The lasso, persistence, and cross-validation

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The Setup

Suppose we have data

$$\mathcal{D}_n = \{(Y_1, X_1^\top), \ldots, (Y_n, X_n^\top)\}$$

where

- $X_i = (X_{i1}, \ldots, X_{ip})^\top \in \mathbb{R}^p$ are the features (covariates)
- $Y_i \in \mathbb{R}$ are the responses

The lasso