Projects Model Based Clustring:

- **Mixture Discriminant Analysis**: read Section 4.6 of the book of Charles Bouveyron available here (https://math.univ-cotedazur.fr/~cbouveyr/MBCbook/) and implement the EM algorithm from scratch.
- **Generate MNAR data**: explain why the MNAR mechanism is challenging (read Section 15.1 of the book of Little and Rubin (Statistical Analysis with Missing Data - send an email to Aude Sportisse to get the reference)), introduce synthetic MNAR values in a complete dataset and check that basic imputation methods (e.g. missforest) is not adapted in this case.
- **Comparison of LDA and QDA with BIC**: read Section 3 of the book Elements of Statistical Learning available here (https://hastie.su.domains/Papers/ESLII.pdf) on Quadratic Discriminant Alaysis (QDA), implement it from scratch and compare it with LDA (already implemented in class) by using Bayesian Information Criterion (BIC).
- **Model-Based Clustering of Count Data**: read Section 6.4 of the book of Charles Bouveyron available here (https://math.univ-cotedazur.fr/~cbouveyr/MBCbook/) and implement the Poisson Mixture Models from scratch.