

Statistics

Lecture 20



Feb 19-8:47 AM

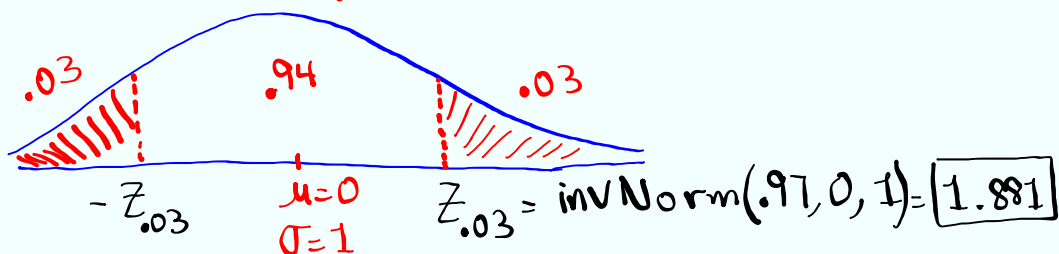
1) Find $Z_{.03}$

SG 21
Review

Area of right Tail
 $\alpha/2 = .03 \rightarrow \alpha = .06$ Sig. level

$1 - \alpha = .94$ Middle Area

$.94 = 94\%$ C-level



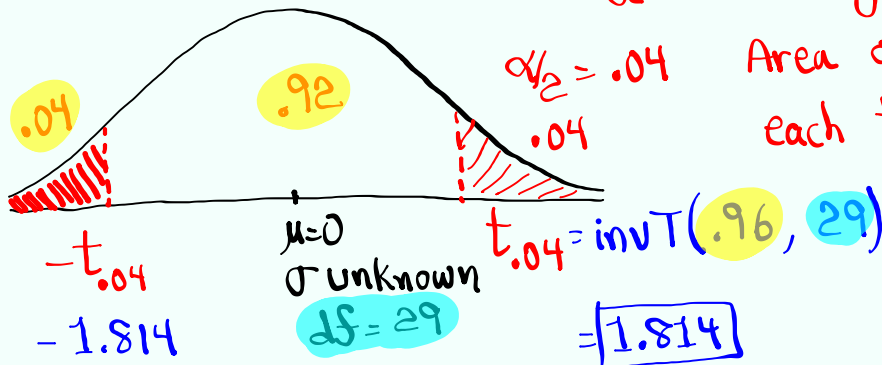
Nov 12-10:36 AM

find $\pm t_{\alpha/2}$ for 92% C-level with $df=29$.
 middle Area = .92

$$1 - \alpha = .92$$

$$\alpha = .08 \text{ Sig. level}$$

$$\alpha/2 = .04 \text{ Area of each tail}$$



Nov 12-10:40 AM

Consider the confidence interval $.24 < p < .42$
 at 90% C-level.

1) Explain it in simple language.

we are 90% confident the the Pop. Prop.
 falls with 24% & 42%.

$$2) E = \frac{.42 - .24}{2} = \frac{.18}{2} = .09$$

$$3) \hat{p} = \frac{.42 + .24}{2} = \frac{.66}{2} = .33$$

Nov 12-10:45 AM

I randomly selected 482 students and 32% of them were fan of online classes.

$$n = 482 \quad x = n\hat{p} = 482(.32) = 154.24 \Rightarrow \boxed{x=155}$$

$\hat{p} = .32$ if decimal $\rightarrow$ Round-up.

Find NO C-level $\rightarrow .95$ Conf. interval for the prop. of all students that are fan of online classes.

1-Prop Z Int

$x: 155$

$n: 482$

C-level: .95

Calculate

$$E = \frac{.36 - .28}{2} = \boxed{.04}$$

$$\boxed{.28 < P < .36}$$

we are 95% confident that between 28% & 36% of all students are fan of online classes.

$$\hat{p} = \frac{.36 + .28}{2} = \boxed{.32}$$

Nov 12-10:49 AM

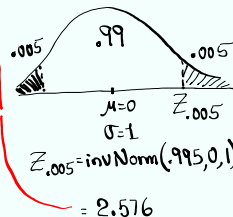
If we wish to construct 99% Conf. interval for the prop. of all students that are fan of online classes, find the min. Sample Size needed if error cannot exceed 5%.

$$n = \hat{p}\hat{q} \left(\frac{Z_{\alpha/2}}{E} \right)^2$$

$$= (.32)(.68) \left(\frac{2.576}{.05} \right)^2$$

$$= 577.577943$$

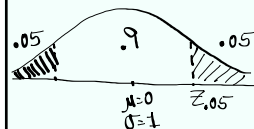
$$\approx \boxed{578}$$



Suppose $\hat{p}$ & $\hat{q}$ are unknown, and C-level is 90%.

$$n = .25 \left(\frac{Z_{\alpha/2}}{E} \right)^2 = .25 \left(\frac{1.645}{.05} \right)^2 = 270.6025$$

$$\approx \boxed{271}$$



$$Z_{.05} = \text{invNorm}(.95, 0, 1) = \boxed{1.645}$$

SG 21✓

Nov 12-10:58 AM