-1=3$

$n=25$ $Ddf = n-K=21$

CTS $F=10.097$

P-Value $P = 2.5\times10^{-4}$

$H_0: \mu_1=\mu_2=\mu_3=\mu_4$ claim

H_1: At least one is different RTT

ANOVA(L1,L2,L3,L4)

P-Value $<$ α

2.5×10^{-4} $.05$

H_0 invalid → Invalid claim

H_1 Valid Reject the claim

Jun 4-2:11 PM

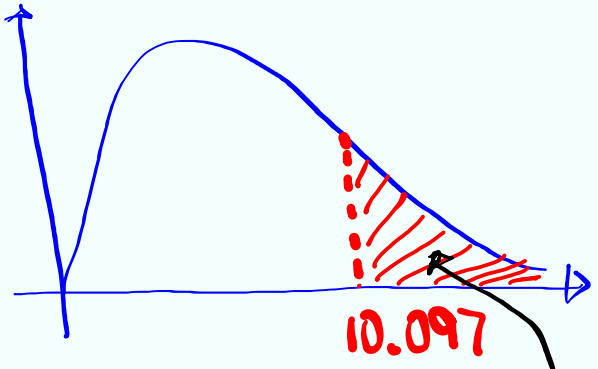
Ndf = 3

Ddf = 21

CTS F=10.097

RTT

Find P-Value



P-Value = Area

fcdf(10.097,E99,3,21)

$= 2.5\times10^{-4}$

Jun 4-2:23 PM