Quiz 1

Problem 1

1/1 point (graded)

Suppose you have collected a set of 1,000,000 labeled data points and you build a nearest neighbor classifier from them. You then choose 100 of these points at random, and find that your classifier returns the correct answer on all of them. Can you conclude that your algorithm works with a 0% error rate on any input? Why or why not?

- Yes, you have empirical evidence indicating a 0% error
- Yes, since there were 100 random experiments, all of which returned the right answer
- No, more random experiments are required because the data set is large
- ✔ No, the randomly selected points are from the training set, so nearest neighbor gets them right

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Problem 2

1/1 point (graded)

What are the differences between test error and training error?

- Test error is a poor indicator of model accuracy; training error provides an accurate indication of model accuracy.

- (•) Test error is the error a model exhibits on new data; training error is the error a model exhibits on data that it has already seen.
- ( ) Test error decreases as the test set grows; training error increases as the training set grows.

✔

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Problem 3

1/1 point (graded)

Let's say you develop a classification algorithm and you are given a training set of 100,000 points. Your algorithm requires a parameter, k, on which the accuracy of the model depends. Which of the following is most likely to determine a value of k that will result in a low error rate?

- ( ) Choose the value of k that minimizes the error on the training set
- ( ) Use a subset of the training set as a validation set and choose the value of k that results in the lowest error rate on this validation set when the classifier is trained on the remainder of the training set
- ( ) Use a subset of the training set as a validation set and choose the value of k that results in the lowest error rate on this validation set when the classifier is trained on the entire training set
- (•) Partition the training set into multiple pieces, and treat each, in turn, as a validation set while training on the remaining data. Choose the value of k that results in the lowest average error rate on these validation sets

✔

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Problem 4

1/1 point (graded)

When choosing a value of k for k-nearest neighbor classification, a larger value of k will necessarily guarantee a smaller error rate.

- ○ True
- ◉ False ✔

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Problem 5

1/1 point (graded)

You are designing a procedure that determines which grocery-related advertisements will be shown to a user of your company's website. You are given a list of features related to the user and must choose which ones to include in the procedure and which to omit. Select the two features below that would be most relevant for your model.

- ☑ Number of times user accessed an advertiser's website
- ☑ Age of the user
- ☐ User's email address
- ☐ User's name

✔

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Problem 6

1/1 point (graded)

Which of the following is/are NOT a property of metrics?

- [ ] $d(x,y) \geq 0$
- [ ] $d(x,y) = d(y,x)$
- [x] $d(x,y) \leq M, M$ is an arbitrary constant
- [x] $d(x,z) \leq d(x,y) - d(y,z)$

✔

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Problem 7

1/1 point (graded)

Which pair of the following three strings have the smallest edit distance?

x = $hose$

y = $house$

z = $noise$

- (•) x and y
- ( ) x and z
- ( ) y and z
- ( ) They are all the same distance

✔

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Problem 8

1/1 point (graded)

The edit distance between the strings $carrot$ and car is the same as the edit distance between the strings $bike$ and $poker$.

- (•) True
- ( ) False

✔

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Problem 9

1/1 point (graded)

What is the L_2 distance between the points $(1, 2)$ and $(-1, 3)$?

- ( ) 1.33
- ( ) 1.73
- (•) 2.24
- ( ) 3

✔

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Problem 10

1/1 point (graded)

A key difference between algorithms and machine learning is that an algorithm designer provides a clearly defined process for mapping an input to an output, whereas a person designing a classifier does not need to provide a clearly defined process for mapping inputs to outputs.

- (●) True
- ( ) False

✔

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Problem 11

1/1 point (graded)

What type of output space do classification problems have?

- (●) Discrete
- ( ) Continuous
- ( ) Probability Values

✔

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Problem 12

1/1 point (graded)

Which of the following are possible output values for probability estimation?

- ( ) $(-\infty, \infty)$
- ( ) $[0, \infty)$
- ( ) $\{true, false\}$
- (●) $[0, 1]$

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