Eale...

Stat 312

NOTES

= .1 ... $\pi \neq .15$

/102 ... $\alpha = .05$

.1275 ... extreme, both ... sides,

75) ... $(Z \le \frac{.1275 - .15}{\sqrt{\frac{.15(1-.15)}{102}}}$ ...

$\frac{-.0175}{\sqrt{.001...}}$ ... $Z \le -.4977$ ... 2

= p ... 2·P(...) =

st(x= ... p=.15, alternative

= .95 ... 102, p-value = 2. .6767

95% CI ... (.0696,

95

± (... $\hat{\pi}$ ... $-\hat{\pi})$

=

± $(Z_{.025})$ ... $\sqrt{(.1275 ...}$

.1275 ... .1275

(.1124)

.19223 ... $\alpha = .05$ ... 95%

... assume

answ... not

CI.

cont. for C.I. part

4

NOTES — IGNORE

Gamma ... dist: $F(x; \alpha, \beta) = F\left(\frac{x}{\beta}; \alpha\right)$

$P(X \le x)$ ... χ^2 ... w/ $\alpha = \nu/2$, $\beta = 2$ $\quad \nu = df = n-1$

Chi-squared (gamma) ... $df = n-1$ → from Normal dist. pop

$\frac{\sum (X_i - \bar{X})^2}{\sigma^2}$ ... (area to right)

... = 1 − α

critical value ... $\chi^2_{\alpha/2, n-1}$ ... pop:

$\frac{(n-1)S^2}{\sigma^2}$ ... normal ...

σ^2 for ... each listed above

$(n-1)s^2 / \chi^2_{\alpha/2, n-1}$ ... corresponding ...

$(n-1)s^2 / \chi^2_{1-\alpha/2}$ ... of ...

take ... sqrt ...

one-sided ... α/2

w/ α, ...

44. n ...

α = .05

... tails)

σ ... $= 63.1688 / 17.535 = 3.6024$

$= 63.1688 / 2.180 = 28.9765$

$(9-1)(2.81)^2 / \chi^2_{(.025), 8}$ ... for (σ^2)

$(9-1)(2.81)^2 / \chi^2_{(.975), 8}$

$(3.602, 28.97)$

σ ... $= (\sqrt{3.6024}) = 1.898$

$= (\sqrt{28.9765}) = 5.383$

for (σ)

$(n-1)s^2 / \chi^2_{(.025), 8}$

$(n-1)s^2 / \chi^2_{(.975), 8}$

$(1.898, 5.383)$

if ... then ... i.e. $X \approx N(n\pi, \sqrt{n\pi(1-\pi)})$

$n(1-\pi) \ge 15$ ...

$\begin{cases} \mu = n\pi \\ \sigma = \sqrt{n\pi(1-\pi)} \end{cases}$ ... population proportion: ... ($n\pi \ge 15$, $n \ge 30$)

$\hat{\pi} = \frac{X}{n}$ ... for ... C.I. ... $\pm (z_{\alpha/2}) \left(\sqrt{\frac{\hat{\pi}(1-\hat{\pi})}{n}}\right)$

$\hat{\pi} = \frac{x}{n}$

//NOTES - Ignore

Proportions:

Large sample tests

Null hyp: $H_0: \pi = \pi_0$

Test statistic: $z = \dfrac{\hat{\pi} - \pi_0}{\sqrt{\pi_0(1-\pi_0)/n}}$

H_a	p value
$H_a: p > p_0$	area to right of z
$H_a: p < p_0$	area to left of z
$H_a: p \neq p_0$	2(area to right of $\lvert z \rvert$)

15. p350: (2.45)

$H_0: \pi = .4$

$n = 150$ $\alpha = 0.01$

$n \geq 30$ ✓ $n\pi_0 \geq 15$? → $n(1-\pi_0) \geq 15$?

P($\hat{\pi}_0$ extreme or more extreme

$2 \cdot P(\hat{\pi} \geq .546 \ldots Z) = 2 \cdot (1 - P(Z \leq \frac{.5467 - .4}{\sqrt{.4(1-.4)/150}}$

$2 \cdot (1 - P(Z \leq \frac{.1467}{\sqrt{.0016}}))$

$2(.99 \ldots 874) = 2(.000126)$

Since $p << \alpha = .01$, we ... that there exists a stat. ... between $\hat{\pi}$ and π_0 ... so reject H_0 in favor of H_a ... $\alpha = .05$ as well. ... actual percentage of the ... significantly diff. than 40

7.

a) H

F

=

b)

1. n

a)

b)

F

=

$\hat{\pi}$

$\alpha = 0.$

version)

) /

.02))

/ $-P(Z$

s ins

and

t $\alpha =$

reject

it

ma

at

we

tr

) =

$(1-\pi)$

) &

P(

$\frac{-.017}{\sqrt{.0}}$

$\frac{.01333}{\sqrt{(.01333)(1-.01333)/800}}$

9495)

reject Ho

ject (retain)

sample)

truth),

or.

5)

T3