**Assigment:**

**Due:** maximum 7 days after the last lecture ( 30/03/2022 before 23:00)

**Homicide Victims**: The data are from a survey of 1308 people in which they were asked how many homicide victims they know. The variables are:

* **resp**: The number of victims the respondent knows, and
* **race**: The race of the respondent (black or white).

**Scientific question**: Does race help explain how many homicide victims a person knows?

1. Fit a Poisson model.
2. Calculate the risk ratio and the corresponding confidence interval.
3. Calculate the ratio of the means of the response for each race (mean response for black/mean response for white). Comment.
4. Calculate the predictions of the models for each race.
5. Analyze the GOF of the model (deviance test, overdispersion...)
6. Fit a negative binomial model and get estimated model based variances (per race) for the counts. Compare them with the observed variances.
7. Fit a Quasi-likelihood model.
8. Discuss all results.

**Project:**

* After the first lecture the students organize themselves in tutorial groups within 7 days. Each group should be integrated by around 5 students.
* Each group emails Prof. Alonso the following information about the members: names, student numbers and with GLM in the subject of the email. Based on this list the final groups will be created. Please note that the students propose the groups but the professor will make the final groups. Typically, the groups that send their list first have a higher probability of staying together.
* The project is assigned.
* The assignment is on Toledo → Course Documents.
* Each tutorial group have to write a report with a detailed discussion of the analysis. A report should contain no more than 3 sheets in total, including the title page, i.e., if you print your report it should not exceed 3 sheets two sided. Please use an A4 page format, a times new roman 12 font and a 1.2 spacing between lines.
* Each tutorial group send an electronic copy of the report of the project, as well as, the R code used in the analysis to Prof. Ariel Alonso Abad maximum 7 days after the last lecture ( 30/03/2022 before 23:00). Please send the report and the R code as independent files. Deadlines and other aspects of the course may be adjusted depending on the Covid-19 situation. In that case you will be informed timely on Toledo.
* The title page of the report should contain the number of the group and a list with the names and student numbers of all the members of the group. Please note that these reports are part of your evaluation, thus follow theses instructions very carefully.
* The project will account for 5 points and the exam for 15 points.
* If you have to do a second chance exam then the grade of the project will still be part of your final grade.

The report should contain a description of the analysis of the case study, a discussion of the results, model checking, etc (think about it as a report that you will give to a client). Students are encouraged to look for alternative analyses and techniques in the literature, if the models studied in the course are not appropriate to answer the scientific questions of the case study. The idea is to mimic the real work of a consulting statistician in the academia or the industry.