

# Quiz 10

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

Started: Dec 11 at 4:52pm

## Quiz Instructions

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### Question 1

1 pts

In the discriminative approach to solving classification problems, we model the conditional probability of the labels given the observations.

- True
- False

### Question 2

1 pts

Which is true about generative and discriminative models?

- Generative models model the joint distribution  $P(\text{class} = C \text{ AND sample} = x)$
- Perceptron is a generative model
- Logistic regression is a discriminative model
- The naive Bayes classifier is a generative model

### Question 3

1 pts

Assume you are learning a generative naive Bayes model with some training data of which the label distribution does not reflect the real-world label distribution (and that of the test data).

Which of the following probabilities would you use to best estimate whether or not to predict  $y_0$  given input  $X$ ?

$P(X|y_0)P(y_0)$

$P(X|y_0)$

$P(X, y_0)$

$P(X)P(y_0)$

**Question 4****1 pts**

Assume you have a program that prints one of the 3 labels A, B, C every time you run it. The distribution of the printed result of each run is  $P(A)=m$ ,  $P(B)=m$ ,  $P(C)=1-2m$ .

Assume in a single trial, you run this program 15 times and observe 3 times of A, 1 time of B and 11 times of C in the printed outputs, according to MLE, what is the estimation of  $m$ ?

$1/15$

$2/15$

$1/6$

$1/5$

**Question 5****1 pts**

When estimating probabilities, why do we need smoothing?

- When the data is too sparse, the estimate is not accurate.
- When the data is too dense, the estimate is not accurate.
- To give unseen examples in test data a non-zero probability.
- To give examples in training data more weights than unseen examples in test data.

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