

EXAM OF STATISTICS (DESCRIPTIVE STATISTICS AND REGRESSION)

Pharmacy/Biotechnology 1st year

Version A

October, 26 2020

Name:

DNI:

Group:

Duration: 1 hour.

- (4 pts.) 1. The table below shows the daily number of patients hospitalized in a hospital during the month of September.

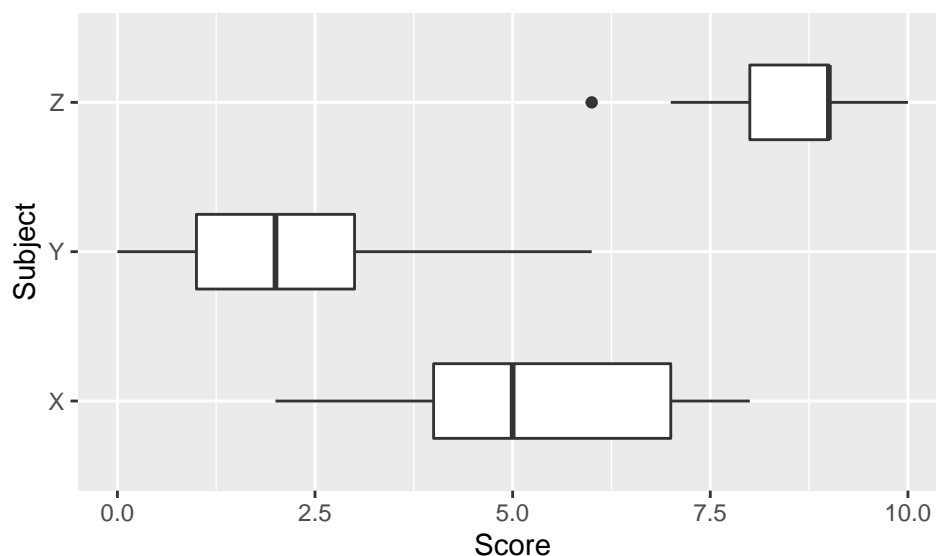
patients	Frecuencia
(10, 14]	6
(14, 18]	10
(18, 22]	7
(22, 26]	6
(26, 30]	1

- Study the spread of the 50% of central data.
- Compute the mean and study the dispersion with respect to it.
- Study the normality of the patients distribution.
- If the mean was 35 patients and the variance 40 patients² during the month of April, which month had a higher relative variability?
- Which number of people hospitalized was greater, 20 persons in September or 40 in April?

Use the following sums for the computations:

$\sum x_i n_i = 544$ patients, $\sum x_i^2 n_i = 10464$ patients², $\sum (x_i - \bar{x})^3 n_i = 736.14$ patients³ and $\sum (x_i - \bar{x})^4 n_i = 25367.44$ patients⁴.

- (1 pts.) 2. The chart below shows the distribution of scores in three subjects.



- Which subject is more difficult?

- (b) Which subject has more central dispersion?
- (c) Which subjects have outliers?
- (d) Which subject is more asymmetric?

(5 pts.) 3. In a sample of 10 families with a child older than 20 it has been measured the height of the father (X), the mother (Y) and the children (Z) in centimeters, getting the following results:

$$\begin{aligned}\sum x_i &= 1774 \text{ cm}, \sum y_i = 1630 \text{ cm}, \sum z_i = 1795 \text{ cm}, \\ \sum x_i^2 &= 315300 \text{ cm}^2, \sum y_i^2 = 266150 \text{ cm}^2, \sum z_i^2 = 322737 \text{ cm}^2, \\ \sum x_i y_i &= 289364 \text{ cm}^2, \sum x_i z_i = 318958 \text{ cm}^2, \sum y_i z_i = 292757 \text{ cm}^2.\end{aligned}$$

- (a) On which height does the height of the child depend more linearly, the height of the father or the mother?
- (b) Using the best linear regression model, predict the height of a child with a father 181 cm tall and a mother 163 cm tall?
- (c) How much will increase the height of the child for each centimeter that increases the height of the father? And for each centimeter that increases the height of the mother?
- (d) How would the reliability of the prediction be if the heights were measured in inches? (An inch is 2.54 cm).