Statistics Final Exam Review

Feb 19-8:47 AM

S6 35

Randomly selected exams.

Here are the Scores

L1 Mornings			L2 Afternoon			L3 online		
78	83	90	76	80	88	90	100	92
70	85	68	58	68	78	88	100	95
	92							

$K = 3$ $\quad ndf = K-1 = 2$

$n = 7+6+6 = 19$ $\quad Ddf = n-K = 16$

Test the claim that All pop. means are the Same. → NO α → Use .05

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

H_1: At least one mean is different. RTT

Since we are comparing at least 3 pop. means, we use ANOVA.

STAT → TESTS → ANOVA(L1, L2, L3) → Enter

CTS F = 8.039

P-Value P = .004

P-value $\leq \alpha$ → .004 ≤ .05

H_0 invalid → Invalid claim → Reject the claim

H_1 valid

If we choose α to be .003, .002, .001, then P-value $> \alpha$ → H_0 valid → Valid claim → FTR the claim.

H_1 invalid

Dec 9-12:14 PM

CTS $F = 8.039$

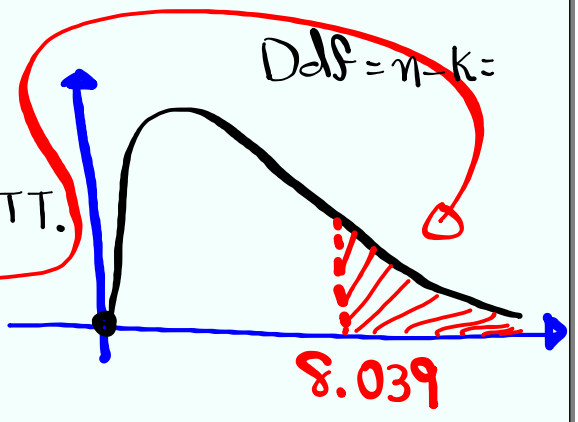
$K = 3$, $n = 19$

ANOVA is always RTT.

Find P-Value.

$Ndf = K - 1 = 2$

$Ddf = n - K =$



$\rightarrow$ fcdf(8.039, E99, 2, 16)

$= .004$

Dec 9-12:27 PM

SG 31

Consider the chart below

Sample 1	Sample 2
$n_1 = 7$	$n_2 = 10$
$S_1 = 9$	$S_2 = 6$

1) Verify $S_1 > S_2$ ✓

2) $Ndf = n_1 - 1 = 6$

$Ddf = n_2 - 1 = 9$

3) CTS $F = \frac{S_1^2}{S_2^2} = \frac{9^2}{6^2} = 2.25$

4) Test the claim using $\alpha = .1$ that there is a difference between two Pop. standard deviations.

$H_0: \sigma_1 = \sigma_2$

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

CTS $F = 2.25$

P-value $P = .264$ ✓

2-SampFTest

P-value $>$ α

.264 .1

H_0 valid

H_1 invalid $\rightarrow$ Invalid claim

Reject the claim.

If α is .27, .28, .29, ...

P-value $\leq \alpha \rightarrow H_0$ invalid

H_1 valid $\rightarrow$ Valid claim $\rightarrow$ FTR the claim

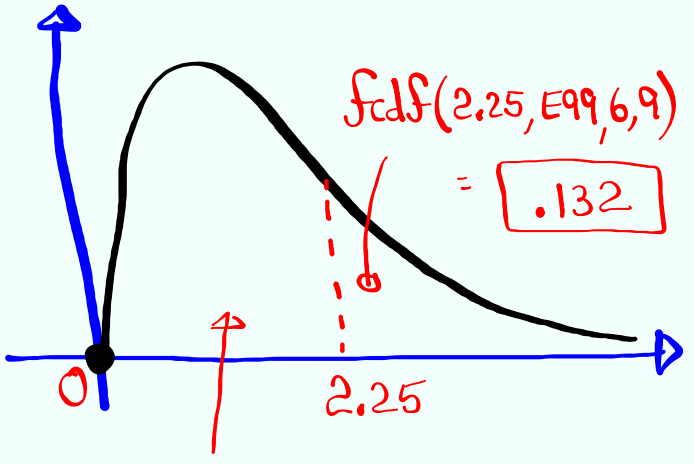
Dec 9-12:31 PM

CTS $F = 2.25$

$Ndf = 6$

$Ddf = 9$

TTT



Find p-value.

fcdf(0, 2.25, 6, 9) = .868

↳ 2 · Smaller area = 2(.132) = .264

Dec 9-12:43 PM

Given $n = 10$, $S = 15$, $\alpha = .01$ (SG 27)

Test the claim that pop. standard deviation is at most 12.

$\sigma \leq 12$.

H_0

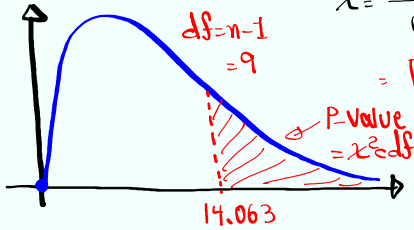
H_0: $\sigma \leq 12$ claim

H_1: $\sigma > 12$ RTT

CTS

$\chi^2 = \frac{(n-1)\cdot s^2}{\sigma^2} = \frac{(10-1)\cdot 15^2}{12^2}$

= 14.063



= .120

P-value > α

.120 .01

H_0 valid → valid claim

H_1 invalid FTR the claim

If we choose $\alpha = .13, .14, .15, .16, \ldots$

P-value ≤ α

H_0 invalid → Invalid claim

H_1 valid Reject

Dec 9-12:49 PM

exam 3 #15

binomial Prob. dist.

$p = .8$

$n = 50$

$P(x < 40) = P(x \leq 39)$

$= \text{binomcdf}(50, .8, 39)$

$=$ [ ]

Dec 9-1:01 PM

500 Tickets Sold at $1 each.

One ticket randomly Selected

that is the winning TKT → owner gets $100.

Find expected Value per ticket Sold.

L1 Net	L2 P(Net)	
1 − 100	1/500	winning TKT
1 − 0	499/500	losing TKTS

E.V. $= \mu = \bar{x}$

1-Var stats

List: L1

FreqList: L2

E.V. $= \mu = \bar{x} = .8$

80¢/TKT

Dec 9-1:03 PM

Exam 2 # 11

$P(A) = .5$ $P(B) = .4$ Find $P(A \text{ or } B)$

a) if A & B are disjointed events.

$P(A \text{ and } B) = 0$

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$= .5 + .4 - 0 = \boxed{.9}$

b) If A & B are independent events.

$P(A \text{ and } B) = P(A) \cdot P(B)$

$= (.5)(.4) = .2$

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$= .5 + .4 - .2 = \boxed{.7}$

Dec 9-1:11 PM