

CS 530: Geometric and Probabilistic Methods in Computer Science Extra Credit (Fall '07)

1. Given the following sentence:
 “To know that we know what we know and to know that we do not know what we do not know, this is true wisdom. -Confucius”
 Compute the pmf for the set of characters in this distribution.
2. What is the entropy of this message?
3. How many bits are used for the 8-bit ascii encoding?
4. How many bits are required for the message if we have fixed length binary codes for each character. That is, each character has the same number of bits.
5. Compute the Huffman Encoding for this message. How many bits are required for the message now?
6. Illustrate the binary tree for the Huffman Encoding.
7. Identify a more optimal encoding (you can combine combinations of characters into a single symbol).
8. Discuss the cost (in bits) of the tree/ decode meta-information required for decoding the message. Should this factor in to the cost (in bits) of the signal?