Statistics

Lecture 25

Feb 19-8:47 AM

LA Times claims that the mean age of all nurses in LA county is 48 yrs.

$\mu = 48$

In a Sample of 20 nurses, their mean age was 45 yrs with standard deviation of 8.

Use $\alpha = .02$ to test the claim.

$n = 20$

$\bar{x} = 45$

$S = 8$

$H_0: \mu = 48$ claim

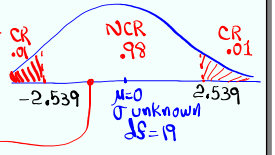
$H_1: \mu \neq 48$ TTT

σ unknown

CV t TTT $\alpha = .02$

$df = n - 1 = 19$

$t = invT(.99, 19)$



CTS $t = -1.677$

P-value $P = .110$

T-Test

inpt: Stats

$\mu_0 = 48$ H_0

$\bar{x} = 45$

$S = 8$

$n = 20$

$\mu \neq \mu_0$ H_1

Calculate

CTS is in NCR

P-value $> \alpha$

H_0 valid, H_1 invalid

valid claim

FTR the claim

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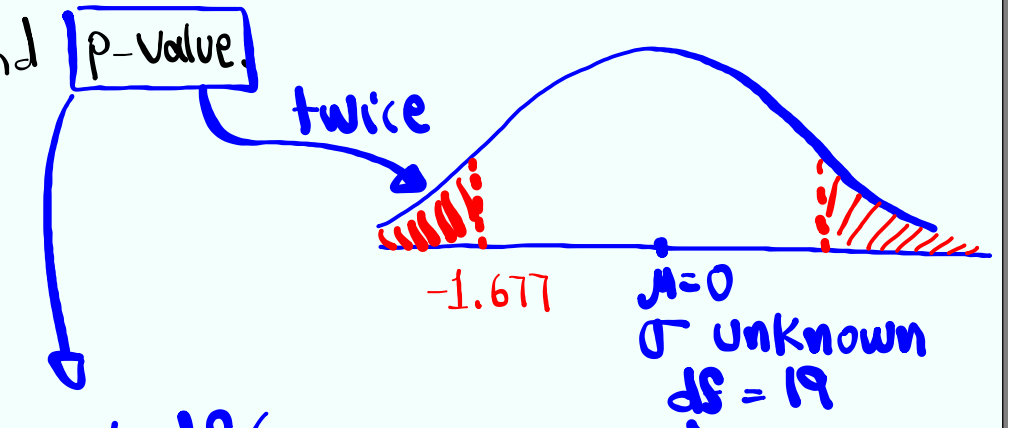
Given CTS $t = -1.677$ $df = 19$ TTT

Find p-value.



$2 \cdot tcdf(-E99, -1.677, 19)$

$= .110$

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Testing one population standard deviation:

$H_0: \sigma = \sigma_0$	$H_0: \sigma \geq \sigma_0$	$H_0: \sigma \leq \sigma_0$
$H_1: \sigma \neq \sigma_0$	$H_1: \sigma < \sigma_0$	$H_1: \sigma > \sigma_0$
TTT	LTT	RTT

Use P-value Method:

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

P-value → χ^2cdf

1) RTT $\chi^2cdf(CTS, E99, df)$

2) LTT $\chi^2cdf(0, CTS, df)$

3) TTT Find area on both sides of CTS

P-value = 2(Smaller area)

Proceed with testing chart (P-value Method)

Draw final conclusion about the claim.

