Problem.
Let $V$ be a binary linear code given by the parity check matrix

$$H = \begin{pmatrix}
0 & 0 & 0 & 1 & 1 & 1 & 0 \\
0 & 1 & 1 & 0 & 1 & 1 & 0 \\
1 & 0 & 1 & 0 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 1 & 1
\end{pmatrix}$$

a) Use $H$ to construct a maximal likelihood an error/syndrome table without constructing the standard array.

b) Demonstrate how your error/syndrome table can be used to decode the received vector $r = 1101\ 1010$.

a) Find a generator matrix $G$ of $V$.

d) Use the generator matrix to create a list of all code vectors of $V$. Then use this list to determine the minimum distance $d$ of $V$.

e) What is the length $n$ of this code?

f) What is the dimension $k$ of this code?

e) What is the name of this famous code?