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4. $$\begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

a. Row echelon form... $R_2 \to R_2 + R_1$

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

$x_1 = x_4 + x_5 + x_6 = x_4 + x_2 = x_4 + x_3$

$x_2 = x_5 + x_6$

$x_3 = x_5 + x_6 = x_2$

x_4	x_5	x_6	x_1	x_2	x_3
0	0	0	0	0	0
0	0	1	1	1	1
0	1	0	1	1	1
0	1	1	0	0	0
1	0	0	1	0	0
1	0	1	0	1	1
1	1	0	0	1	1
1	1	1	1	0	0

Independent

Code words: $\{000000, 111001, 111010, 000011, 100100, 011101, 011110, 100111\}$

b. Minimum distance is the codeword with least amount of 1s (excluding 0)

$\to 000011$

$\to \delta = 2$