Quiz 8

⚠ This is a preview of the published version of the quiz

Started: Dec 11 at 4:52pm

Quiz Instructions

Question 1	1 pts

A random forest is an ensemble learning method that attempts to lower the training error of decision trees.

○ True

○ False

Question 2	1 pts

In each round of AdaBoost, the misclassification penalty for a particular training observation is increased going from round t to round $t + 1$ if the observation was

○ classified incorrectly by the weak learner trained in round t

○ classified incorrectly by the full ensemble trained up to round t

○ classified incorrectly by a majority of the weak learners trained up to round t

Question 3	1 pts

In the multi-class SVM the objective function is

$$\min \frac{1}{2} \sum_k w_k^T w_k$$

$$\text{s.t. } w_{y_i}^T x - w_{k_i}^T x \geq 1$$

There are some missing definitions of the symbols. Which of the following is true about them?

○ k represents different class labels and k_i is the one that does not equal to y_i but the distance between its corresponding w_k and w_{y_i} is the largest.

○ k represents different class labels and k_i is the one that does not equal to y_i but the distance between its corresponding w_k and w_{y_i} is the smallest.

○ k represents different class labels and the k_is are all the k that do not equal to y_i

○ k represents different class labels and the k_is range over all ks

Question 4   1 pts

During the lectures, it was mentioned that the 1 vs. All multi-class learning scheme is doing "local learning" and "global prediction". What is the most accurate interpretation of this among the following statements?

○ This process is a boosting process, where the training process gets weak binary classifiers for each class and the predicting process assigns different weights to the weak classifiers and makes better decisions.

○ The training process only optimizes one label/classifier at each example without the consideration of other labels. The predicting process looks at all labels and makes the best decision.

○ The training process can only converge to local optimums for each binary classifier. The predicting process looks at all labels and makes a prediction that is the global optimum of the optimization objective.

○ Neither the training nor the prediction process considers all classes for each training example, but the prediction process is guaranteed to converge to a global optimum with respect to the learning objective.

Question 5   1 pts

The AdaBoost algorithm is guaranteed to assign the highest weight in the final hypothesis to the weak learner that performs the best on the test set.

○ True

○ False

Question 6   1 pts

Which of the following is the correct math representation of the SVM margin (between the separator and the closest examples)?

○ $w^T w$

○ $\frac{1}{2} w^T w$

○ $\frac{1}{\|w\|}$

○ $\frac{2}{\|w\|}$

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