Unit 10 - Week 9: Data Compression-1 (Unit 9) and Data Compression-2 (Unit 10)

Weekly Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-11-18, 23:59 IST.

These questions are based on the Week-9 video lectures. Please use discussion forum in case you have any doubt.

For Q2-Q4, you can assume that the empty sequence (\Phi) is valid codeword.

1) Given a prefix-free code which assigns codeword of length ℓ_i to symbol $i \in [n]$, which of these always hold? ('log' stands for log base 2.) ***0 points***

- $\sum_{i\in[n]} \log \ell_i \geq 0$
- $\sum_{i\in[n]} \log \ell_i \leq 0$
- $2^{\ell_1} \leq 1$
- For $n \geq 2, 2^{l_1} + 2^{l_n} \leq 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$2^{\ell_1} \leq 1$
For $n \geq 2, 2^{l_1} + 2^{l_n} \leq 1$

2) Consider a source X with pmf ***1 point***
$P(0) = 1/2, P(1) = P(2) = 1/8, P(3) = P(4) = P(5) = P(6) = 1/16.$
What is the value of $\bar{L}(X)$?

- 3/4
- 1/4
- 3/2
- 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
3/4

3) Consider a source X with pmf ***1 point***
$P(0) = 1/2, P(1) = P(2) = 1/8, P(3) = P(4) = P(5) = P(6) = 1/16.$
What is the value of $\bar{L}^p(X)$?

- 3/4
- 9/4
- 3/2
- 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
9/4

4) Consider a source X with pmf ***1 point***
$P(0) = 1/2, P(1) = P(2) = 1/8, P(3) = P(4) = P(5) = P(6) = 1/16.$
What is the value of $\bar{L}_{0.25}(X)$?

- 3/4
- 9/4
- 2
- 1/4

No, the answer is incorrect.
Score: 0

Accepted Answers:
1/4

5) Consider a source X with pmf ***0 points***
$P(1) = 1/3, P(2) = 1/6, P(3) = 1/6, P(4) = 1/3.$
Which of the following is/are the Huffman code for this source?

- $1 \to 001$
  $2 \to 0110$
  $3 \to 1001$
  $4 \to 110$
- $1 \to 110$
  $2 \to 0110$
  $3 \to 1001$
  $4 \to 001$
- $1 \to 110$
  $2 \to 1001$
  $3 \to 0110$
  $4 \to 001$
- $1 \to 101$
  $2 \to 0110$
  $3 \to 1001$
  $4 \to 000$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1 \to 001$
$2 \to 0110$
$3 \to 1001$
$4 \to 110$
$1 \to 110$
$2 \to 0110$
$3 \to 1001$
$4 \to 001$
$1 \to 110$
$2 \to 1001$
$3 \to 0110$
$4 \to 001$