暨大資工系期中考 (data compression) 99.11.10 (open book)

1. (10%) Given P(A)= 0.2, P(B)=P(C)=0.15, P(D)=P(E)=0.25, Find all strongly Huffman equivalent codes with the same average codeword length.

2. (10%) Show that Huffman code is optimal in terms of the minimum average codeword length.

3. (10%) Show that any uniquely decodable code is equivalent to one prefix code.

4. (10%) Suppose A_k is the number of combinations of n codewords that have a combined length of k. Show that : $A_k \le 2^k$.

5. (10%)Explain that why the Entropy is equal to the First-order Entropy when the source sequence is independent identically distributed (iid) ?

6. (10%) Explain that when the coding redundancy R is equal to zero?

7. (15%) In lecture note (page 17), explain why the symbols a_1 and a_3 can be correctly decoded whereas a_2 cannot, when only five bits are used to generate the tag during the decoding process..

8. (15%) Do the example (pp. 25-28) of lecture note arithmetic.pdf only by using E1 and E2.