

Ambiguity in Codes

Fernando Guzmán

Binghamton University

`fer@math.binghamton.edu`

The code $C = \{a, b, c, d\}$ where:

$$a = 1 \ 1 \ 0$$

$$b = 1 \ 1 \ 0 \ 1 \ 1$$

$$c = 1 \ 0 \ 1$$

$$d = 0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1$$

is an MSD code but it is not UD. It satisfies the relation $abcd = bdac$ as we can see in:

$$\begin{array}{cccc}
 a & b & c & d \\
 \hline
 \underbrace{1 \ 1 \ 0 \ 1 \ 1 \ 0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1}_{\substack{b & d & a & c}}
 \end{array}$$

and any other relation it satisfies is a consequence of this one. This code was introduced by Lempel in 1986, as the first known example of a proper MSD code.

