✓ **Congratulations! You passed!**

TO PASS 1% or higher

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GRADE
100%

Interview Questions: Data Compression (ungraded)

TOTAL POINTS 3

1. **Ternary Huffman codes.** Generalize the Huffman algorithm to codewords over the ternary alphabet (0, 1, and 2) instead of the binary alphabet. That is, given a bytestream, find a prefix-free ternary code that uses as few trits (0s, 1s, and 2s) as possible. Prove that it yields optimal prefix-free ternary code.

    1 / 1 point

    > Ternary Huffman codes.

    ✓ **Correct**
    > *Hint:* Combine smallest 3 probabilities at each step (instead of smallest 2). Don't forget to handle the case when the number of symbols is not of the form $3 + 2k$ for some integer k.

2. • Identify an optimal uniquely-decodable code that is neither prefix free nor suffix tree.

    • Identify two optimal prefix-free codes for the same input that have a different distribution of codeword lengths.

    1 / 1 point

    > Identify prefix free nor suffix free.
    > Identify two optimal prefix-free.

    ✓ **Correct**
    > Hint:

3. **Move-to-front coding.** Design an algorithm to implement move-to-front encoding so that each operation takes logarithmic time in the worst case. That is, maintain alphabet of symbols in a list. A symbol is encoded as the number of symbols that precede it in the list. After encoding a symbol, move it to the front of the list.

    1 / 1 point

    > Move to front coding.

    ✓ **Correct**
    > Hint: