

## Homework problem 8

### Short intuition problems

Choose and explain briefly. If you need additional assumptions to reach your conclusion, specify them.

1. What is not an advantage of using logistic loss over using squared error loss with 0-1 coding for 2-class classification?
  - (a) That the expected prediction error is minimized by correctly predicting  $P(Y|X)$ .
  - (b) That it has a natural probabilistic generalization to  $K > 2$  classes.
  - (c) That its predictions are always legal probabilities in the range  $(0, 1)$ .
2. In the generative 2-class classification models LDA and QDA, what type of distribution does  $P(Y|X = x)$  have?
  - (a) Unknown
  - (b) Gaussian
  - (c) Bernoulli
3. We mentioned in class that Naive Bayes assumes  $P(\mathbf{x}|Y = g) = \prod_{j=1}^p P_j(x_j|Y = g)$ . In what situation would you expect this simplifying assumption to be most useful?
  - (a) Small number of predictors, not highly correlated.
  - (b) Small number of predictors, highly correlated between them.
  - (c) Large number of predictors, not highly correlated.
  - (d) Large number of predictors, many highly correlated between them.