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Problem 1 (T, 3 Points).   Parametric or Non-parametric

1. [1pt] Describe, in your own words, what the difference between a parametric and a non-parametric method is.

- Parametric methods assume an underlying function the the data distribution with parameters that can be learned and approximated, but can perform poorly if the underlying assumptions about the data distribution are not upheld.
- Non-parametric methods don't make such strong assumptions about the underlying functional form of the data distribution, making them somewhat more flexible, but often require more data to learn the patterns and achieve the same levels of performance.

2. [2pts] For each of the following methods you have learned about in the lectures so far, decide if it is parametric or non-parametric and *explain your reasoning*:

- LASSO: parametric - used for regression, assumes linear relationship between input and outputs, and estimates model parameters.
- Smoothing Splines: non-parametric - does not assume single functional form to data distribution, thus no predetermined parameters based on assumed distributions.
- Local Regression: non-parametric - does not assume a global functional form to the data distribution, but fits local regression curves around
- Generalized Additive Models: parametric-ish - parametric functions are assumed for some predictors, while others are modelled non-parametrically.