

survival8

BITS WILP Machine Learning Quiz-2 2017-H2

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Question 1

Consider the task of building a classifier from random data, where the attribute values are generated randomly irrespective of the class labels. Assume the data set contains records from two classes, "+" and "-." Half of the data set is used for training while the remaining half is used for testing. Suppose there are equal number of "+" and "--" records in test data set and classifier predicts every test record to be positive. What is the expected error rate of the classifier on the test data?

Select one:

- ☐ a. Information is not enough.
- ☐ b. 0%
- ☐ c. 100%
- ☒ d. 50%

Feedback

The correct answer is: 50%

Question 2

We built a classifier to detect which gender a name belongs to. We represent each name in term of the following features.

- Number of characters in the name.
- Number of vowels.
- If name contains character y or not. (1 for yes, and 0 for no)

Training data set is as follows:

Akash: Male

Pinky: Female

State which one of the following is true?

Select one or more:

- ☒ a. The dimensionality of the data under this feature representation is 3.
- ☐ b. The dimensionality of the data under this feature representation is 2.
- ☒ c. The feature vectors of the training name Pinky is [5,1,1].
- ☐ d.

The feature vectors of the training name Akash is [5,2,1].

Feedback

The correct answer is: The dimensionality of the data under this feature representation is 3., The feature vectors of the training name Pinky is [5,1,1].

Question 3

Which of the following statements are true?

Select one or more:

- ☒ a. We can use Genetic Algorithm for classification.
- ☒ b. Crossover is essential in Genetic Algorithm.
- ☐ c. We cannot use Genetic Algorithm for classification.
- ☐ d. Mutation is essential in Genetic Algorithm.

Feedback

The correct answer is: Crossover is essential in Genetic Algorithm., We can use Genetic Algorithm for classification.

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Question 4

Consider the task of building a classifier from random data, where the attribute values are generated randomly irrespective of the class labels. Assume the data set contains records from two classes, "+" and "-." Half of the data set is used for training while the remaining half is used for testing. Suppose there are equal number of "+" and "-" records in test data set and classifier predicts each test record to be positive class with probability 0.8 and negative class with probability 0.2. What is the expected error rate of the classifier on the test data?

Select one:

- ☐ a. 100%
☐ b. 0%
☐ c. Information is not enough
☒ d. 50%

Feedback

The correct answer is: 50%

Question 5

Which of the following statements are true about univariate Gaussian Distribution?

Select one or more:

- ☐ a. Mean and Mode are different.
☒ b. Mean and Mode are same.
☐ c. None of them.
☒ d. Beta Distribution is prior conjugate.

Feedback

The correct answer is: Mean and Mode are same., Beta Distribution is prior conjugate.

Question 6

Consider the following transformation of the feature space where $X = (x_1, x_2)$
 $\Phi(x) = (x_1^2, \sqrt{2}x_1x_2, x_2^2)$. Which one is the valid kernel for this transformation?

Select one:

- ☐ a.
 $K(x, z) = (x^T z)$
☐ b. $K(x, z) = (x^T z + 1)^2$
☐ c. None of them.
☒ d. $K(x, z) = (x^T z)^2$

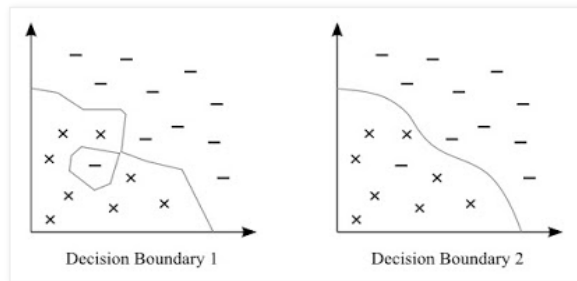
Feedback

The correct answer is:

$$K(x, z) = (x^T z)^2$$

Question 7

Figure illustrates decision boundaries for two nearest-neighbor classifiers. Which of the following statements are true?



Select one or more:

- ☒ a. Decision boundary 1 belongs to 1 nearest neighbor.
☐ b. Decision boundary 1 belongs to 3 nearest neighbor.
☐ c. Decision boundary 2 belongs to 1 nearest neighbor.
☒ d. Decision boundary 2 belongs to 3 nearest neighbor.

Feedback

The correct answer is: Decision boundary 1 belongs to 1 nearest neighbor., Decision boundary 2 belongs to 3 nearest neighbor.

Question 8

Which one of the following statements are true?

