



Date: 21/08/2015 Deadline: Monday (24/08/15) Morning Homework 2 for B.E ECE (V Sem)

1. A source has five outputs denoted $\{m_1, m_2, m_3, m_4, m_5\}$ with respective probabilities $\{0.30, 0.25, 0.20, 0.15, 0.10\}$. Determine the entropy of the source. What is the maximum entropy of a source with five outputs?
2. For a random variable taking value in DMS $\mathcal{S} = \{s_0, s_1, \dots, s_n\}$ with probabilities $\{p_0, p_1, \dots, p_n\}$, show rigorously that

$$H(S^n) = nH(S) \quad (1)$$

Hint: See problem 5.6 on Simon Haykins book, actually that is same problem.

3. Problem number 5.7 from the Book of Simon Haykins
4. Problem number 5.9 from the Book of Simon Haykins
5. Discuss how one can construct prefix codes via Huffman coding.
6. A source has five outputs denoted $\{m_1, m_2, m_3, m_4, m_5\}$ with respective probabilities $\{0.40, 0.20, 0.17, 0.13, 0.10\}$. Determine the code words to represent the source outputs using both the Huffman techniques. Also verify that whether Kraft's inequality is satisfied or not.
7. Problem number 5.11 from the Book of Simon Haykins
8. Problem number 5.13 from the Book of Simon Haykins
9. Problem number 5.15 from the Book of Simon Haykins

There can be surprise test based on this assignment