DAD I, PARTIAL 2 TYPE A, JUNE 2015

EXERCISE 1

$S = 15$

$n = 145$

$\bar{X} = 100$

LC 95% → $z = 1.96$

lesson 6, slides 6 and 7

a. $\boxed{E = z_{\alpha/2} \cdot \sigma_{\bar{X}}} = 1.96 \cdot 1.25 = 2.45$

$$\boxed{\sigma_{\bar{x}} = \frac{S}{\sqrt{n-1}}} = \frac{15}{\sqrt{145-1}} = \frac{15}{12} = 1.25$$

lesson 6, slide 7

lesson 6, slide 7

b. $\boxed{\bar{x} \pm E} = 100 \pm 2.45 \;<\; \begin{matrix} 102.45 \\ 97.55 \end{matrix}$

EXERCISE 2

$\pi = 0,33$

$p = \frac{90}{250} = 0.36$

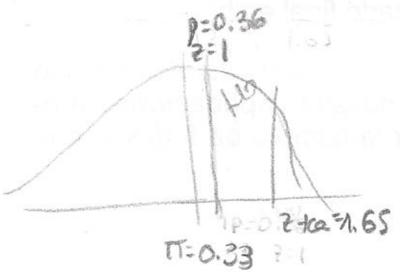
$\alpha = 0.1 \rightarrow z = 1.65$

$H_0: \pi = p$

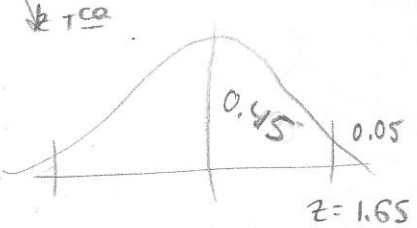
$$z = \frac{p - \pi}{\sigma_p} = \frac{0.36 - 0.33}{0'03} = \frac{0.03}{0.03} = 1$$

$$\sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}} = \sqrt{\frac{0.33(1-0.33)}{250}} = 0'03$$

$$= \sqrt{\frac{0,33 \cdot 0,67}{250}} = \sqrt{\frac{0.2211}{250}} = \sqrt{0.0008} = 0,03$$



z tca



$0.5 - 0.05 = 0.45$

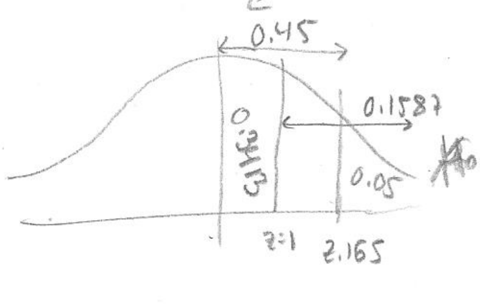
Conclusion with z:1

$z_{emp} = 1 < z_{tca} = 1.65$ — Ho

The planned percentage (33%) was statistically maintained

Conclusion with sig:

$0,1587 \cdot 2 = 0.3174$



p	$>$	α	— Ho
0.3174		0.1	

- From a statistical point of view, and with a 10% of probability of being wrong when rejecting the null hypothesis, 33% and 36% are equal

2015 JUNE PARTIAL 2
SEPTEMBER 2014, PARTIAL 2

- Independent samples
- Nominal and ordinal vble
- Assumptions: - $N > 20$
  - $E \geq 5$ in at least 20% of cells (in 100%)

ex 24

χ^2

Exercise 3 A total of 210 emphysema patients entering a clinic over a 1-year period were treated with one of two drugs (either the standard drug, A, or an experimental compound, B) for a period of 1 week. After this period, each patient's condition was rated as greatly improved, improved, or no change. The sample results are shown below.

$\frac{100 \cdot 35}{210}$

Patient's Condition

Therapy	No Change	Improved	Greatly Improved	
A	20 (16.67)	35 (38.09)	45 (45.24)	100
B	15 (18.33)	45 (41.9)	50 (49.76)	110
	35	80	95	210

Perform a chi-square test of independence. Use level of significance $\alpha = .05$.

$$\chi^2 = \Sigma \frac{(O-E)^2}{E} = \frac{(20-16.67)^2}{16.67} + \frac{(15-18.33)^2}{18.33} + \frac{(35-38.09)^2}{38.09} + \frac{(45-41.9)^2}{41.9} +$$

$$+ \frac{(45-45.24)^2}{45.24} + \frac{(50-49.76)^2}{49.76} = \frac{3.33^2}{16.67} + \frac{(-3.33)^2}{18.33} + \frac{(-3.09)^2}{38.09} +$$

$$+ \frac{3.1^2}{41.9} + \frac{(-0.24)^2}{45.24} + \frac{0.24^2}{49.76} = \frac{11.09}{16.67} + \frac{11.09}{18.33} + \frac{9.55}{38.09} +$$

$$+ \frac{9.61}{41.9} + \frac{0.06}{45.24} + \frac{0.06}{49.76} = 0.66 + 0.6 + 0.25 + 0.23 + 0.001 + 0.001 =$$

$$= 1.742$$

$df = (\text{rows} - 1) \times (\text{colums} - 1) = (2-1) \cdot (3-1) = 1 \cdot 2 = 2$

$\chi^2_{(0.05,\, 2)} = 5.99$

$\chi^2 \quad \chi^2_t$

$1.74 < 5.99$ — Ho There are not differences between treatments A and B (one drug is not better than the other with a 95% of level of confidence)

EXERCISE 4

sig α

(a)

- $0.019 < 0.05$ —— ~~H0~~ There is statistically significant relationship

(marked with asterisk)

(b) $r^2 = 0.37^2 = 0.14 < 0.18$ → Low effect size

NO, because the statistical significance can be due to an excessively high statistical power.

(c)

$1 - CD = 1 - r^2 = 1 - 0.14 = 0.86$

86% of the variability of Y (height) is not explained by X (weight)