

Problem 1 - Parametric? Non-parametric?

1. From a statistical standpoint, a parametric method requires some assumptions (of values and/or the nature of the problem and/or data) to be satisfied for its proper use. Whereas, a non-parametric method requires none.

From a machine learning standpoint, a parametric method is a method with known and defined parameters provided some assumptions hold. It functions the same way every time and isn't dependent on any parameter value. Alternatively, a non-parametric one has undefined parameters and it's our job to define them; it becomes parametric when we set those parameters.

2. That being said, we'll categorize some of the methods we've learned:
 - a. **Ordinary Least Squares is parametric** because the parameters (coefficients) are determined using the data and not set experimentally (i.e CV).
 - b. **LASSO is non-parametric** because in order to get the best results we have to appropriately set λ .
 - c. **Polynomial Regression is non-parametric** because it relies on the degree of the polynomials.
 - d. **Smoothing Splines is non-parametric** because again, similar to LASSO, we need to find λ .
 - e. **Local Regression is non-parametric** because we must find a suitable λ .
 - f. **Generalized Additive Models is non-parametric** because we need to pick a basis function. Then, *backfitting* finds a suitable *dof* at each predictor.