9th April quiz

6 out of 6 correct

1. In Multinomial Naive Bayes, what is the likelihood function used to model the conditional probability of the features given the class?

- ○ Gaussian
- ○ Poisson
- ○ Bernoulli
- ◉ Multinomial

Explanation: In Multinomial Naive Bayes, the likelihood function used to model the conditional probability of the features given the class is the Multinomial distribution.

2. In Multinomial Naive Bayes, how are the probabilities of the features calculated?

- ◉ By assuming that the features are independent
- ○ By assuming that the features are dependent
- ○ By using a linear regression model
- ○ By using a decision tree model

Explanation: In Multinomial Naive Bayes, the probabilities of the features are calculated by assuming that the features are independent, which is why it is called "naive".

3. What is the output of a Gaussian Naive Bayes classifier?

- ◉ A probability distribution over classes

- ◯ A binary classification label (positive or negative)
- ◯ A continuous value
- ◯ None of the above

Explanation: The output of a Gaussian Naive Bayes classifier is a probability distribution over classes. For each instance, the classifier calculates the probability of that instance belonging to each class, based on the values of its features. The class with the highest probability is then chosen as the predicted class for that instance. This output is useful because it not only provides a predicted class label, but also a measure of confidence in that prediction.

4. Which type of data is Gaussian Naive Bayes best suited for?

- ◯ Categorical data
- ◉ Numerical data
- ◯ Text data
- ◯ Image data

Explanation: Gaussian Naive Bayes is best suited for numerical data, where each feature has a continuous value. This is because Gaussian Naive Bayes assumes that the distribution of each feature is Gaussian (normal), which is a good assumption for numerical data. For categorical data, a different type of Naive Bayes classifier such as Multinomial Naive Bayes would be more appropriate. Text and image data are usually preprocessed into numerical data before being used with Naive Bayes classifiers.

5. In Bayesian inference, what is the prior distribution?

- ◯ The distribution of the data
- ◉ The distribution of the parameter or hypothesis before seeing the data
- ◯ The distribution of the parameter or hypothesis after seeing the data
- ◯ None of the above

Explanation: The prior distribution in Bayesian inference is the probability distribution that represents our knowledge or beliefs about the parameter or hypothesis before seeing the data. This prior distribution is updated using Bayes' theorem to obtain the posterior distribution, which represents our knowledge or beliefs about the parameter or hypothesis after seeing the data.

6. What is the difference between Bayesian inference and classical (frequentist) inference?

- (●) Bayesian inference involves the use of prior knowledge, while classical inference does not.
- ( ) Classical inference involves the use of prior knowledge, while Bayesian inference does not.
- ( ) Bayesian inference is only used for discrete data, while classical inference is used for continuous data.
- ( ) There is no difference between the two.

Explanation: Bayesian inference involves the use of prior knowledge or beliefs about a parameter or hypothesis, which are updated in light of new data using Bayes' theorem. Classical inference, on the other hand, does not involve the use of prior knowledge and instead relies on the properties of the data sample and the sampling distribution. Bayesian inference is often used in cases where prior knowledge or expertise can provide valuable insights or help to inform the analysis.

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