Abdullah Gul University

Math-301 (Probability & Statistics)

Fall 2022, QUIZ - I

Name & Surname:
ID Number:

Q 1. (100 pt.)

According to the journal Chemical Engineering, an important property of a fiber is its water absorbency. A random sample of 20 pieces of cotton fiber was taken and the absorbency on each piece was measured. The following are the absorbency values:

a. What is the sample size for the sample below? (30 pt)
b. Calculate the sample mean value. (30 pt)
c. Calculate the sample median measurement. (30 pt)
d. Compute the 40% trimmed mean value. (10 pt)

18.7	21.4	20.7	21.8	19.2
23.7	19.4	20.5	18.9	20.3
19.2	21.7	22.1	19.7	18.0

SOLUTION:

a. Sample size = 3x5 = 15

b. Mean = $\mu = \frac{18.7+21.4+20.7+21.8+19.2+22.4+20.1+23.7+19.4+ \ldots\ldots\ldots\ldots +23.0}{sample\ size} = \frac{305.3}{15} \approx 20.35$

c. First, let us sort the measurements as below;

18.0	18.7	18.9	19.2	19.2
19.4	19.7	20.3	20.5	20.7
21.4	21.7	21.8	22.1	23.7

Then, the sample size is an odd number, so:
Median = $m = x_{(n+1)/2} = 20.7$

d. Again, let us sort the measurements as below;

~~18.0~~	~~18.7~~	~~18.9~~	~~19.2~~	~~19.2~~
~~19.4~~	19.7	20.3	20.5	~~20.7~~
~~21.4~~	~~21.7~~	~~21.8~~	~~22.1~~	~~23.7~~

In order to eliminate the largest 40% and smallest 40% from the total measurements, eliminate the values of a total of 6 (=15x40%) smallest values (18.0, 18.7, 18.9, 19.2, 19.2, and 19.4) and the values of a total of 6 (=15x40%) largest values (20.7, 21.4, 21.7, 21.8, 22.1 and 23.7) from the table. Then\ let us calculate the 40% trimmed mean value:

Mean-tr(40%) = $\mu = \frac{19.7+20.3+20.5}{new\ sample\ size} = \frac{60.5}{3} \approx 20.17$