APTS High-Dimensional Statistics: Assignments

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You only need to complete one of the following questions.

1. Show the consistency of the Lasso estimator in the high-dimensional logistic regression.

   Reference: Meier, L., Van De Geer, S., & Bühlmann, P. (2008). The group lasso for logistic regression. Journal of the Royal Statistical Society: Series B (Statistical Methodology), 70(1), 53-71.

2. Show the asymptotic normality of the de-biased Lasso estimator in the high-dimensional logistic regression.

   Reference: Van de Geer, S., Bühlmann, P., Ritov, Y. A., & Dezeure, R. (2014). On asymptotically optimal confidence regions and tests for high-dimensional models. Annals of Statistics, 42(3), 1166-1202.

3. Show the consistency of the Lasso estimator in the high-dimensional Ising model.

   Reference: Ravikumar, P., Wainwright, M. J., & Lafferty, J. D. (2010). High-dimensional Ising model selection using ℓ_1-regularized logistic regression. The Annals of Statistics, 38(3), 1287-1319.

4. Show the consistency of ℓ_0-penalised change point estimators in the high-dimensional logistic regression.

   Reference: Rinaldo, A., Wang, D., Wen, Q., Willett, R., & Yu, Y. (2021, March). Localizing changes in high-dimensional regression models. In International Conference on Artificial Intelligence and Statistics (pp. 2089-2097). PMLR.

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