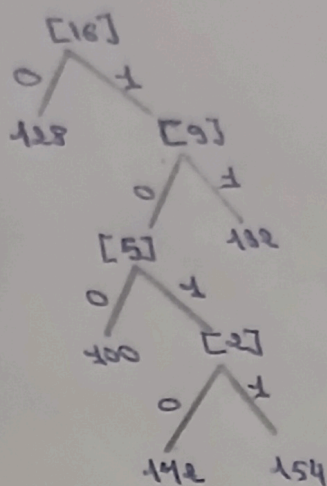


# Exercise 43

1.

128	7/16	0	1
132	4/16	11	2
133	3/16	100	3
142	1/16	1010	4
154	1/16	1011	4



0	11	0	11
1011	0	11	0
100	100	0	0
100	1010	0	11

2. Entropic:

$$H(x) = - \left[ \frac{7}{16} \times \log_2 \left( \frac{7}{16} \right) + \frac{4}{16} \times \log_2 \left( \frac{4}{16} \right) + \frac{3}{16} \times \log_2 \left( \frac{3}{16} \right) + 2 \times \frac{1}{16} \times \log_2 \left( \frac{1}{16} \right) \right]$$

$$H(x) = 1,9375 \text{ bits/pixel}$$

$$L = \left( \frac{7}{16} \times 1 + \frac{4}{16} \times 2 + \frac{3}{16} \times 3 + \frac{1}{16} \times 4 + \frac{1}{16} \times 4 \right) = \left( \frac{7}{16} + \frac{8}{16} + \frac{9}{16} + \frac{4}{16} + \frac{4}{16} \right) = \frac{32}{16} = 2 \text{ bits/pixel}$$

$$\text{Efficiency} = \frac{H(x)}{L} = \frac{1,9375}{2} = 96,875\%$$