Select one or more:

- ☐ a. K-NN has slow training time, does not take into account the overall distribution of the data.
☐ b. None of them.
☒ c. Perceptron has slow training time in respect to K-NN.
☐ d. K-NN has slow testing time, does take into account the overall distribution of the data.

Feedback

The correct answer is: Perceptron has slow training time in respect to K-NN.

Question 9

Which one of the following statements are true?

Select one or more:

- ☒ a.
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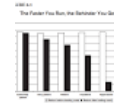
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- ☐ b.
 Perceptron can classify nonlinear separable data accurately.
☐ c. All of them.
☐ d. Perceptron can only be used to classify two dimensional input.

Feedback

The correct answer is:

Neural network use to capture nonlinear relationship between input and output.

Question 10

Which of the options are true for the given statement.?

Given a set of linearly separable training examples, we train the perceptron algorithm twice, initializing the weights differently for each run. The two training procedures traverse the data points in the same order and are run until convergence.

Select one or more:

- ☐ a. two resulting classifiers have the same performance on the test set
☒ b. two resulting classifiers have the different performance on the test set
☐ c. two resulting classifiers have the different performance on the training set
☒ d. two resulting classifiers have the same performance on the training set

Feedback

The correct answer is: two resulting classifiers have the same performance on the training set, two resulting classifiers have the different performance on the test set

Question 11

Which of the Boolean function given below is linearly separable?

Select one or more:

- ☐ a. $(X \text{ XOR } Y) \text{ AND } (X \text{ OR } Y)$
☒ b. $\text{NOT } X \text{ AND } Y$
☒ c. $X \text{ AND } Y \text{ AND } Z$
☒ d. $(X \text{ OR } Y) \text{ AND } (X \text{ OR } Z)$

Feedback

The correct answer is: $X \text{ AND } Y \text{ AND } Z$, $\text{NOT } X \text{ AND } Y$, $(X \text{ OR } Y) \text{ AND } (X \text{ OR } Z)$

Question 12

State True/False for the following statement. The Support Vectors do not change when we train SVM directly on input and when we map input to the higher dimension and then train SVM.

Select one:

- ☒ a. False
☐ b. True

Feedback

The correct answer is: False

Question 13

We built a classifier to detect which gender a name belong to. We represent each name in term of the following features.

- Number of characters in the name.
- Number of vowels.
- If name contains character y or not. (1 for yes, and 0 for no)

Training data set is as follows:

Akash: Male

Pinky: Female

Using the kNN algorithm with $k = 1$ and Euclidean (L_2) distance, we want to predict the gender of name = Whisky.

State which of the following statements are true?

Select one or more:

- ☐ a. L_2 distance between Akash and Whisky is 3 and classifier predicts Male.
☐ b. L_2 distance between Akash and Whisky is 2 and classifier predicts Female.
☒ c. L_2 distance between Pinky and Whisky is 1 and classifier predicts Female.
☐ d. L_2 distance between Pinky and Whisky is 2 and classifier predicts Female.

Feedback

The correct answer is: L_2 distance between Pinky and Whisky is 1 and classifier predicts Female.

Question 14

Consider the following training set in 2-dimensional Euclidean space.

Point	Coordinate	Class
X1	(-1, 1)	Negative
X2	(0, 1)	Positive
X3	(0, 2)	Negative
X4	(1, -1)	Positive
X5	(1, 0)	Positive
X6	(1, 2)	Positive
X7	(2, 2)	Negative
X6	(1, 3)	Positive

Which of the following is true?

Select one or more:

- ☒ a.

If 8NN classifier is consider, point (0,0) belongs to Positive class.

☒ b.

If 5NN classifier is consider, point (0,0) belongs to Positive class.

☒ c. If 2NN classifier is consider, point (0,0) belongs to Positive class.☒ d.

If 1NN classifier is consider, point (0,0) belongs to Positive class.

Feedback

The correct answer is:

If 8NN classifier is consider, point (0,0) belongs to Positive class.,

If 1NN classifier is consider, point (0,0) belongs to Positive class.,

If 5NN classifier is consider, point (0,0) belongs to Positive class., If 2NN classifier is consider, point (0,0) belongs to Positive class.

Question 15

Which of the following statement are true ?

Select one or more:


☐ a. Genetic algorithm always stuck to the local minimum.☒ b. Gradient decent method always stuck to the local minimum.☐ c. Genetic algorithm runs faster than Gradient decent method.☐ d. All of them.**Feedback**

The correct answer is: Gradient decent method always stuck to the local minimum.

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