Politecnico di Milano
Scuola di Ingegneria Industriale e dell'Informazione
Applied Statistics
June 16th, 2023

Problem 1: Noise pollution due to cars

Noise pollution is a prevalent environmental issue caused by various sources, including transportation. We want to understand how the category and the fuel type of vehicles affect noise pollution levels.

The dataset `noise.txt` contains noise pollution measurements (expressed in dB), the category (*passenger* or *commercial* vehicle) and the fuel type (*diesel*, *gasoline* or *ethanol*) of 120 vehicles, randomly and independently chosen.

a) Formulate a complete ANOVA model to check if the vehicle category and/or fuel type have a significant effect on the noise pollution. Verify the assumptions of the model.

b) Through appropriate statistical tests, propose a reduced model.

c) Report the estimates of the parameters of the model at point b).

d) Provide Bonferroni intervals (global level 95%) for the differences in the mean between the homogeneous groups identified by the model at point (b). Given the confidence level, what is the final number of groups that should be considered?

Upload your results here:
`https://forms.office.com/e/eipYnaG2ec`