

B. Huffman Encoding:

The Huffman encoding procedure is as follows:

1. List the source symbols in order of decreasing probability.
2. Combine the probabilities of the two symbols having the lowest probabilities, and reorder the resultant probabilities; this step is called reduction 1. The same procedure is repeated until there are two ordered probabilities remaining.
3. Start encoding with the last reduction, which consists of exactly two ordered probabilities. Assign 0 as the first digit in the code words for all the source symbols associated with the first probability; assign 1 to the second probability.
4. Now go back and assign 0 and 1 to the second digit for the two probabilities that were combined in the previous reduction step, retaining all assignments made in Step 3.
5. Keep regressing this way until the first column is reached.

B. Huffman Encoding:

- (Implementation on overhead)
- The underlying entropy is 2.36 b.
- The codeword lengths are the same as for Shannon Fano Coding. So the average code length $E(L)$ and the efficiency η as the same also.
- In general, Huffman encoding results in an optimum code. Thus, it is the code that has the highest efficiency.