

Homework Assignment 9

Due: 16:00pm Tuesday, April 4, 2023

Problem 1. A source produces X with the following alphabet $\mathcal{A} = \{a_1, a_2, a_3, a_4, a_5, a_6\}$ and the corresponding probabilities are $\{0.1, 0.2, 0.3, 0.05, 0.15, 0.2\}$, respectively.

(a) Find the entropy of this source.

(b) Compare this entropy with the entropy of a uniformly distributed source with the same alphabet.

Problem 2. Please design the Haffman code for the source X in Problem 1.

Problem 3. Consider Hamming (7,4) code.

(a) Is 0011101 a codeword?

(b) If 0011101 is received, conduct decoding to find the decoded information bits.

(c) The probability of each bit error is 2% and bit errors are independent. If the information bits are 0001, what is the probability that the sequence 0011101 is received?

Assignment Project Exam Help

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