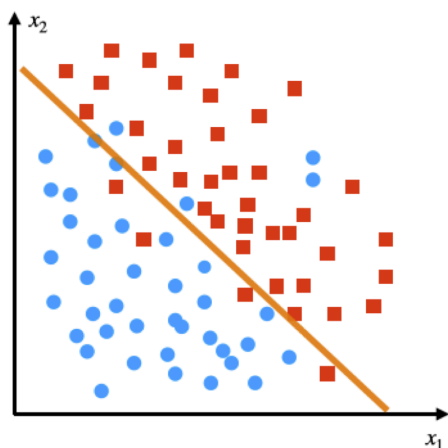# Introduction to machine learning for engineers

Example questions

1. A model you trained seems to be overfitting. You decide to significantly increase the strength of the regularization. This will always improve the test error.

   - True
   - False

2. The test loss of logistic regression is always zero.

   - True
   - False

3. Heidi is working on some linear regression problem to predict the price of goat milk. When training her model, she gets a loss of 0. Which of the statements below **must then be true**?

   (a) We must have $y^{(i)} = 0 \ \ \forall \ i \in \{1, ..., N\}$

   (b) The weights $\mathbf{w}$ must all be 0 so that $\hat{y}^{(i)} = \mathbf{w}^T \boldsymbol{x}^{(i)} = 0$.

   (c) Our training set can be fit perfectly by a hyperplane (e.g., fit perfectly by a straight line if our data is 2-dimensional).

   (d) Gradient descent is stuck at a local minima and fails to find the true global minimum.

4. Which of these classifiers could have generated this decision boundary? **(multiple answers possible)**

   (a) k-nearest neighbor with k=1, using the Manhattan (L1) distance

   (b) k-nearest neighbor with k=1, using the Euclidean (L2) distance

   (c) Logistic regression

   (d) SVM

Answers:
1. False / 2. False / 3. c / 4. c, d.