Quiz 3

October 29, 2013

Name: _____ **NetID:** _____

Question 1. (1 point) Suppose we have an unbiased linear classifier $f_{\mathbf{w}}$ with weight vector $\mathbf{w}$ such that $||\mathbf{w}|| = 1$. Then, for a sample instance $(\mathbf{x}, y)$, the value $y(\mathbf{x} \cdot \mathbf{w})$ is called the...

Oops... two correct answers!

(a) Functional margin of $\mathbf{x}$

(b) Fundamental margin of $\mathbf{x}$

(c) Geometric margin of $\mathbf{x}$

(d) Mistake bound of $\mathbf{x}$

Question 2. (1 point) Consider a solution to the **dual version** of the SVM optimization problem in which $0 \leq \alpha_i < C$, for some i. Which of the following is **always** true?

(a) $\xi_i > 0$

(b) $\xi_i = 0$

(c) $\mathbf{x}_i$ is a support vector

(d) None of the above

Question 3. (1 point) Consider training a **soft-margin SVM classifier** on a sample set $S = \{(\mathbf{x}_1, y_1), ..., (\mathbf{x}_n, y_n)\}$ such that $max_i(||\mathbf{x}_i||) = 1$. We want to estimate the generalization error of our classifier by computing its n-fold **leave-one-out error**. Will leaving out an instance $\mathbf{x}_i$ with $\alpha_i = 0$ and $\xi_i = 0$ result in an error?

(a) Always

(b) Sometimes

(c) Never

(d) Insufficient information

Question 4. (1 point) Which of the following is **not** an example of a **discriminative** learning algorithm?

(a) k-Nearest Neighbors - [arguably generative]

(b) Support Vector Machine (SVM)

(c) Multivariate Naïve Bayes - [definitely generative]

(d) TDIDT (Decision Tree)