

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.

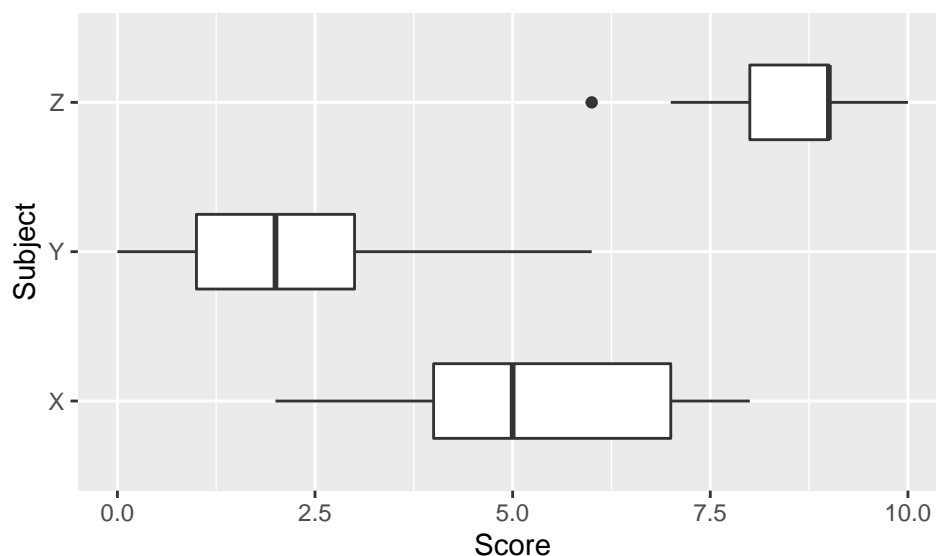
Patients	Frequency
(10, 14]	6
(14, 18]	10
(18, 22]	7
(22, 26]	6
(26, 30]	1

- 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 centimetres, 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) According to the linear model, how much will increase the height of the child for each centimetre that increases the height of the father? And for each centimetre 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).