

## Corrige -type

Exercice 01 **6,5**

$$N_1 = 100. \quad \bar{x}_1 = 80. \quad v_{e_1} = 25. \quad N_2 = 90. \quad \bar{x}_2 = 81. \quad v_{e_2} = 22,25.$$

$$1. \begin{cases} H_0: \mu_1 = \mu_2 \\ H_1: \mu_1 \neq \mu_2 \end{cases}$$

$$2. \alpha = 0,05.$$

3. Test T : Comparaison entre deux moyennes

4.  $\sigma_1$  et  $\sigma_2$  sont inconnus,  $N_1, N_2 \geq 30$  et  $\sigma_1 = \sigma_2$

$$\varepsilon_{\text{cal}} = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\frac{(\hat{\sigma}_{e_1})^2}{N_1} + \frac{(\hat{\sigma}_{e_2})^2}{N_2}}}$$

$$\sigma_{e_1} = \sqrt{v_{e_1}} = \sqrt{25} = 5$$

$$\sigma_{e_2} = \sqrt{v_{e_2}} = \sqrt{20,25} = 4,5$$

$$\hat{\sigma}_{e_1} = \sqrt{\frac{N_1}{N_1-1}} \times \sigma_{e_1} = \sqrt{\frac{100}{99}} \times 5 = 5,025 \Rightarrow (\hat{\sigma}_{e_1})^2 = 25,52.$$

$$\hat{\sigma}_{e_2} = \sqrt{\frac{N_2}{N_2-1}} \times \sigma_{e_2} = \sqrt{\frac{90}{89}} \times 4,5 = 4,525 \Rightarrow (\hat{\sigma}_{e_2})^2 = 20,475.$$

$$\varepsilon_{\text{cal}} = \frac{|80 - 81|}{\sqrt{\frac{25,52}{100} + \frac{20,475}{90}}} = 1,44.$$

5.  $\varepsilon_{\text{cal}} < \varepsilon_{0,01} \Rightarrow H_0$  est **acceptée**.

Exercice 02 **6**

$$N_1 = 8. \quad \sum x = 22,39. \quad \sum y = 78,3. \quad \sum xy = 224,627. \quad \sum x^2 = 63,61.$$

$$\hat{y} = a + bx$$

$$b = \frac{N \sum xy - \sum x \sum y}{N \sum x^2 - (\sum x)^2} = 8,39$$

$$a = \frac{\sum y - b \sum x}{n} = -13,71.$$

$$\hat{y} = -13,71 + 8,39x.$$

**Exercice 03** 6,5

$$N_1 = 5. \quad N_2 = 5. \quad N_3 = 5. \quad N = 15. \quad K = 2.$$

$$\sum x_{E_1} = 121,9. \quad \sum x_{E_2} = 107,4. \quad \sum x_{E_3} = 117,6.$$

$$\sum x_{E_1}^2 = 2973,51. \quad \sum x_{E_2}^2 = 2316,92. \quad \sum x_{E_3}^2 = 2768,6.$$

1.  $\begin{cases} H_0: \mu_1 = \mu_2 = \mu_3 \\ H_1: \text{Les } \mu_i \text{ ne sont pas tous égaux} \end{cases}$
2.  $\alpha = 0,05.$
3. Test : Analyse de la variance à un facteur (Anova 01).
4. Calcul de la statistique de test

$$SCT = \sum x_{E_1}^2 + \sum x_{E_2}^2 + \sum x_{E_3}^2 - \frac{(\sum x_{E_1} + \sum x_{E_2} + \sum x_{E_3})^2}{N} = 36,38.$$

$$SCF = \frac{(\sum x_{E_1})^2}{N_1} + \frac{(\sum x_{E_2})^2}{N_2} + \frac{(\sum x_{E_3})^2}{N_3} - \frac{(\sum x_{E_1} + \sum x_{E_2} + \sum x_{E_3})^2}{N} = 22,18.$$

$$SCR = SCT - SCF = 14,2.$$

**5. Tableau de variance**

S.V	S.C	D.L	M.C	$F_{Cal}$
Facteur	22,18	2	11,09	9,39
Résidus	14,2	12	1,18	
Total	36,38	14		

On a  $F_{Cal} = 9,39 > F_{(0,05;12;2)} = 3,88 \Rightarrow H_0$  est **rejetée**.

1