this time: two-sample problems

next time: correlation & regression

read: LN pp L-(207)-(244)

homework 3 (reader pp. R-(63) → R-(65))

has 4 problems & is due Mon 18 Jul in class

you can fill out your online evaluation of ours through anyway starting tomorrow (14 Jul) & ending Fri 22 Jul

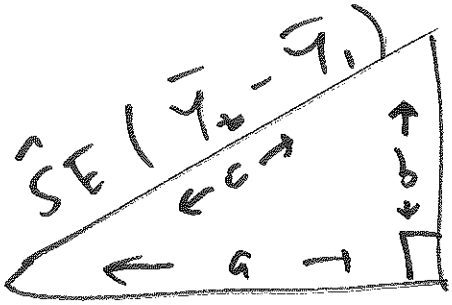
today LN pp L-(186) →

$\hat{SE}(\bar{Y}_1) = \frac{s_1}{\sqrt{n_1}} = 0.2685$ (9.42) 10.46

$\hat{SE}(\bar{Y}_2) = \frac{s_2}{\sqrt{n_2}} = 0.2419$

can't be less than (0.2419) + (0.2685)

$\hat{SE}(\bar{Y}_2 - \bar{Y}_1) = ?$ has to be bigger than 0.2419 & 0.2685



$\hat{SE}(\bar{Y}_2) = (0.2419)$

$\hat{SE}(\bar{Y}_1) = (0.2685)$

math fact

$a^2 + b^2 = c^2$

$c = \sqrt{a^2 + b^2}$

$$\hat{SE}(\bar{Y}_2 - \bar{Y}_1) = \sqrt{\left[\hat{SE}(\bar{Y}_2)\right]^2 + \left[\hat{SE}(\bar{Y}_1)\right]^2}$$

$$= \hat{SE}(\bar{Y}_1 - \bar{Y}_2)$$

here

$$\hat{SE}(\bar{Y}_2 - \bar{Y}_1) = \sqrt{(0.2685)^2 + (0.2419)^2}$$

$$= 0.3614 \text{ days}$$

$$\hat{SE}(\bar{Y}_2 - \bar{Y}_1) = \hat{SE}(\bar{Y}_1 - \bar{Y}_2)$$

$$= \sqrt{\left(\frac{S_2}{\sqrt{n_2}}\right)^2 + \left(\frac{S_1}{\sqrt{n_1}}\right)^2} = \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$$

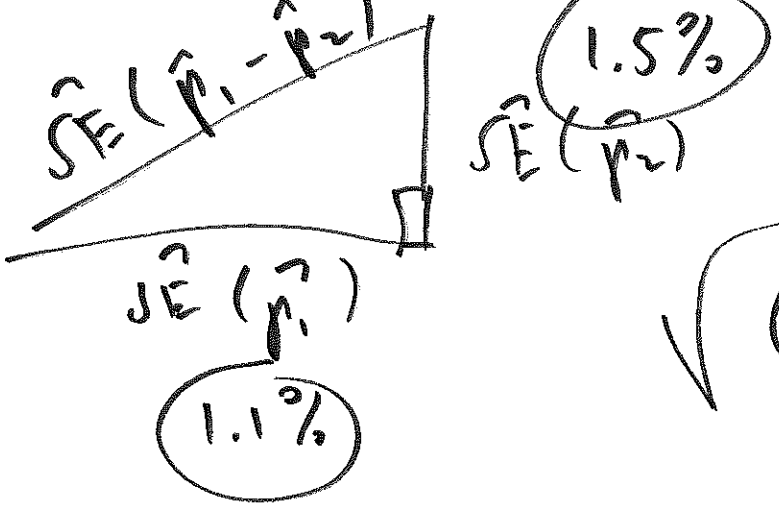
$$\widehat{SE}(\hat{p}_1) = \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1}} = \sqrt{\frac{(0.034)(0.966)}{265}}$$

$$\approx 0.0111 \doteq 1.1\%$$

$$\widehat{SE}(\hat{p}_2) = \sqrt{\frac{\hat{p}_2(1-\hat{p}_2)}{n_2}} = \sqrt{\frac{(0.071)(0.929)}{281}}$$

$$= 0.0153 \doteq 1.5\%$$

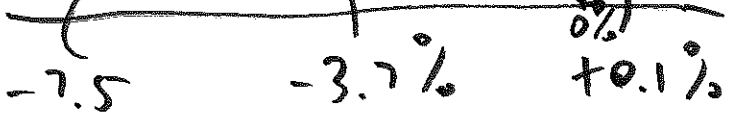
$\widehat{SE}(\hat{p}_1 - \hat{p}_2) = ?$



$$\widehat{SE}(\hat{p}_1 - \hat{p}_2) = \sqrt{(0.0111)^2 + (0.0153)^2}$$

$$= 0.0186 \doteq 1.9\%$$

95% int for $(p_1 - p_2)$



$$\widehat{SE}(\hat{p}_1 - \hat{p}_2) = \sqrt{\left(\widehat{SE}(\hat{p}_1)\right)^2 + \left[\widehat{SE}(\hat{p}_2)\right]^2} \quad (4)$$

$$= \sqrt{\left(\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1}}\right)^2 + \left(\sqrt{\frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}\right)^2}$$

$$= \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$