Exercise Set #1

1. For each of the following codes, determine if it is non-singular, uniquely decodable, or instantaneous.

   (a) \{01, 10\}
   (b) \{0, 01, 10\}
   (c) \{0, 10, 11\}
   (d) \{110, 11, 100, 00, 01\}

2. Consider a source which produces an i.i.d. sequence of symbols from the alphabet \{A, B, C\} with probabilities \{0.5, 0.25, 0.25\} respectively. For \(n = 1, 2,\) and \(3\), find binary Huffman codes for taking \(n\) source symbols at a time. In each case compute the average number of binary code symbols per source symbol and compare the results.

3. Repeat Problem 2 with probabilities \{0.4, 0.35, 0.25\}. 
