

HW for 2019-06-05

(due: 2019-06-12)

1: How many factors? The (economy) pivoted QR factorization is used for factor selection least squares; we compute

$$A\Pi = QR$$

and then only fit based on the first k columns of Π . Given Q and b , write a code to compute the mean LOOCV statistic

$$\text{LOOCV} = \frac{1}{m} \sum_{i=1}^m r_{(-i)}^2$$

for $k = 1, \dots, n$. Ideally, your code should take $O(mn)$ time.

Note: You really do only need Q and b !

2: Maximum likelihood for least squares Consider the statistical model

$$y = Ax + e$$

where $e \sim \mathcal{N}(0, \sigma^2 I)$. Derive the maximum likelihood estimates for x and σ^2 given observed data y .