Solution TD 1

Exercice 2

On a

$$IC:\ a_1 \in \left[\hat{a}_1 - t_{n-2}^{\alpha/2} \times \hat{\sigma}_{\hat{a}_1}\ ;\ \hat{a}_1 + t_{n-2}^{\alpha/2} \times \hat{\sigma}_{\hat{a}_1} \right]$$

Calcul de $\hat{\sigma}_{\hat{a}_1}$ et $\hat{a}_1$:

On a

$$\mathrm{F}^* = \left(t_{\hat{a}_1}^*\right)^2 = \left(\frac{\hat{a}_1}{\hat{\sigma}_{\hat{a}_1}}\right)^2 = \frac{\frac{R^2}{1}}{\frac{1-R^2}{n-2}} = \frac{\frac{r_{x,y}^2}{1}}{\frac{1-r_{x,y}^2}{n-2}} = 27.36$$

avec

$$r_{x,y}^2 = \frac{\left[\sum_{i=1}^{n} x_i y_i - n \times \overline{x} \times \overline{y}\right]^2}{\left[\sum_{i=1}^{n} x_i^2 - n \times \overline{x}^2\right] \times \left[\sum_{i=1}^{n} y_i^2 - n \times \overline{y}^2\right]}$$

$$= \frac{\left[184500 - 6 \times 400 \times 60\right]^2}{\left[1400000 - 7 \times 400^2\right] \times \left[26350 - 7 \times 60^2\right]} = 0.8455$$

et

$$\hat{a}_1 = \frac{\sum_{i=1}^{n} x_i y_i - n \times \overline{x} \times \overline{y}}{\sum_{i=1}^{n} x_i^2 - n \times \overline{x}^2} = \frac{184500 - 7 \times 400 \times 60}{1400000 - 7 \times 400^2} = 0.0589$$

alors $\hat{\sigma}_{\hat{a}_1} = \sqrt{\dfrac{\left(\hat{a}_1\right)^2}{\mathrm{F}^*}} = 0.0113$

$$IC = \left[0.0589 - 2,365 \times 0.0113\ ;\ 0.0589 + 2,365 \times 0.0113\ \right] = \left[0.0322\ ;\ 0.0856\right]$$