

EXAM OF STATISTICS (DESCRIPTIVE STATISTICS AND REGRESSION)

2nd Physiotherapy

Version A

March, 25 2022

Name:

DNI:

Group:

Duration: 1 hour.

- (5 pts.) 1. The time required by a drug A to be effective has been measured (in minutes) in a sample of 150 patients. The table below summarizes the results.

Response time	Patients
$(0, 5]$	5
$(5, 10]$	15
$(10, 15]$	32
$(15, 20]$	36
$(20, 30]$	42
$(30, 60]$	20

- Are there outliers in the sample? Justify the answer.
- What is the minimum time for the 20% of patients with highest response time?
- What is the average response time? Is the mean representative?
- Can we assume that the sample comes from a normal population?
- If we take another sample of patients with mean 18 min and standard deviation 15 min, in which group is greater a response time of 25 min?

Use the following sums for the computations: $\sum x_i = 3105$ min, $\sum x_i^2 = 83650$ min², $\sum (x_i - \bar{x})^3 = 206851.65$ min³ y $\sum (x_i - \bar{x})^4 = 8140374.96$ min⁴.

- (2.5 pts.) 2. We have measured the average number of weekly hours of study X and the score in a clinic entrance test Y of 8 candidates, getting the following results:

$$\begin{aligned} \sum x_i &= 15.9, \sum \log(x_i) = 3.852, \sum y_j = 41.5, \sum \log(y_j) = 11.511, \\ \sum x_i^2 &= 42.23, \sum \log(x_i)^2 = 5.559, \sum y_j^2 = 274.25, \sum \log(y_j)^2 = 20.742, \\ \sum x_i y_j &= 103.3, \sum x_i \log(y_j) = 28.047, \sum \log(x_i) y_j = 32.616. \end{aligned}$$

- Compute the equations of the logarithmic and exponential regression models of the score as a function of the average number of hours of study.
- Use the best of the previous models to predict the score for somebody that study 3.2 hours a week.