Algorithm for Constructing a Huffman Code

Step 1: Search the list of probabilities for the two levels with the lowest probabilities. In our example, these are levels 7 and 8 with probabilities 0.04 and 0, respectively.

Step 2: Add the two lowest probabilities together. Form a new list that includes all the probabilities not affected in Step 1, plus the sum generated there. The new list has one less element.

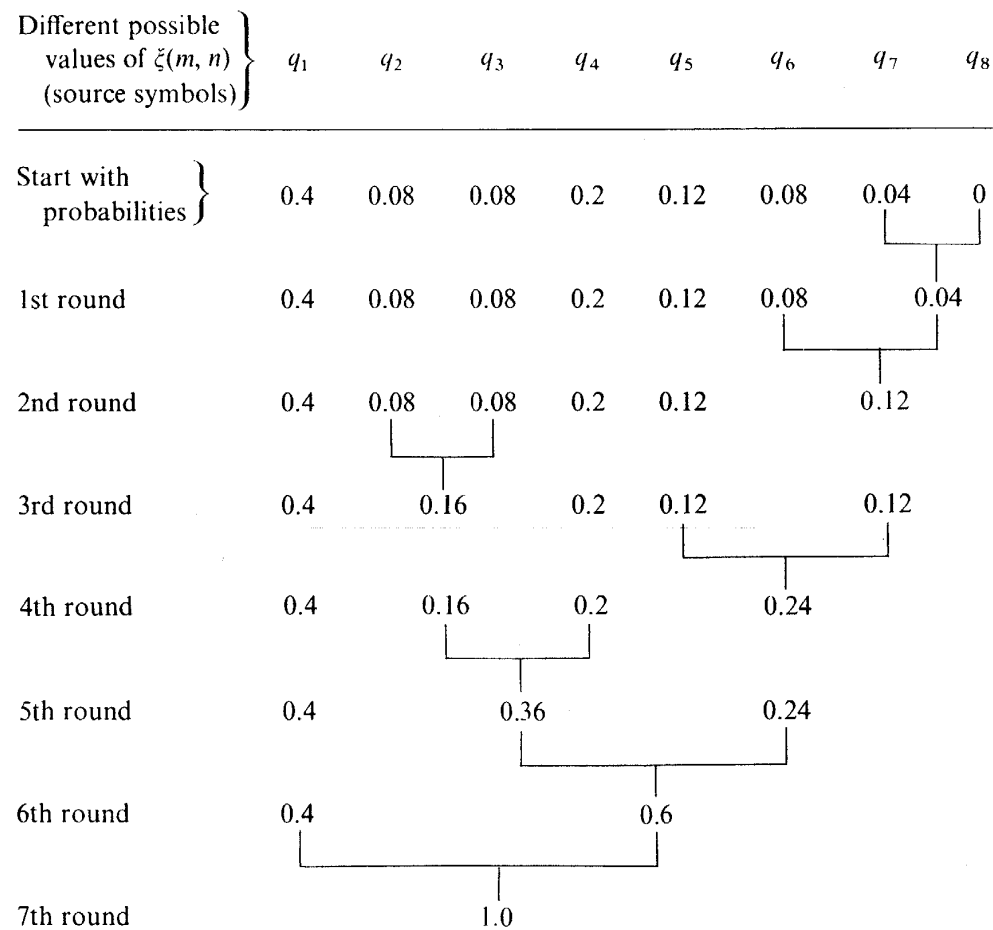Step 3: Go back to Step 1 and repeat the procedure until the list contains only one element.

Different possible values of $\xi(m, n)$ (source symbols)	q_1	q_2	q_3	q_4	q_5	q_6	q_7	q_8
Start with probabilities	0.4	0.08	0.08	0.2	0.12	0.08	0.04	0
1st round	0.4	0.08	0.08	0.2	0.12	0.08	0.04	
2nd round	0.4	0.08	0.08	0.2	0.12		0.12	
3rd round	0.4	0.16		0.2	0.12		0.12	
4th round	0.4	0.16		0.2		0.24		
5th round	0.4	0.36				0.24		
6th round	0.4		0.6					
7th round		1.0						

Fig. 25 Building the tree for the Huffman code.

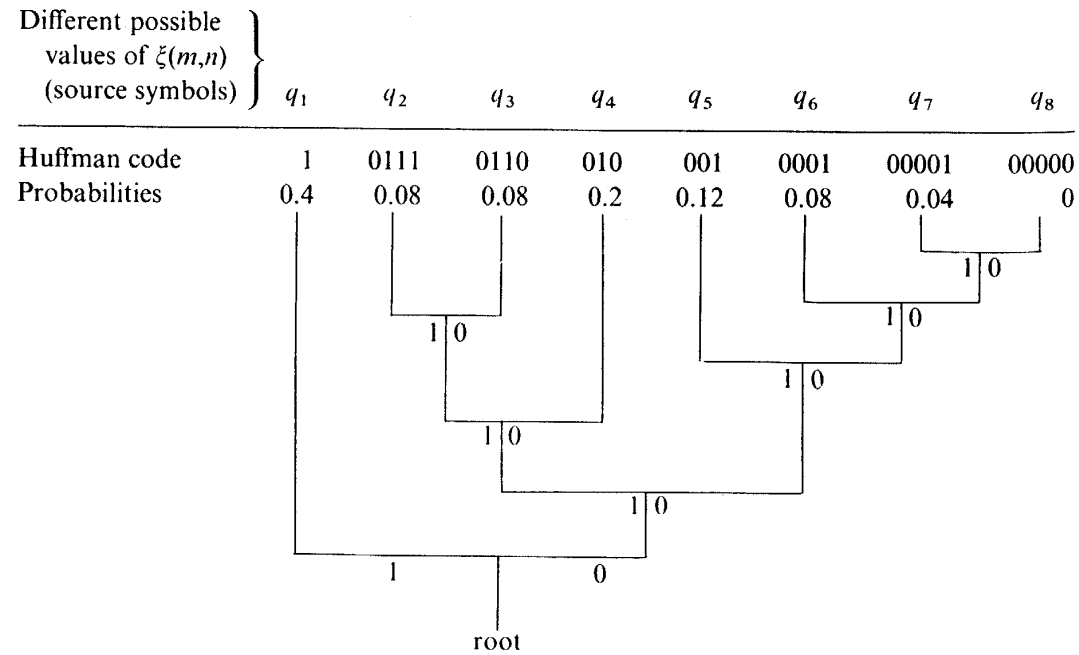| Different possible values of $\xi(m,n)$ (source symbols)	q_1	q_2	q_3	q_4	q_5	q_6	q_7	q_8
Huffman code	1	0111	0110	010	001	0001	00001	00000
Probabilities	0.4	0.08	0.08	0.2	0.12	0.08	0.04	0

Fig. 26 The tree generated in Fig. 25 is shown here more clearly. This tree is used for determining the code words for the source symbols.