Worksheet:
Coding Applications

1. A communication system consists of 78 symbols. Determine the minimum number of bits, using fixed length codes needed to communicate the symbols.

2. The communication system is using 38kilo-baud transmission rate. Determine the number of bits per second required to transmit the above data.

3. Estimate the Entropy for the communication system, assuming each symbol is equally likely.

4. Determine the redundancy, given the coding scheme.

5. A number of single bit errors occur during the transmission. What block coding scheme could be used to identify and correct for the errors? What is the effect on the redundancy.*Hint:* As well as the obvious comparison, ie with and without the block coding, the redundancy of the given communication system with the additional control bits can also be considered.

6. Assuming the block coding is able to correct all errors in the transmission and the same baud rate is maintained, what data rate in bps would be needed to ensure the same number of data bits arrive at the receiver.

7. What is the minimum bandwidth required to transmit this data, with the block coding at the calculated data rate for a channel with a SNR of 28dB?