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# Week 7 Quiz

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## Checkboxes

0/1 point (graded)

Which of the following are FALSE about AdaBoost? (check all that apply)

- [x] Adaboost forms an ensemble of multiple weak classifiers into a single classifier.
- [x] AdaBoost is guaranteed to minimize the testing error to zero.
- [x] AdaBoost is done by bagging multiple weak classifiers.
- [x] AdaBoost is guaranteed to minimize the training error to zero.

✖

Submit You have used 1 of 1 attempt

✖ Incorrect (0/1 point)

## Multiple Choice

1/1 point (graded)

True or False: While it can significantly increase computation time, technically any classifier that performs better than random guessing can be boosted.

- (•) TRUE ✔
- ( ) FALSE

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)

When boosting a classifier, after round $t$ the misclassified weights are multiplied by _____.

- ◉ $e^{\alpha_t}$ ✔
- ○ $e^{-\alpha_t}$

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)

For a new data point $x_0$, which of the following represents the boosted prediction of $y_0$?

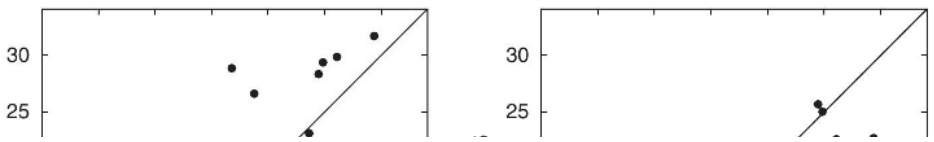
- ◉ $y_0 = \text{sign}(\sum_t \alpha_t f_t(x_0))$ ✔
- ○ $y_0 = \text{sign}(\sum_t f_t(x_0))$
- ○ $y_0 = \text{sign}(\alpha f(x_0))$
- ○ $y_0 = \text{sign}(f(x_0))$

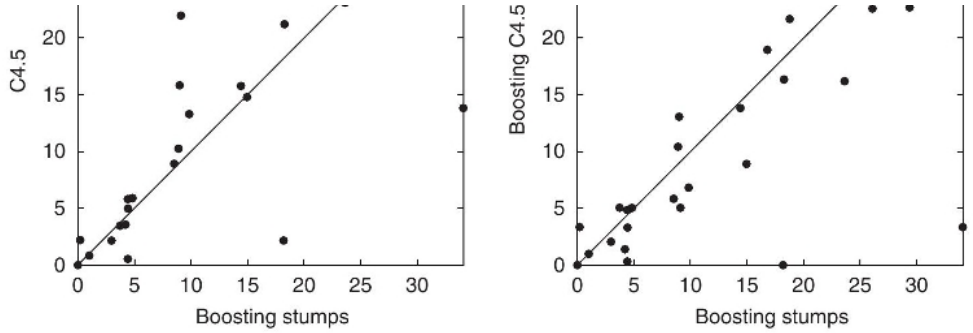
Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)






The left and right figures compare a weak decision stump classifier to a complex decision tree classifier (C4.5) in the boosting framework. Which of the following statements is most accurate based on the figures.

- (•) Boosting a weak classifier is generally better than not boosting a strong classifier. ✔
- ( ) C4.5 should be chosen over a decision stump in all scenarios.
- ( ) There is no advantage to boosting a decision stump instead of boosting C4.5.

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)

True or False: The K-means objective function is convex and therefore the output of the K-means algorithm is the one true global solution.

- ( ) TRUE
- (•) FALSE ✔

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Checkboxes

1/1 point (graded)

Which of the following models are unsupervised?

- [x] K-means
- [ ] K-nearest neighbors
- [ ] Logistic regression
- [ ] Boosting a decision stump

✔

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)

True or False: The K-means algorithm will converge in a finite number of steps when there are finite observations.

- (•) TRUE ✔
- ( ) FALSE

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Text Input

1/1 point (graded)

(enter missing word) The difference between K-means and K-medoids is that they use different _____ measures.

distance ✔

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

## Multiple Choice

1/1 point (graded)

The K-means objective function is $\sum_{n=1}^{N} \sum_{k=1}^{K} \mathbf{1}\{c_n = k\} \|x_n - \mu_k\|^2$. We discussed an algorithm for optimizing over all $c$ and $\mu$ using _____.

- gradient ascent
- coordinate ascent
- gradient descent
- coordinate descent ✔

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✔ Correct (1/1 point)

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