1. Lembel-Ziv coding
2. Source coding ($M = 2, 3$)

Cyclic code : GF Field

$\{0, 1, 2\}$ ($M = 3$)

16. Apply the Shannon Fanon coding procedure and find code efficiency

[x]=	x1	x2	x3	x4	x5	x6
[p]=	0.30	0.25	0.20	0.12	0.08	0.05

Nos. of discrete symbol to code

$M=2$ $\{0, 1\}$

$M=3$ $\{-1, 0, 1\}$ $\{\bar{1}, 0, 1\}$ → $\{0, 1, 2\}$

x_i	p			code	n_i
x_1	0.30	0		0	1
x_2	0.25	1	0	10	2
x_3	0.20	1	1	11	2
x_4	0.12	2	0	20	2
x_5	0.08	2	1	21	2
x_6	0.05	2	2	22	2

0.30 | 0.25 | 0.45

x_i	p				code	n_i
x_1	0.30	0			0	1
x_2	0.25	1			1	1
x_3	0.20	2	0		20	2
x_4	0.12	2	1		21	2
x_5	0.08	2	2	0	220	3
x_6	0.05	2	2	1	221	3

$M=2$ Binary code

$M=3$ ternary code

(a) 0.20 | 0.12 | 0.13 ✓ × (c) 0.32 | 0.08 | 0.05

× (b) 0.20 | 0.20 | 0.05

Avg length per symbol $\bar{L} = \sum p_i n_i$

Entropy $H = -\sum p_i \log_2 p_i = -\frac{1}{\log_{10} 2} \sum p_i \log_{10} p_i$ ✓

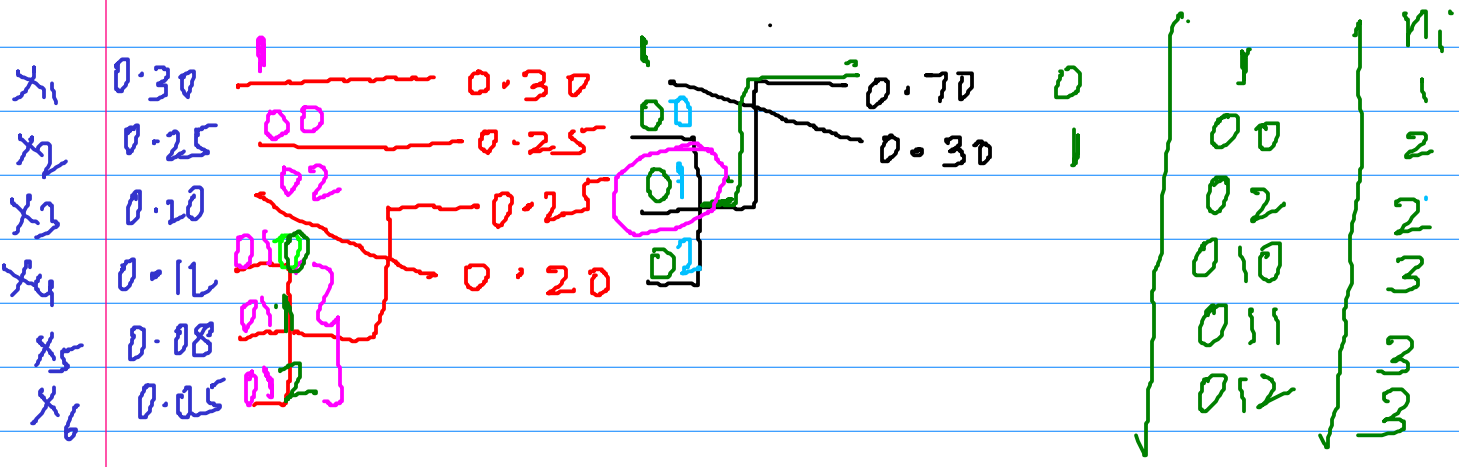
$$\eta = \frac{H}{\bar{L} \log_2 M} \times 100 = \frac{H}{\bar{L} \log_2 3} \times 100 =$$

Huffman

16. Apply the ~~Shannon Fanon~~ coding procedure and find code efficiency.

[x]=	x1	x2	x3	x4	x5	x6
[p]=	0.30	0.25	0.20	0.12	0.08	0.05

M=3



$$\bar{L} = \sum p_i n_i$$

$$H = -\sum p_i \log_2 p_i$$

$$\eta = \frac{H}{\bar{L}\log_2 M} \times 100 =$$