

## HOMEWORK 4

Question: Write Newton-Raphson algorithm to estimate logistic regression by yourself.

1. Generate  $X = (1, X_1, X_2, X_3)$ , where  $X_j \sim N(0, I_N)$ .
2. Set true parameter  $\beta = (-1, 2, -3, 0.5)^\top$ .
3. Set  $N = 200, 400, 800, 1600$ .
4. Estimate  $\beta$  using  $NR$  algorithm for  $R = 200$  times. For each  $j$ , draw  $(\hat{\beta}_j^{(r)} - \beta_j)$  in boxplot for  $N = 200, 400, 800, 1600$ .

Submit your code (with detailed comments) + report your plot & findings in html.