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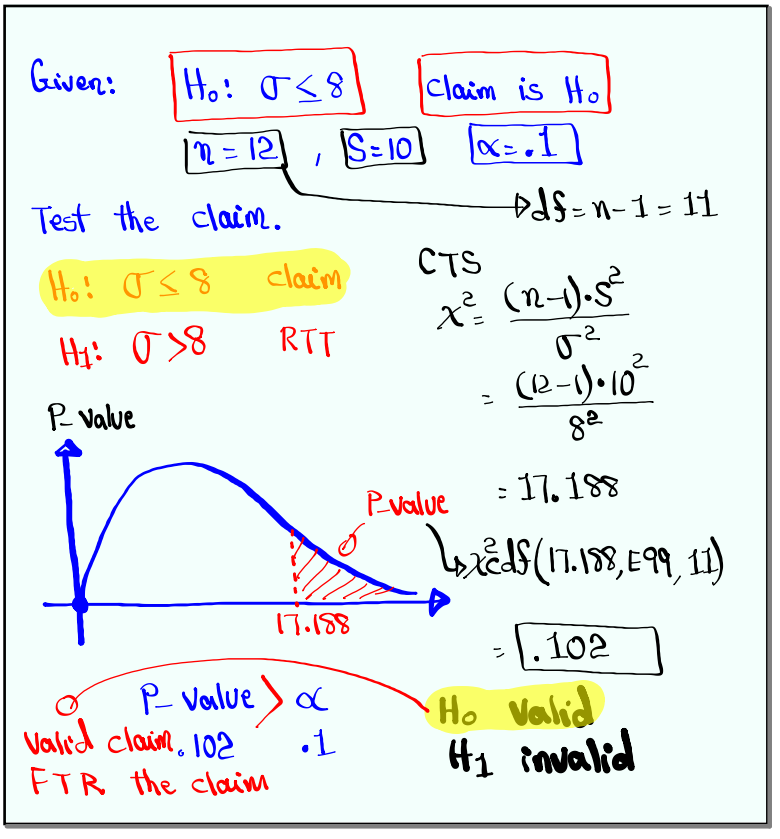

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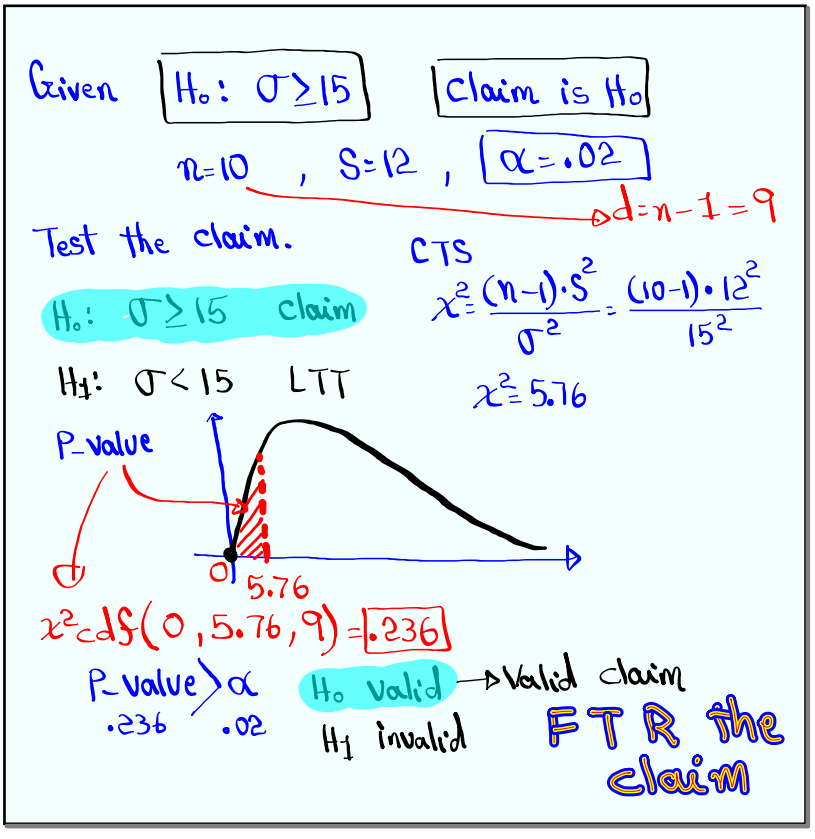

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I claim standard deviation of ages of all students is 8 Yrs. $\sigma = 8$

A Sample of 15 students, standard dev. of their ages was 10 Yrs. $n = 15$, $s = 10$, $df = n-1 = 14$

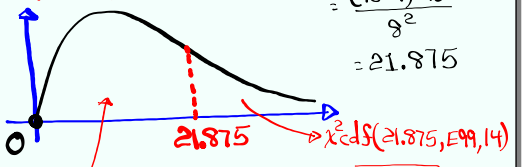
No $\alpha \rightarrow .05$

Test the claim.

CTS $\chi^2 = \frac{(n-1)\cdot s^2}{\sigma^2} = \frac{(15-1)\cdot 10^2}{8^2} = 21.875$

H_0: $\sigma = 8$ claim

H_1: $\sigma \neq 8$ TTT



$\chi^2cdf(21.875, E99, 14)$

$\chi^2cdf(0, 21.875, 14) = .919$ $= .081$

P-value $= 2(.081) = .162$

P-Value $> \alpha$

.162 .05

H_0 Valid, H_1 invalid

Valid claim

FTR the claim

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