$$t_{obs} = \frac{\mu_D - A_D}{\sigma_D / \sqrt{n}}$$

Setter inn verdiene

$$t_{obs} = \frac{-3{,}26 - 0}{8.81/\sqrt{31}} = -2{,}06$$

Dermed trenger vi P til å sammenligne med $\alpha = 0{,}05$

$$P = 2\,P(t_{n-1} \geq t_{obs})$$

Setter inn verdiene

$$P = 2\,P(t_{30} \geq -2{,}06)$$

$$\overset{\text{"r"}}{=} 0{,}046$$

Dermed har vi $P < \alpha$ så vi forkaster H_0

#

2 c)

For å finne 95 % CI for μ_D bruker jeg

$$\mu \pm t_{\alpha/2, n-1} \frac{s}{\sqrt{n}}$$

Setter inn tall og får

$$-3,26 \pm -2.04 \cdot \frac{8.81}{5,57}$$

"r"

$$= [-6.49, -0,028]$$

3

Vi skal finne $\hat{\beta}_0 + \hat{\beta}_1 x$

Vi finner β_1 ved

$$\hat{\beta}_1 = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2} = \frac{S_{xy}}{S_{xx}} \quad (12,2)$$

$$\hat{\beta}_0 = \frac{\sum y_i - \hat{\beta}_1 \sum x_i}{n} = \hat{y} - \beta_1 \bar{x} \quad (12.3)$$

$CI = \hat{\beta}_1 \pm t_{\alpha/2, n-2} \cdot s_G$

Setter vi i inn fall får vi

$= 0,247 \pm -2,306 \cdot 0,048$

$= [0.020 \quad , \quad 0,4743]$

$$t_{obs} = \frac{|\bar{x}_1 - \bar{x}_2| - \overbrace{|\mu_1 - \mu_2|}^{=0 \text{ pga } H_0}}{\sqrt{s_p\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Setter vi inn fall får vi (Regnet i "r"

2,59

$t_{lim} = t_{(1-\alpha/2, n-1)}$

gir oss

$t_{lim} = 2,26$

Dvs $t_{lim} < t_{obs}$, som vil si at det er en signifikant forskjell. P.G.A vi forkaster H_0

Vi kan finne CI ved

setter for ryddighetenskyld

$$t_{\alpha/2,\, n_x+n_y-2} = t$$

$$1-\alpha = P\left(-t < \frac{\bar{X}-\bar{Y}-(\mu_x-\mu_y)}{\sqrt{S_p\left(\frac{1}{n_x}+\frac{1}{n_y}\right)}} < t\right)$$

Løser m.h.p. $\mu_x - \mu_y$

setter $\mu_x - \mu_y = \mu_D$,

$$1-\alpha = P\left(-t < \frac{\bar{X}-\bar{Y}-\mu_D}{\left(S_p\left(\frac{1}{n_x}+\frac{1}{n_y}\right)\right)^{1/2}} < t\right)$$

$$= P\left(-t\sqrt{S_p\left(\frac{1}{n_x}+\frac{1}{n_y}\right)} < \bar{X}-\bar{Y}-\mu_D < t\sqrt{S_p\left(1/n_x + 1/n_y\right)}\right)$$

$$= P\left(\bar{X}-\bar{Y}-t\sqrt{S_p(1/n_x+1/n_y)} < \mu_D < \bar{X}-\bar{Y}+t\sqrt{S_p\left(1/n_x+1/n_y\right)}\right)$$

Dermed har vi et CI for $\mu_D = \mu_x - \mu_y$

$$\bar{X}-\bar{Y} \pm t_{\alpha/2,\, n_x+n_y-2}\sqrt{S_p\ 1/n_x + 1/n_y}$$

Setter vi inn verdiene får vi ("r")

$$[0.062,\ 0{,}598]$$

$$t_{obs} = \frac{|\bar{x}_1 - \bar{x}_2| - |\mu_1 - \mu_2|}{\frac{(s_1^2/n_1)^2}{n_1 - 1} + \frac{(s_2^2/n_2)^2}{n_2 - 1}}$$

$$n - 1 = \frac{(s_x^2/n_x + s_y^2/n_y)^2}{\frac{(s_x^2/n_x)^2}{n_x - 1} + \frac{(s_y^2/n_y)^2}{n_y - 1}}$$