IMPORTANT QUESTIONS

1) Explain how Maximum a Posteriori (MAP) probability can be used to estimate the unknown parameter from data.

2) State Bayes' Theorem and elaborate on its applications.

3) Differentiate between Discrete and Continuous random variables

4) Explain the terms: population, sample, parameters and statistics with an example

5) Can quantification of uncertainty through probabilistic models enhance the decision-making process in Machine Learning applications? Illustrate with an example.

6) Define the following terms. I. Joint probability II. Marginal Probability III. Conditional Probability

7) Define Interquartile Range

8) What are some real-world applications of probability in machine learning?

9) Explain the intuition behind joint, marginal, and conditional probability.

10) Explain the following with an example: i. Random experiment ii. Event iii. Trials

11) How do Maximum A Posteriori (MAP) and Maximum Likelihood Estimation (MLE) techniques differ?

12) How does the Gaussian Naive Bayes Classifier work, and what assumptions does it make about the features? What are its advantages and limitations?

13) Why do researchers often prefer sampling over studying the entire population?

14) Comment on the following a. When do you say two events are independent? b. State the Multiplication theorem of Probability for independent events. c. Are two independent events mutually exclusive.

15) Discuss the various definitions of probability, including the Classical, Frequentist and Axiomatic approaches. Highlight the merits and demerits of each definition with suitable examples.

16) State the Central Limit Theorem and elaborate on its applications for the large sample case.

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