

Practice Exercises on ANOVA

Exercise 1. We wish to compare three treatments for asthma: treatment 2 is a new treatment, which we wish to put in competition with traditional treatments 1 and 3. Patients who come to a care center are distributed by drawing lots and assigned one of three treatments. We measure on each patient the duration, in days, separating the next asthma attack

Treatment 1	Treatment 2	Treatment 3
26, 27, 35, 36, 38 38, 41, 42, 45, 50 65	29, 42, 44, 44, 45 48, 48, 52, 56, 56 58, 58, 60, 61, 63 63, 69	26, 26, 30, 30, 33 36, 38, 38, 39, 46 47, 51, 51, 56, 75

What can we conclude?

Exercise 2. In order to evaluate the precocity of the increase in enzymatic activity during pregnancy, dosages are carried out in pregnant women at different weeks of amenorrhea. We obtain the following results (on independent samples):

4 week	5 week	6 week	7 week	8 week
7.2	4.9	10.4	4.6	6.1
4.3	4.8	4.6	5.6	11.4
5.5	4.7	8.4	8.3	8.2
4.6	5.4	6.1	6.9	5.7
4.7	4.7	8.1	4.5	6.6
5.5	4.7	5.4	4.7	6.6
6.6	6.2	6.7	6.7	6.3
5.3	5.6	7.5	4.8	5.9
5.4	3.2	6.4	5.0	5.8
3.9	6.1	5.6	5.0	4.8
5.5	6.7	6.3	5.3	9.1
2.7	5.5	7.7	7.8	13.2

Does the age of pregnancy influence the activity of the enzyme?

We give $\overline{S4} = 5.1$, $\overline{S5} = 5.208$, $\overline{S6} = 6.933$, $\overline{S7} = 5.767$, $\overline{S8} = 7.475$, $\overline{S} = 6.097$, $\sum_{i=1}^k \sum_{j=1}^{n_i} (s_{ij})^2 = 2427; 280$;

$$\sum_{i=1}^k n_i (\overline{Y_j})^2 = 2284.004.$$

Exercice 1. On souhaite comparer trois traitements contre l'asthme : le traitement 2 est un nouveau traitement, que l'on souhaite mettre en compétition avec les traitements classiques 1 et 3. On répartit par tirage au sort les patients venant consulter dans un centre de soin et on leur affecte l'un des trois traitements. On mesure sur chaque patient la durée, en jours séparant de la prochaine crise d'asthme.

Traitement1	Traitement2	Traitement3
26, 27, 35, 36, 38 38, 41, 42, 45, 50 65	29, 42, 44, 44, 45 48, 48, 52, 56, 56 58, 58, 60, 61, 63 63, 69	26, 26, 30, 30, 33 36, 38, 38, 39, 46 47, 51 51, 56 75

Que peut-on conclure?

Exercice 2. Afin d'évaluer la précocité de l'augmentation d'activité enzymatique lors de la grossesse, on pratique des dosages chez des femmes enceintes à différentes semaines d'aménorrhée. On obtient les résultats suivants (sur des échantillons indépendants): L'âge de la grossesse a-t-il une influence sur l'activité de l'enzyme ?

4Semaine	5Semaine	6Semaine	7Semaine	8Semaine
7.2	4.9	10.4	4.6	6.1
4.3	4.8	4.6	5.6	11.4
5.5	4.7	8.4	8.3	8.2
4.6	5.4	6.1	6.9	5.7
4.7	4.7	8.1	4.5	6.6
5.5	4.7	5.4	4.7	6.6
6.6	6.2	6.7	6.7	6.3
5.3	5.6	7.5	4.8	5.9
5.4	3.2	6.4	5.0	5.8
3.9	6.1	5.6	5.0	4.8
5.5	6.7	6.3	5.3	9.1
2.7	5.5	7.7	7.8	13.2

On donne: $\overline{S4} = 5.1$, $\overline{S5} = 5.208$, $\overline{S6} = 6.933$, $\overline{S7} = 5.767$, $\overline{S8} = 7.475$, $\overline{S} = 6.097$, $\sum_{i=1}^k \sum_{j=1}^{n_i} (s_{ij})^2 = 2427; 280$;

$$\sum_{i=1}^k n_i (\overline{Y_{j.}})^2 = 2284.004.$$

B. T.