CS7641 ML Practice Quiz

Module RL 5: Information Theory

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Question 1

What is the primary purpose of information theory in the context of machine learning?
A. To compare probability density functions.
B. To determine the efficiency of algorithms.
C. To measure the similarity or difference between input vectors.
D. To predict future trends in data.

Question 2

What does entropy measure in the context of information theory?
A. The amount of disorder in a system.
B. The predictability of a message sequence.
C. The minimum number of questions needed to predict the next symbol in a sequence.
D. The efficiency of an algorithm.

Question 3

What is the concept of joint entropy in information theory?
A. It measures the total randomness in two independent variables.
B. It is the sum of entropies of two variables.
C. It represents the randomness contained in two variables together.
D. It is used to calculate the efficiency of data transmission.

Question 4

In the case of two dependent coins where flipping one determines the result of the other, what is the mutual information between these two coins?

A. Zero
B. One
C. Less than one but greater than zero
D. Cannot be determined

Question 5

What does Kullback-Leibler (KL) divergence measure in information theory?

A. The similarity between two probability distributions.
B. The distance or difference between two probability distributions.
C. The entropy of a single distribution.
D. The joint probability of two distributions.

Answer Key

1. A, C
2. B, C
3. C
4. B
5. B